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Wight Barfleur Reef and Bassurelle Sandbank SAC Management Survey

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1 Background and Introduction

1.1 Survey Project Team

The surveys at Wight Barfleur Reef and Bassurelle Sandbank candidate Special Area(s) of Conservation (cSAC) were carried out onboard the Research Vessel Cefas Endeavour (Cruise code CEND0313) between the 18th March and the 1st April 2013. The survey team for the duration of the fieldwork included Cefas marine scientists and surveyors, marine monitoring specialists from the JNCC and a marine surveyor from EGS (see below).

Cefas-Marine Ecologist
Cefas-Marine Ecologist
Cefas-Marine Surveyor
Cefas Sedimentologist
Cefas-Planktologist
Cefas-Marine Surveyor
Cefas-Marine Policy
Cefas-Fisheries Scientist
Cefas-Marine Policy
Cefas-Planktologist
Cefas Marine Engineer
Cefas-Marine Scientist
JNCC-Marine Monitoring
JNCC-Marine Monitoring
JNCC-Marine Monitoring
EGS-Marine Surveyor

1.2 Site Description: Wight Barfleur Reef cSAC

Link to candidate Special Area of Conservation (cSAC) Selection Assessment Document: http://jncc.defra.gov.uk/pdf/WightBarfleur_SelectionAssessmentDocument_V5_0.pdf

Further info: https://sac.jncc.gov.uk/site/UK0030380

Wight-Barfleur Reef (Figure 1) is an area of bedrock and stony reef located in the central English Channel, between St Catherine's point on the Isle of Wight and Barfleur Point on the Cotentin Peninsula in northern France. The cSAC is approximately 65km long (east to west) and up to 26km wide. The depth within the SAC ranges from 25m to 100m, with the deepest areas to the south, and within the palaeovalley which runs along the south-east part of the SAC.

The large area of bedrock reef within the cSAC is characterised by a series of well-defined exposed bedrock ridges. The southern area of the site is composed of flat, smooth mudstone and sandstone, with overlying coarse sediment (gravels, cobbles and boulders) which in places forms stony reef. The south-eastern area of the site is characterised by a large palaeochannel known as the Northern Palaeovalley which forms a major channel running approximately north-east/south-west across the English Channel. Within the cSAC the palaeovalley remains largely unfilled by sediment due to the strong currents in the area, and is characterised by a gravel, cobble and boulder substrate which in places forms stony reef.

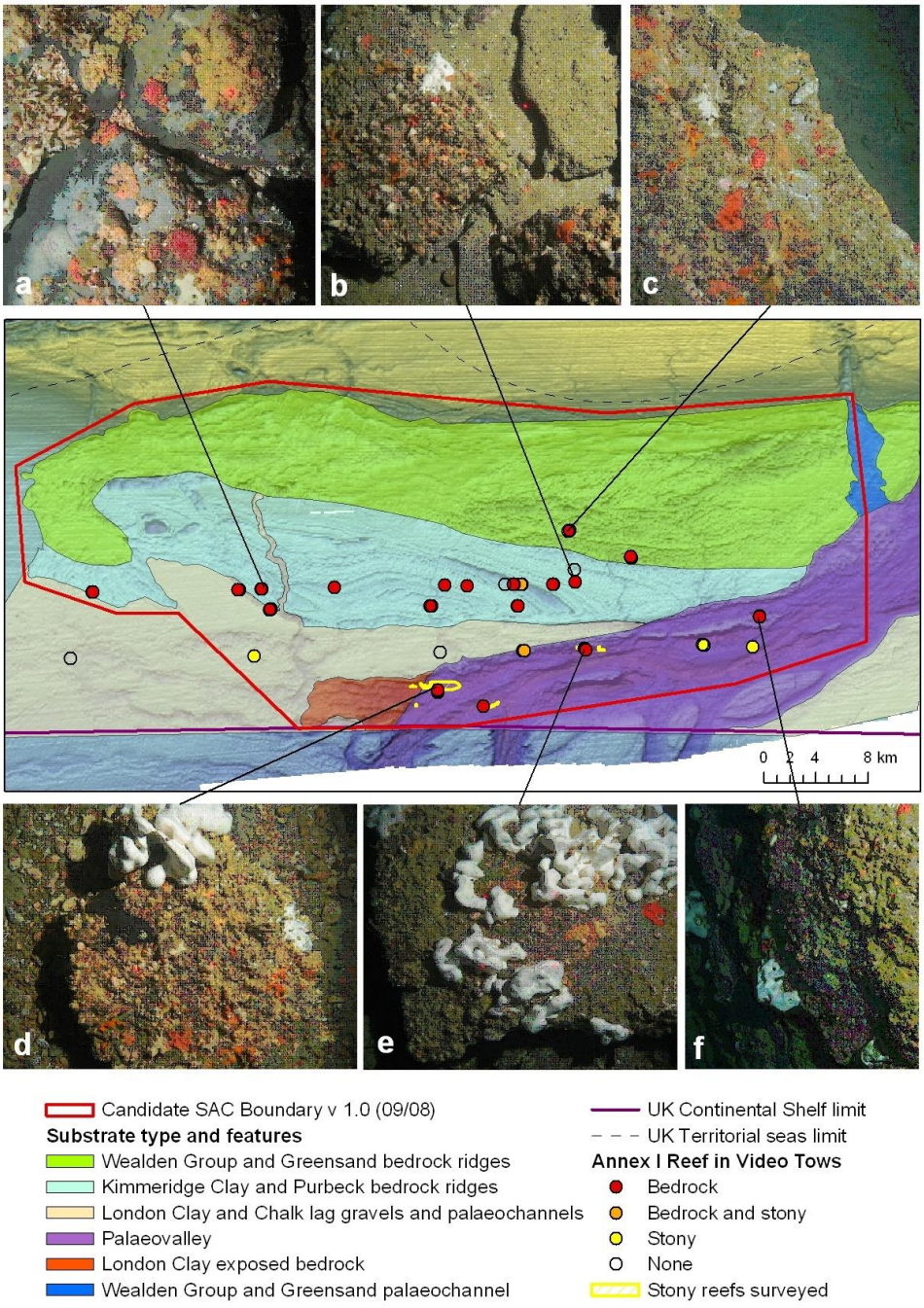


Figure 1. Map showing location of different rock types within SAC boundary and observed records of Annex I reef and example images from video tows conducted within each area.

1.3 Site Description Bassurelle Sandbank cSAC

Link to cSAC Selection Assessment Document:
http://jncc.defra.gov.uk/pdf/BassurelleSandbank_SACSAD_4.0.pdf

Further info: https://sac.jncc.gov.uk/site/UK0030368

The Bassurelle Bank (Figure 2) is a linear sandbank in the Dover Strait which straddles the boundary between UK and French waters. It is an example of an open shelf ridge sandbank thought to be formed by tidal currents. The part of the sandbank within UK waters is

approximately 2.5km at its widest point and has a maximum height of approximately 15m. It extends approximately 15km in a northeast-southwest direction to the UK-France median line, and then continues for some distance into French waters.

The sandbank is mainly composed of very well sorted sand with some gravelly sand, with occasional shell patches. The surface tidal currents along the bank are weak to moderately strong (peak spring surface current velocity of 0.7m/s). Sand waves and mega-ripples are abundant on parts of the bank and are up to 2.5m in height. Biological communities present are typical of sandy sediments and are therefore dominated by polychaete worms such as the tube-worm *Lagis koreni* and the bristleworm *Spiophanes bombyx*.

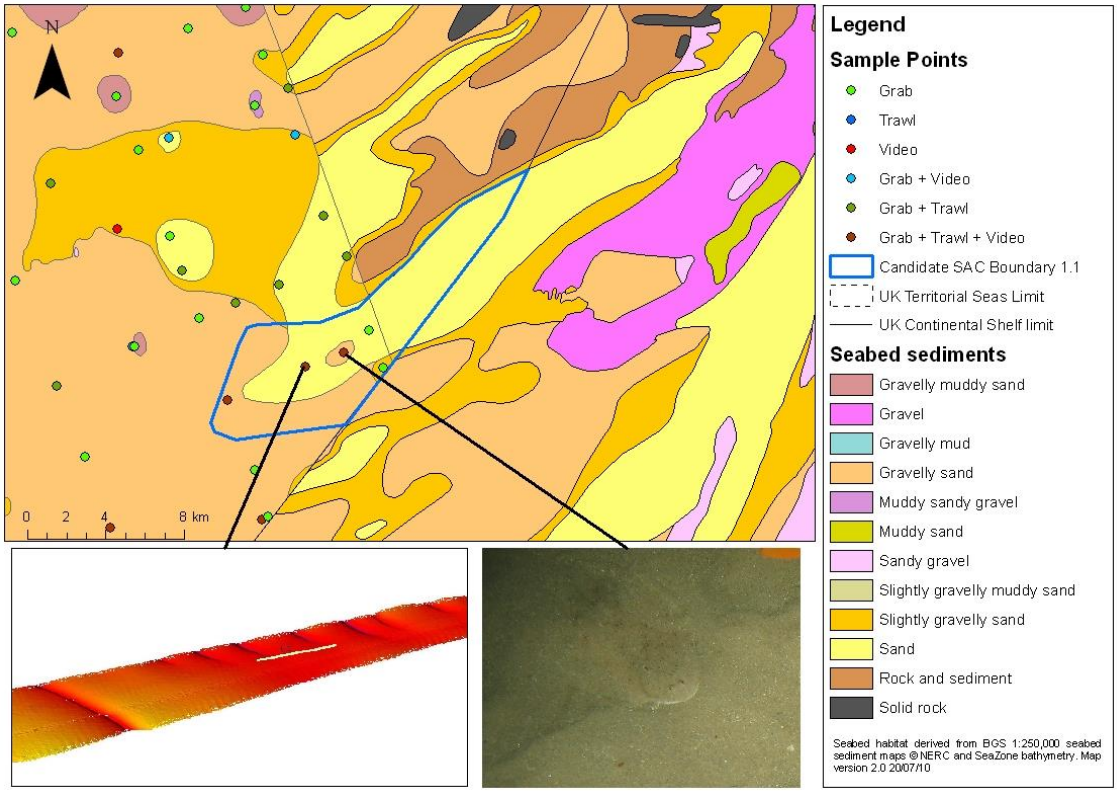


Figure 2. Data used for habitat characterisation (sediment type and biological community) within the Bassurelle Bank site boundary.

1.4 Existing data and information utilised to inform survey planning

1.4.1 Wight Barfleur Reef

The United Kingdom Hydrography Office (UKHO) Digital Survey Bathymetry data was available for an extensive part of the central English Channel. This data clearly identified bedform features, and was used, in combination with rock samples and seismic data, to delineate areas of different rock type. Information from a Defra funded project, "Broadscale mapping of hard substrates in the central English Channel," led by CEFAS with JNCC as project partners was also utilised in the planning of this survey. This project included two multi-disciplinary surveys of the central English Channel which were conducted in summer 2006, both on the RV Cefas Endeavour. During these two surveys, multi-beam and side-scan data was acquired along a series of survey corridors (spaced 4-5km apart) to gain a broad overview of the area. In addition, more detailed surveys (100% side-scan and/or 100% multi-beam coverage) were carried out over four discrete areas which targeted specific

features of interest. Biological data in the form of video tows, grab samples and beam trawls were also obtained from specific features of interest. These data were analysed and integrated into the current survey design.

1.4.2 Bassurelle Sandbank

Several recent benthic grab stations included as part of a joint Cefas/JNCC fishing pressure study were assessed and taken into account during the planning of this survey. Some acoustic corridor data were also available and utilised in the planning phases of this survey.

2 Survey Design and Methods

2.1 Wight Barfleur Reef cSAC

2.1.1 Survey aims

The aim of this survey was to collect additional seabed data to assist with the development of management advice in relation to Wight Barfleur Reef cSAC. The main priority of the survey at Wight Barfleur Reef cSAC was to better delineate the extent of Annex I reef (both bedrock and stony), i.e. transitional boundaries between coarse/mixed sediments to the northern and western areas of the cSAC, especially in areas where fishing activity had been identified within and around the site. In addition, further evidence (side-scan and multi-beam acoustic data, underwater video footage and still images and benthic grab data) was required from within the paleovalley situated in the southern section of the cSAC to enable the distribution of sedimentary and reef habitats to be understood.

2.1.2 Survey plan

A 5km spaced survey grid was placed over the site and orientated in line with existing acoustic and ground truthing data collected within the Wight Barfleur Reef cSAC (Figure 3). It was proposed to carry out underwater video tows using a drop camera frame and to deploy a 0.1m^2 Hamon grab to collect benthic sediments (ground types permitting) at each ground truthing station.

It was planned to collect opportunistic multi-beam acoustic data during transits between ground truthing stations. Five acoustic survey boxes were planned and placed in areas of interest within the Wight Barfleur Reef cSAC. It was proposed to acquire 100% Side-scan and 50% Multi-beam coverage at each of the survey boxes. Additional ground truthing stations would then be planned based on the acoustic data collected.

The deployment of the 0.25m^2 Hamon grab and/or the rock dredge would be considered to acquire qualitative samples of cobble communities and sponge specimens. This would again be dependent on ground types observed during underwater video deployments.

2.2 Bassurelle Sandbank cSAC

2.2.1 Survey aims

The main aim of the survey was to collect additional information (acoustic data, underwater video footage and still images and benthic grab data) from the site to increase current knowledge of the distribution and heterogeneity of benthic habitats and communities present across the sandbank to assist the development of future management advice/plans.

2.2.2 Survey plan

The Bassurelle site was split into two boxes, Box A and Box B (Figure 4). It was proposed to collect acoustic data (side-scan and multi-beam) across each of the two survey boxes. A ground truthing programme based on a 1km grid using a HamCam (0.1m^2 Hamon grab fitted with an underwater video camera) and a camera sledge would then be carried out.

Underwater camera stations were stratified by depth and selected to ensure that there was adequate distribution of camera stations across both survey boxes. The deployment of the Jennings 2-meter scientific beam trawl was completed in addition to collect qualitative information on epi-faunal communities present within the site.

2.3 Sample collection and processing methods

2.3.1 Sediment and biological samples

Sedimentary habitats were groundtruthed using a Hamon grab (0.25m^2) and mini Hamon grab (0.1m^2). The larger of the two Hamon grabs was primarily used (Wight Barfleur cSAC only) to collect cobble and sponge samples. The mini Hamon grab was used to collect benthic sediments for particle size and faunal analysis (Figure 5).

On recovery of the 0.25m^2 Hamon grab any sponges present were removed from the cobbles and preserved in IMS solution. The remaining cobbles were preserved using 4% buffered formaldehyde solution for transport back to the laboratory.

On recovery of the 0.1m^2 mini Hamon grab, the grab sample was decanted into a suitable container. A representative sub-sample of sediment (approx. 0.5 litres) was taken for Particle Size Analysis (PSA). The whole sample was photographed and the volume measured and recorded. The faunal sample was then washed over a 1mm sieve and the >1mm fraction transferred into a sample container. Photographs were taken of the sediment fraction retained on both the 1mm and 5mm sieves. The sample was fixed and preserved using a 4% buffered formalin solution for transport back to the laboratory.

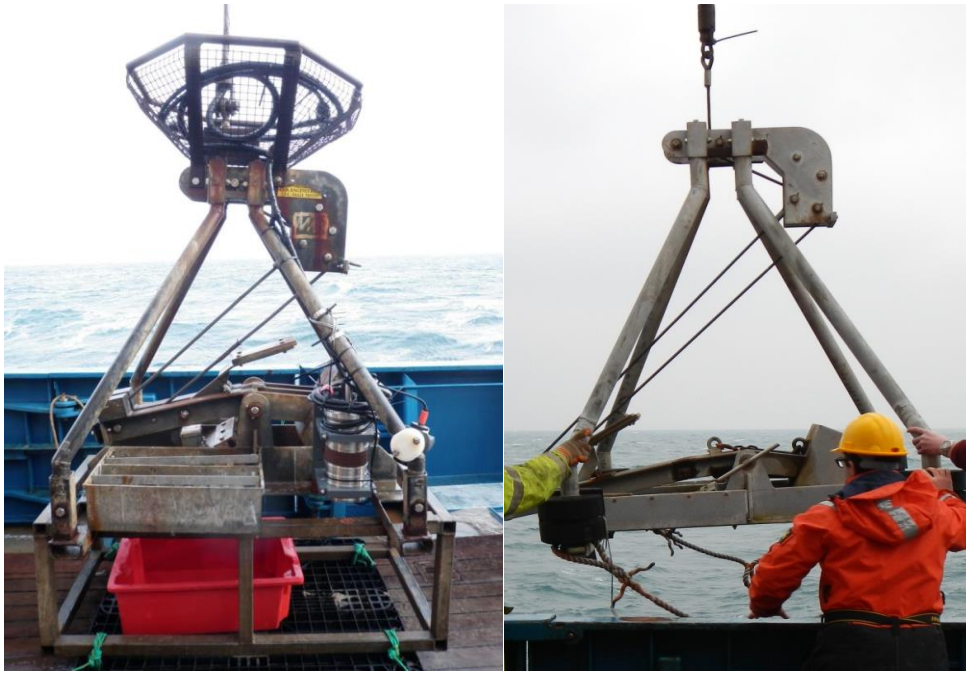


Figure 3. 0.1m^2 Hamon grab with video camera fitted and the 0.25m^2 Hamon grab which was used to collect cobbles.

2.3.2 Epibenthic samples

Epibenthic species found on sedimentary habitats were sampled using the Jennings 2-metre beam trawl. The trawl was towed at ~1.5 knots for five minutes. The sample was washed over a 5mm sieve before all species were identified, enumerated and weighed (Figure 6).

Figure 4. 2m Jennings beam trawl used to collect epibenthic specimens.

2.3.3 Underwater video and photographic imaging techniques

Set-up and operation followed the MESH 'Recommended Operating Guidelines (ROG) for underwater video and photographic imaging techniques'. Video was recorded simultaneously to a Sony GV-HD700 DV tape recorder and a computer hard drive. A video overlay was used to provide station metadata, time and GPS position (of the vessel) in the recorded video image.

Camera deployment lasted a minimum of 10 minutes and were run at ~0.5 knots (~0.25ms^{-1}) across a 200m 'bullring' centred on the sampling station or along a specific transect. Stills images were captured at regular one-minute intervals and opportunistically if specific features of interest were encountered.

2.3.4 Camera sledge

Sedimentary habitats were assessed using a camera sledge. The camera sledge system comprised of a video camera capable of also capturing still images (Figure 7). Illumination was provided by underwater lights and a flash unit. The camera was fitted with a four-spot laser-scaling device to provide a reference scale in the video image. The sledge was controlled by a winch operator with sight of the video monitor and note made of the amount of tow cable deployed to allow a 'lay back' to be applied to estimate the distance of the sledge behind the vessel. USBL positioning was also used to accurately log the position of the camera sledge on the seabed during each deployment.

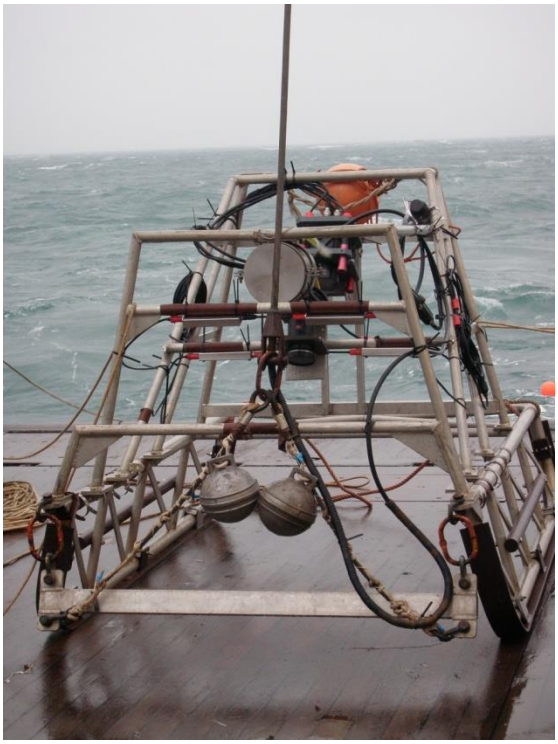


Figure 5. Camera sledge with video and still imaging system.

2.3.5 Drop video camera

Reef habitat and mixed sediments were assessed using a drop video camera with the same configuration as used on the sledge. The drop frame height was controlled via a winch operator in sight of the video feed and note made of the amount of tow cable deployed to allow a 'lay back' to be applied to estimate the distance the drop camera frame was away from the vessel. USBL positioning was used in addition to the starboard gantry offset to accurately log the position of the drop video camera during each deployment (Figure 8).

Figure 6. Drop camera frame fitted with video and still imaging system.

2.4 Geophysical data acquisition

2.4.1 Side-scan sonar

An Edgetech FS-4200 dual frequency (300/600kHz) side-scan sonar was used in combination with the Edgetech Discovery software for data recording. Data were recorded in XTF format and post-processed using the Triton Imaging software suite (Isis and TritonMap).

2.4.2 Multi-beam echosounder

Data were collected using a Kongsberg EM2040 multi-beam echosounder. Bathymetry data were processed using Caris HIPS and backscatter data were produced with the QPS FMGT software package.

3 Survey Narrative

3.1 Wight Barfleur Reef cSAC

Survey work commenced at the Wight Barfleur Reef candidate Special Area of Conservation (cSAC) at 15:00 on 18/03/13 with a Sound velocity Profile (SVP) cast, after which a partial calibration on the multi-beam (MB) system was conducted. On completion of the calibration exercise a drop camera (DC) deployment was carried out at station HP03 (21:00, 18/03/13). Cefas Endeavour then transited east to Box_1 to conduct a 100% MB and side-scan sonar (SS) acoustic survey (22:30). On completion of the acoustic MB and SS survey (12:30, 19/03/13) 12 DC deployments (HP07, MP02, MP04, MP06, MP09, MP12, MP15, MP18, MP21, MP26, MP30) and one 0.1m^{2}Hamon grab (HG) deployment was carried out.

Preliminary assessment of the video tows during the deployments identified Annex 1 stony reef at nine of the stations (MP04, MP06, MP09, MP12, MP18, MP21, MP26, MP30 and MP33). Multi-beam data was collected opportunistically during transits between all ground truthing stations.

In an attempt to prevent gaps in the acoustic record and to provide some acoustic data over the pending ground truthing station Cefas Endeavour travelled through the ground truth station before taking up a position suitable for DC or HG deployment. The onboard OLEX system was used to initially assess the acoustic data. If a feature of interest was noted in the vicinity of the planned station the station was either moved or a specific run-line was generated for the ship to follow. While the ground truthing survey was being carried out the acoustic data (MB and SS) collected from Box_1 was processed.

The ground truthing survey continued across the site throughout 20/03/13 with a further 18 stations being surveyed of which seven were thought to be representative of Annex 1 stony reef (HP51, HP49, HP39, HP35, HP33, HP31 and HP04). Five 0.1m^2 Hamon grab samples were also collected from suitable ground types at stations HP45, HP43, HP39, HP37 and HP22 (23:40, 20/03/13). During this phase of the survey the camera system failed twice (15:30 and 21:00, 20/03/13) resulting in two Kongsberg OE14-408 camera and flash units being replaced with the older Kongsberg OE14-208 camera and flash unit. A further 10 drop camera stations were completed, two of which (MP05 and MP07) were noted as containing reef and stony reef respectively before a 100% SS and 50% MB survey of nested survey Box-2 began. Prior to the start of the survey an SVP cast was carried out (15:00, 21/03/13). On completion of the acoustic survey of nested survey Box_2 (23:15, 21/03/13) a further SVP cast was carried out before surveying of planned ground truthing stations resumed

(23:45, 21/03/13). During the acoustic survey of nested survey Box_2 the weather began to deteriorate with strong east-northeast winds and a worsening sea state.

During the acoustic surveys of the nested survey boxes and transits between planned stations additional ground truthing stations were planned. These were based on acoustic data collected and processed during the current survey. The additional ground truthing stations were focussed on reef features, seabed bedforms and varying sediment signatures acquired through SS and MB backscatter data. Additional sample stations were also selected to acquire samples of sponges and encrusting species using the 0.25m^2 HG.

Drop camera and 0.25m^2 HG deployments continued 08:10, 22/03/13 and included stations HP31a and HP28a where several sponge specimens where collected. At 09:30 a further SVP cast was carried out before carrying out a 100% SS and 50% MB survey at nested survey Box_3. This acoustic survey was hampered by strong winds and a worsening sea state which resulted in data only being collected in one direction. The acoustic survey of nested survey Box_3 was completed at 00:00, 22/03/13. Sea conditions were deemed to be too rough to recommence DC and HG deployments so Cefas Endeavour transited south to begin a 100% SS and 50% MB acoustic survey of nested survey Box_4. On arrival a SVP cast was carried out prior to starting the survey (06:42, 23/03/13). At 08:30 with Box_4 only 50% completed the weather had improved sufficiently to allow the resumption of the ground truthing programme. Fourteen drop cameras, three 0.1m^2 Hamon grabs and one 0.25m^2 Hamon grab, aimed at collecting further sponge and encrusting species specimens, were completed (23:00, 23/03/13).

During the period of bad weather a Cefas scientist had become very unwell due to sea sickness. It was decided to return to Portland to allow the scientists to disembark the vessel. Before leaving the site two further DC and one 0.1m^2 HG deployment were carried out (02:00, 24/03/13). Cefas Endeavour docked in Portland at 07:00, 24/03/13 and remained alongside until 12:30 before transiting back to Wight Barfleur Reef cSAC. On arrival (15:20, 24/03/13) a SVP cast was carried out before the ground truthing programme resumed. Eight drop camera deployments were carried out at additional ground truthing stations which had been positioned on route to and within nested survey Box_3 using acoustic data collected earlier in the survey. Possible Annex 1 reef was noted at 4 of the stations (AddGT16Box3, AddGT17Box3, AddGT07 and AddGT06 (23:09, 24/03/13).

The ground truthing programme continued until 16:30, 25/03/13 with a further fourteen drop camera deployments and two 0.25m^2 HG deployments. An SVP cast was then carried out prior to completing the acoustic survey at nested survey Box_4. During the survey of nested survey Box_4 pair trawlers were observed fishing within the southern boundary of the Wight Barfleur Reef cSAC. On completion of the acoustic survey in nested survey Box_4 a further seven DC deployments were carried out before a further SVP cast was carried out prior to beginning a 100% SS and 50% MB acoustic survey at nested survey Box_5 (05:30, 27/03/13). On completion of the acoustic survey within nested survey Box_5 the remaining planned and additional ground truthing stations were surveyed using the DC. Before leaving the site a second partial MB calibration was carried out over a known wreck. This additional MB calibration was conducted because of the need to raise the scientific instrument blade up from 3.3 meters to 1 meter due to perceived water depth restrictions at Bassurelle Sandbank cSAC. Cefas Endeavour began transiting in an easterly direction to the Bassurelle Sandbank cSAC (20:30, 27/03/13).

During the last three days of the survey at Wight Barfleur Reef very strong tides, in excess of three knots, began to hamper the ground truthing process.

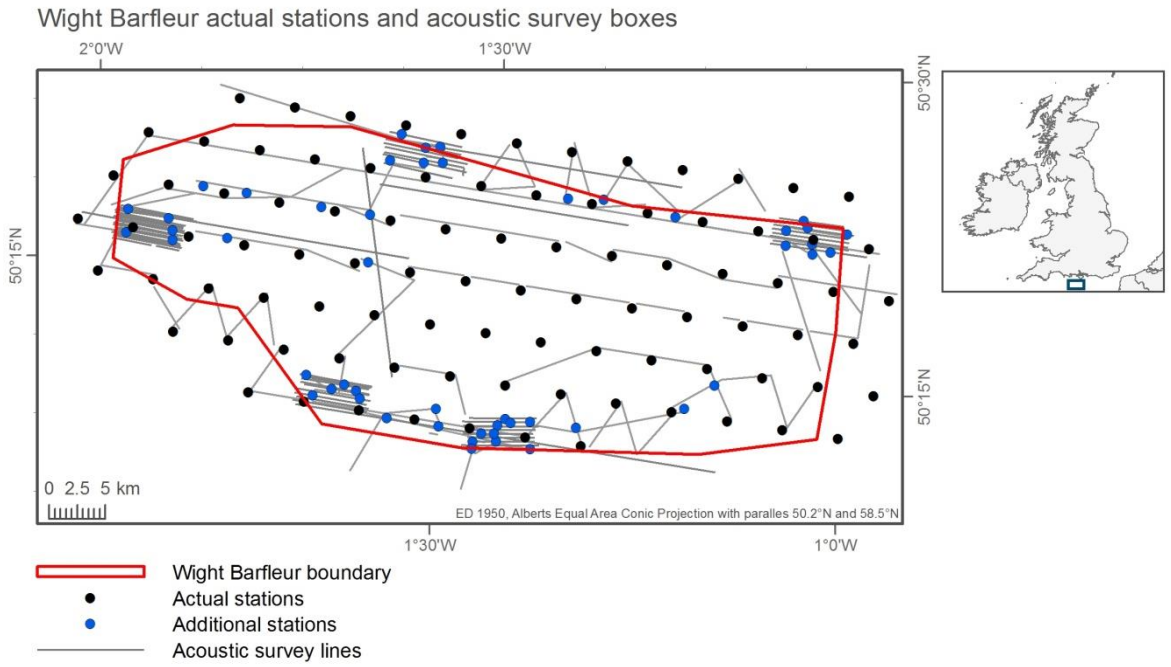


Figure 7. Completed survey at Wight Barfleur cSAC.

3.2 Bassurelle Sandbank cSAC

Cefas Endeavour arrived at Bassurelle Sandbank cSAC at 03:30, 28/03/13. On arrival an SVP cast was carried out before a partial coverage SS and MB acoustic survey over Box A commenced (04:15, 28/03/13). During the acoustic survey additional ground truthing stations were planned over the shallower areas within survey Box_B. The ground truthing survey using the HamCam (HC) and camera sledge (CS) continued at this site and was completed 30/03/13. On completion of the ground truthing survey in Box_A Cefas Endeavour transited to Box_B to begin the ground truthing survey. The deployment of the HC and CS continued until high tide (13:00. 30/03/13) when it was deemed safe to commence the planned acoustic survey over the shallower parts of the site. On completion of the acoustic survey and the remaining ground truthing stations within Box_B Cefas Endeavour retuned to Box_A to carry out additional ground truthing stations and three 2 metre Jennings beam trawls (at existing survey stations EECMHM 2006). On completion of these stations Cefas Endeavour returned to Box_B to infill the existing acoustic survey to ensure there was adequate coverage over existing ground truthing stations. On completion of this task (01:00 01/04/13) Cefas Endeavour transited back to Lowestoft, docking at (13:00, 01/04/13).

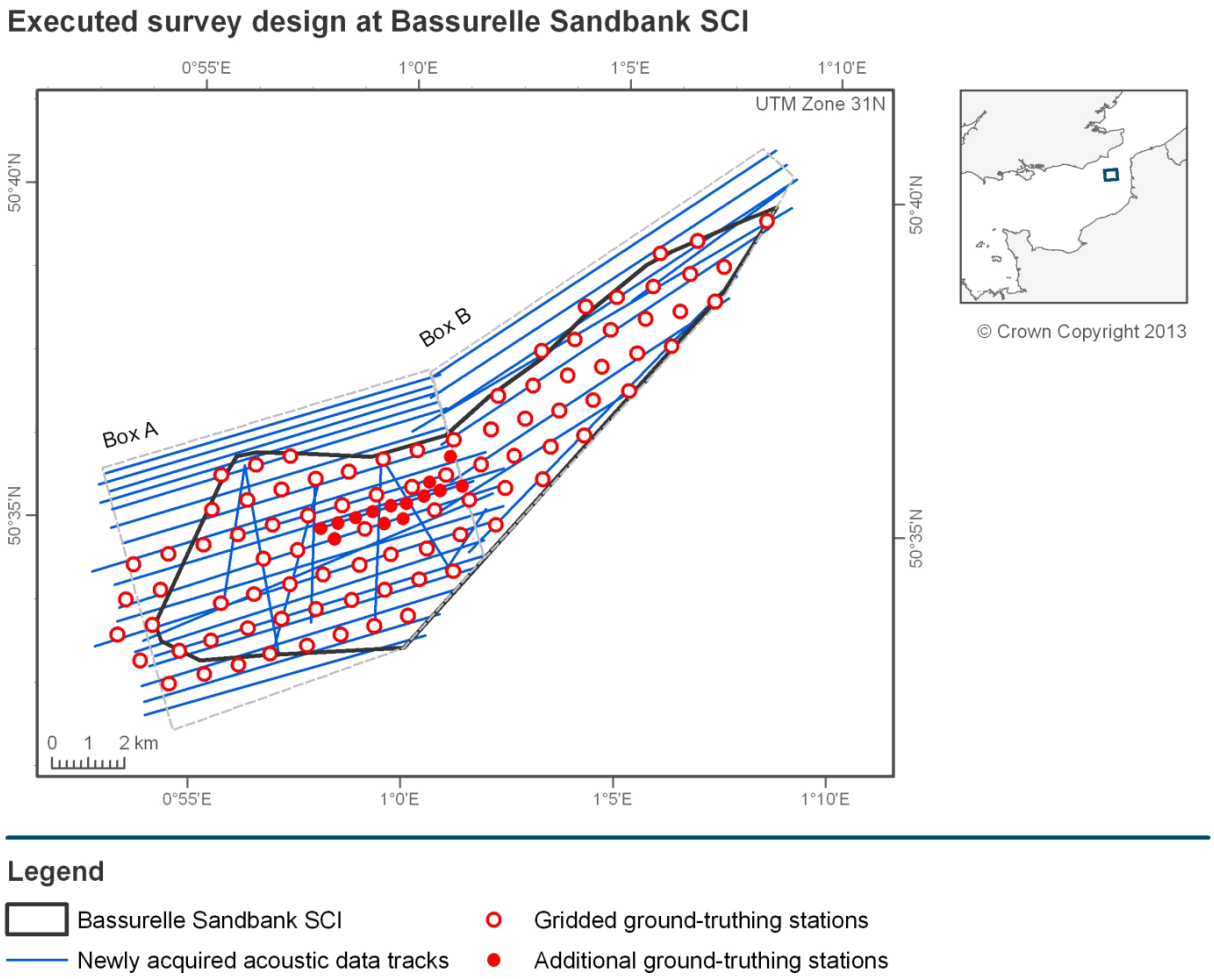


Figure 8. Completed survey at Bassurelle Sandbank cSAC.

4 Preliminary Results

4.1 Wight Barfleur Reef

4.1.1 The collection of sponge and cobble community specimens

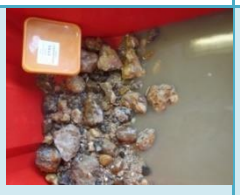
Specimens of sponge and cobble encrusting communities were successfully collected from five stations within the Wight Barfleur Reef cSAC (ADDGT15, WBRFHP30, WBRFMP17, WBRFHP31 and ADDGT09. Seventeen Hamon grabs were collected and processed for sediment and infaunal communities (Table 1).

4.1.2 Benthic grab survey

This section provides images related to the preliminary observations made during the processing of benthic grab samples acquired during the ground truthing survey. Information is given on each survey station, and images display the Particle Size Analysis (PSA) sample, 1mm and 5mm sieve samples. *Please Note: this table is not compliant with the WCAG 2.1 accessibility guidelines.*

Table 1. Preliminary observations made during the processing of benthic grab samples acquired during the ground truthing survey.

Station code	Image 1 (PSA)	Image2 (1 mm)	Image3 (5 mm)
WBRF_CEND0313_HP07_STN_06_A1			
WBRF_CEND0313_MP09_STN_11_A1			
WBRF_CEND0313_HP45_STN_33_A1			
WBRF_CEND0313_HP43_STN_40_A1		No image available	
WBRF_CEND0313_HP39_STN_43_A1			No image available
WBRF_CEND0313_HP37_STN_46_A1			
WBRF_CEND0313_HP22_STN_60_A1			
WBRF_CEND0313_MP03_STN_78_A1			

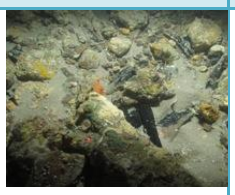
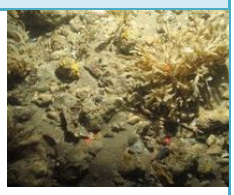
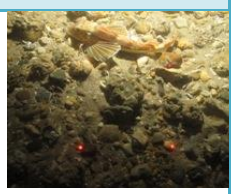
Station code	Image 1 (PSA)	Image2 (1 mm)	Image3 (5 mm)
WBRF_CEND0313_HP42_STN_98_A1			
WBRF_CEND0313_HP48_STN_101_A1			
WBRF_CEND0313_HP31a_STN_119_A3			
WBRF_CEND0313_MP17_STN_139_A1			
WBRF_CEND0313_LP06_STN_142_A1			
WBRF_CEND0313_MP19_STN_145_A2			
WBRF_CEND0313_AddGT15_STN_147_A1			
WBRF_CEND0313_MP22_STN_150_A1			No image available
WBRF_CEND0313_HP30_STN_164_A2			

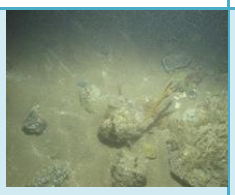
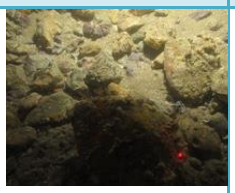
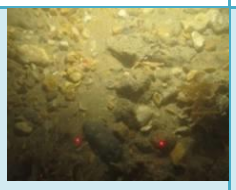
4.1.3 Drop Camera survey seabed Imagery

In total 122 camera deployments were carried out. Preliminary assessment of the video footage and still images identified a range of habitats which include bedrock, rock, stony reef, and sand. Key species observed include encrusting sponges, erect bryozoans, anemones, hydroids and brittle star beds (Table 2).

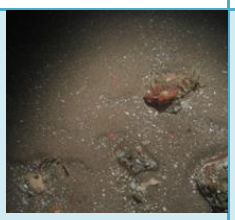
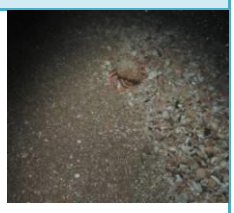
This section provides images representing the habitat types observed in still images during drop camera deployment. Information is given on each survey station, and the three associated images display the habitat types photographed. *Please Note: this table is not compliant with the WCAG 2.1 accessibility guidelines.*

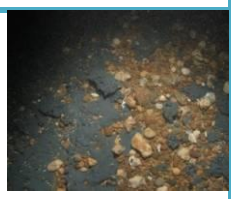
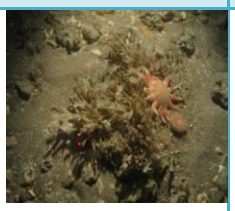
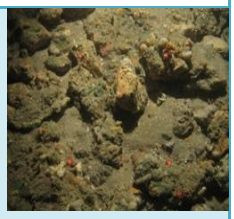
Table 2. A representation of habitat types observed in still images during drop camera deployment.

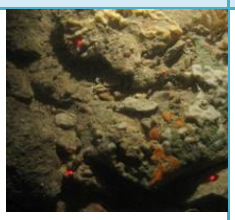
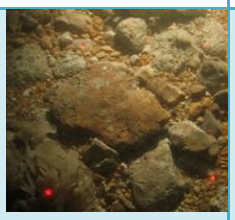
Station code	Image 1	Image 2	Image 3
WBRF_CEND0313_HP03_STN_03_A2			
WBRF_CEND0313_MP02_STN_07_A1			
WBRF_CEND0313_MP04_STN_08_A1			
WBRF_CEND0313_MP06_STN_09_A1			
WBRF_CEND0313_MP09_STN_10_A1			
WBRF_CEND0313_MP12_STN_12_A1			
WBRF_CEND0313_MP15_STN_13_A1			

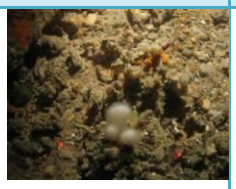
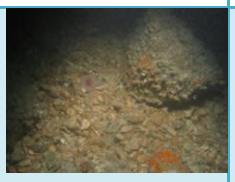
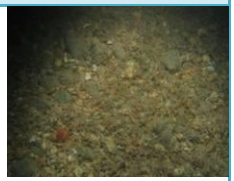
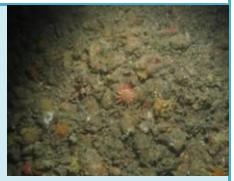
Station code	Image 1	Image 2	Image 3
WBRF_CEND0313_MP18_STN_14_A1			
WBRF_CEND0313_MP21_STN_15_A1			
WBRF_CEND0313_MP26_STN_16_A1			
WBRF_CEND0313_MP30_STN_17_A1			
WBRF_CEND0313_MP33_STN_18_A1			
WBRF_CEND0313_HP45_STN_20_A1			
WBRF_CEND0313_HP51_STN_35_A1			
WBRF_CEND0313_HP49_STN_37_A1			
WBRF_CEND0313_HP43_STN_39_A1			

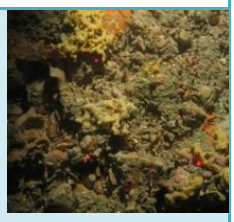
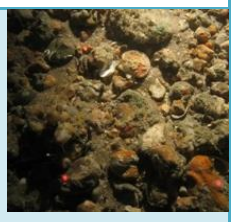
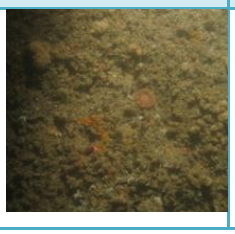
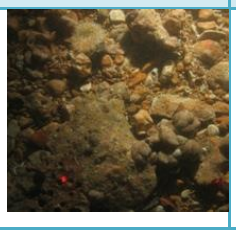
Station code	Image 1	Image 2	Image 3
WBRF_CEND0313_HP39_STN_42_A1			
WBRF_CEND0313_HP37_STN_45_A1			
WBRF_CEND0313_HP35_STN_48_A1			
WBRF_CEND0313_HP33_STN_50_A1			
WBRF_CEND0313_HP31_STN_53_A1			
WBRF_CEND0313_HP28_STN_55_A1			
WBRF_CEND0313_HP25_STN_57_A1			
WBRF_CEND0313_HP22_STN_59_A1			
WBRF_CEND0313_HP18_STN_62_A1			

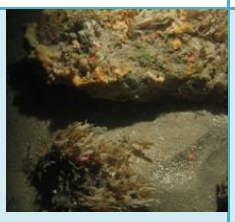
Station code	Image 1	Image 2	Image 3
WBRF_CEND0313_HP13_STN_64_A2			
WBRF_CEND0313_HP09_STN_66_A1			
WBRF_CEND0313_HP05_STN_68_A1			
WBRF_CEND0313_HP01_STN_70_A1			
WBRF_CEND0313_HP01_STN_70_A2			
WBRF_CEND0313_MP01_STN_74_A1			
WBRF_CEND0313_MP03_STN_77_A1			
WBRF_CEND0313_MP05_STN_80_A1			

Station code	Image 1	Image 2	Image 3
WBRF_CEND0313_MP07_STN_82_A1			
WBRF_CEND0313_MP10__STN_84_A1			
WBRF_CEND0313_MP13_STN_86_A2			
WBRF_CEND0313_MP16_STN_88_A1			
WBRF_CEND0313_MP23_STN_90_A1			
WBRF_CEND0313_MP28_STN_93_A1			
WBRF_CEND0313_MP31_STN_95_A1			
WBRF_CEND0313_HP42_STN_97_A1			

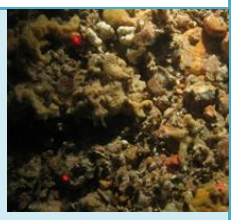
Station code	Image 1	Image 2	Image 3
WBRF_CEND0313_HP48_STN_100_A1			
WBRF_CEND0313_HP38_STN_106_A1			
WBRF_CEND0313_GT01_STN_109_A1			
WBRF_CEND0313_HP34_STN_111_A1			
WBRF_CEND0313_GT02_STN_113_A1			
WBRF_CEND0313_HP32_STN_116_A1			
WBRF_CEND0313_ADDGT3_STN_118_A1			
WBRF_CEND0313_HP29_STN_121_A1			

Station code	Image 1	Image 2	Image 3
WBRF_CEND0313_HP19_STN_130_A1			
WBRF_CEND0313_MP08_STN_132_A1			
WBRF_CEND0313_MP11_STN_134_A1			
WBRF_CEND0313_MP14_STN_136_A1			
WBRF_CEND0313_MP17_STN_138_A1			
WBRF_CEND0313_LP06_STN_141_A1			
WBRF_CEND0313_MP19_STN_144_A1			
WBRF_CEND0313_ADDGT15_STN_146_A1			
WBRF_CEND0313_MP22_STN_149_A1			

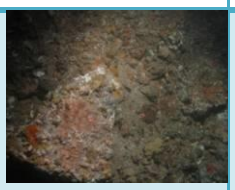
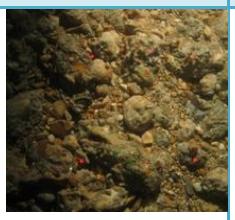
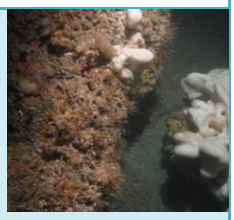
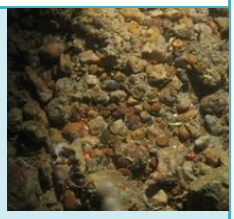
Station code	Image 1	Image 2	Image 3
WBRF_CEND0313_MP24_STN_152_A1			
WBRF_CEND0313_MP27_STN_154_A1			
WBRF_CEND0313_LP08_STN_155_A1			
WBRF_CEND0313_MP29_STN_157_A1			
WBRF_CEND0313_MP25_STN_159_A1			
WBRF_CEND0313_MP20_STN_161_A1			
WBRF_CEND0313_HP30_STN_163_A2			
WBRF_CEND0313_ADDGT16BOX3_STN_166_A1			

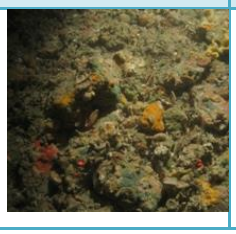
Station code	Image 1	Image 2	Image 3
WBRF_CEND0313_ADDGT17BOX3_STN_168_A1			
WBRF_CEND0313_ADDGT18BOX3_STN_171_A1			
WBRF_CEND0313_ADDGT20BOX3_STN_173_A1			
WBRF_CEND0313_ADDGT19BOX3_STN_175_A1			
WBRF_CEND0313_ADDGT21BOX3_STN_177_A1			
WBRF_CEND0313_ADDGT7_STN_179_A1			
WBRF_CEND0313_ADDGT6_STN_181_A1			
WBRF_CEND0313_ADDGT5_STN_184_A1			

Station code	Image 1	Image 2	Image 3
WBRF_CEND0313_ADDG4_STN_186_A1			
WBRF_CEND0313_ADDGT9_STN_188_A1			
WBRF_CEND0313_ADDGT10_STN_190_A1			
WBRF_CEND0313_ADDGT11_STN_192_A2			
WBRF_CEND0313_ADDGT12_STN_193_A1			
WBRF_CEND0313_HP02_STN_195_A1			
WBRF_CEND0313_HP06_STN_197_A1			
WBRF_CEND0313_HP08_STN_199_A1			

Station code	Image 1	Image 2	Image 3
WBRF_CEND0313_HP10_STN_201_A1			
WBRF_CEND0313_HP12_STN_203_A1			
WBRF_CEND0313_HP15_STN_206_A1			
WBRF_CEND0313_HP17_STN_208_A1			
WBRF_CEND0313_HP14_STN_210_A1			
WBRF_CEND0313_ADDGT24_STN_214_A1			
WBRF_CEND0313_ADDGT22_STN_216_A1			
WBRF_CEND0313_ADDGT23_STN_218_A1			

Station code	Image 1	Image 2	Image 3
WBRF_CEND0313_HP21_STN_220_A1			
WBRF_CEND0313_HP21_STN_221_A1			
WBRF_CEND0313_HP24_STN_223_A1			
WBRF_CEND0313_HP27_STN_225_A2			
WBRF_CEND0313_ADDGT27_STN_230_A1			
WBRF_CEND0313_ADDGT28_STN_232_A1			
WBRF_CEND0313_ADDGT26_STN_234_A1			
WBRF_CEND0313_BOX4ADDGT30_STN_236_A1			

Station code	Image 1	Image 2	Image 3
WBRF_CEND0313_BOX4ADDGT31_STN_238_A1			
WBRF_CEND0313_BOX5ADDGT42_STN_240_A1			
WBRF_CEND0313_BOX5ADDGT45_STN_242_A1			
WBRF_CEND0313_BOX5ADDGT47_STN_244_A1			
WBRF_CEND0313_BOX5ADDGT46_STN_246_A1			
WBRF_CEND0313_BOX5ADDGT43_STN_248_A1			
WBRF_CEND0313_ADDGT43_STN_250_A1			
WBRF_CEND0313_ADDGT39_STN_252_A2			

Station code	Image 1	Image 2	Image 3
WBRF_CEND0313_BOXADDGT38_STN_254_A1			
WBRF_CEND0313_BOX5ADDGT41_STN_256_A1			
WBRF_CEND0313_BOX5ADDGT40_STN_258_A1			
WBRF_CEND0313_BOX5ADDGT32_STN_260_A1			
WBRF_CEND0313_BOX5ADDGT29_STN_262_A1			
WBRF_CEND0313_ADDGT33A_STN_264_A1			
WBRF_CEND0313_MP32_266_A1			
WBRF_CEND0313_HP41_268_A1			

Station code	Image 1	Image 2	Image 3
WBRF_CEND0313_HP44_270_A1			
WBRF_CEND0313_BOX2ADDGT51_STN_272_A1			
WBRF_CEND0313_ADDGT49_STN_274_A1			
WBRF_CEND0313_ADDGT48_STN_276_A1			
WBRF_CEND0313_ADDGT48_STN_280_A2			
WBRF_CEND0313_ADDGT50_STN_282_A1			
WBRF_CEND0313_ADDGT37_STN_284_A1			
WBRF_CEND0313_ADDGT36_STN_286_A1			

4.1.4 Acoustic Survey

Multi-beam data were collected during transits between planned and adaptive ground truthing stations. Where transit lines duplicated existing acoustic data specific transit lines

were produced to ensure additional acoustic data coverage was achieved. One hundred percent SS and 50% MB data coverage of five planned survey boxes was also acquired. Acoustic data was used to plan adaptive ground truthing stations around features of interest. The acoustic survey data highlighted many interesting features throughout the site. These included flat plateaus, reef ridges, sediment bedforms and reef/sediment boundaries.

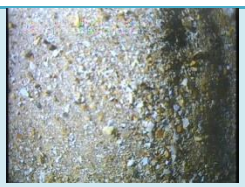
4.2 Bassurelle Sandbank

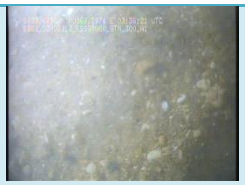
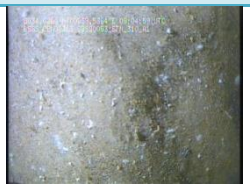
4.2.1 Benthic grab survey (HamCam)

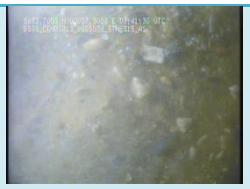
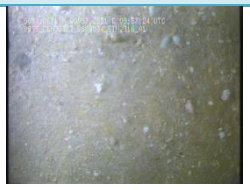
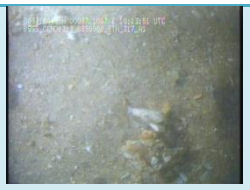
One hundred and four HamCam deployments were carried out at Bassurelle Sandbank cSAC (Table 3 and 4).

This section provides images representing screen grabs taken from the HamCam footage collected during the ground truthing survey carried out at Bassurelle Sandbank cSAC. Information is given on each survey station and an associated screen grab image. *Please Note: this table is not compliant with the WCAG 2.1 accessibility guidelines.*

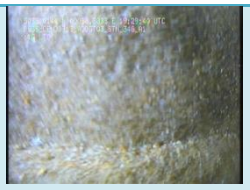
Table 3. Screen grabs taken from the HamCam footage collected during the ground truthing survey carried out at Bassurelle Sandbank cSAC.

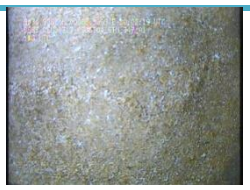
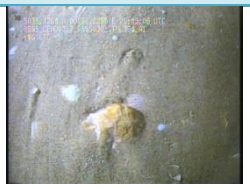
Station code	HamCam screen grab
BSSS_CEND0313_BSSS005_STN_292_A1	
BSSS_CEND0313_BSSS007_STN_293_A1	
BSSS_CEND0313_BSSS012_STN_294_A1	
BSSS_CEND0313_BSSS023_STN_296_A1	
BSSS_CEND0313_BSSS033_STN_297_A1	

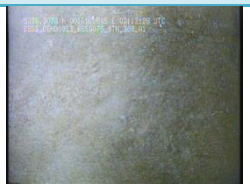
Station code	HamCam screen grab
BSSS_CEND0313_BSSS043_STN_299_A1	
BSSS_CEND0313_BSSS050_STN_300_A1	
BSSS_CEND0313_BSSS057_STN_302_A1	
BSSS_CEND0313_BSSS061_STN_303_A1	
BSSS_CEND0313_BSSS067_STN_304_A1	
BSSS_CEND0313_BSSS071_STN_305_A1	
BSSS_CEND0313_BSSS064_STN_307_A1	
BSSS_CEND0313_BSSS058_STN_308_A1	
BSSS_CEND0313_BSSS053_STN_310_A1	

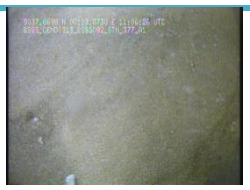
Station code	HamCam screen grab
BSSS_CEND0313_BSSS048_STN_312_A1	
BSSS_CEND0313_BSSS044_STN_314_A1	
BSSS_CEND0313_BSSS038_STN_315_A1	
BSSS_CEND0313_BSSS034_STN_316_A1	
BSSS_CEND0313_BSSS028_STN_317_A1	
BSSS_CEND0313_BSSS024_STN_319_A1	
BSSS_CEND0313_BSSS029_STN_320_A1	
BSSS_CEND0313_BSSS039_STN_322_A1	
BSSS_CEND0313_ADDGT02_STN_324_A1	

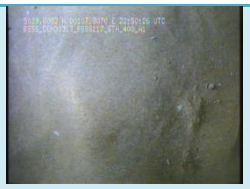
Station code	HamCam screen grab
BSSS_CEND0313_BSSS054_STN_325_A1	
BSSS_CEND0313_ADDGT07_STN_326_A1	
BSSS_CEND0313_ADDGT06_STN_327_A1	
BSSS_CEND0313_BSSS068_STN_328_A1	
BSSS_CEND0313_BSSS074_STN_329_A1	
BSSS_CEND0313_ADDGT13_STN_330_A1	
BSSS_CEND0313_BSSS072_STN_332_A1	
BSSS_CEND0313_ADDGT011_STN_333_A1	
BSSS_CEND0313_ADDGT012_STN_334_A1	

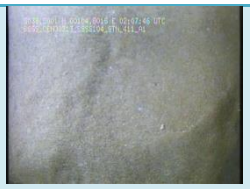
Station code	HamCam screen grab
BSSS_CEND0313_ADDGT010_STN_335_A1	
BSSS_CEND0313_BSSS065_STN_337_A1	
BSSS_CEND0313_ADDGT009_STN_338_A1	
BSSS_CEND0313_ADDGT008_STN_340_A1	
BSSS_CEND0313_BSSS059_STN_341_A1	
BSSS_CEND0313_ADDGT005_STN_342_A1	
BSSS_CEND0313_ADDGT001_STN_344_A1	
BSSS_CEND0313_BSSS052_STN_345_A1	
BSSS_CEND0313_ADDGT003_STN_346_A1	

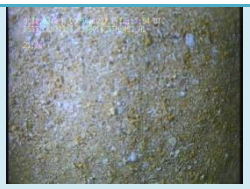
Station code	HamCam screen grab
BSSS_CEND0313_ADDGT004_STN_347_A1	
BSSS_CEND0313_BSSS045_STN_348_A1	
BSSS_CEND0313_BSSS035_STN_349_A1	
BSSS_CEND_0313_BSSS025_STN_351_A1	
BSSS_CEND_0313_BSSS016_STN_352_A1	
BSSS_CEND_0313_BSSS020_STN_353_A1	
BSSS_CEND_0313_BSSS030_STN_354_A1	
BSSS_CEND_0313_BSSS026_STN_355_A1	
BSSS_CEND_0313_BSSS036_STN_357_A1	

Station code	HamCam screen grab
BSSS_CEND_0313_BSSS 040_STN_359_A1	
BSSS_CEND_0313_BSSS 046_STN_360_A1	
BSSS_CEND_0313_BSSS 049_STN_361_A1	
BSSS_CEND_0313_BSSS 055_STN_363_A1	
BSSS_CEND_0313_BSSS 062_STN_364_A1	
BSSS_CEND_0313_BSSS 069_STN_366_A1	
BSSS_CEND_0313_ADD GT14_STN_367_A1	
BSSS_CEND_0313_BSSS 075_STN_368_A1	
BSSS_CEND_0313_BSSS 099_STN_375_A1	

Station code	HamCam screen grab
BSSS_CEND_0313_BSSS 092_STN_377_A1	
BSSS_CEND_0313_BSSS 084_STN_379_A1	
BSSS_CEND_0313_BSSS 081_STN_380_A1	
BSSS_CEND_0313_BSSS 078_STN_381_A1	
BSSS_CEND_0313_BSSS 080_STN_382_A1	
BSSS_CEND_0313_BSSS 077_STN_386_A1	
BSSS_CEND_0313_BSSS 085_STN_388_A1	
BSSS_CEND_0313_BSSS 088_STN_389_A1	
BSSS_CEND_0313_BSSS 093_STN_390_A1	

Station code	HamCam screen grab
BSSS_CEND_0313_BSSS 091_STN_392_A1	
BSSS_CEND_0313_BSSS 096_STN_393_A2	
BSSS_CEND_0313_BSSS 100_STN_394_A1	
BSSS_CEND_0313_BSSS 107_STN_395_A1	
BSSS_CEND_0313_BSSS 110_STN_397_A1	
BSSS_CEND_0313_BSSS 114_STN_398_A1	
BSSS_CEND_0313_BSSS 117_STN_400_A1	
BSSS_CEND_0313_BSSS 120_STN_402_A1	
BSSS_CEND_0313_BSSS 115_STN_403_A	

Station code	HamCam screen grab
BSSS_CEND_0313_BSSS 112_STN_404_A1	
BSSS_CEND_0313_BSSS 111_STN_406_A1	
BSSS_CEND_0313_BSSS 105_STN_407_A1	
BSSS_CEND_0313_BSSS 103_STN_408_A1	
BSSS_CEND_0313_BSSS 101_STN_409_A1	
BSSS_CEND0313_BSSS1 08_STN_410_A1	
BSSS_CEND_0313_BSSS 104_STN_411_A1	
BSSS_CEND_0313_BSSS 097_STN_412_A1	
BSSS_CEND_0313_BSSS 098_STN_414_A1	

Station code	HamCam screen grab
BSSS_CEND0313_BSSS094_STN_415_A1	
BSSS_CEND0313_BSSS089_STN_416_A1	
BSSS_CEND0313_BSSS086_STN_417_A1	
BSSS_CEND0313_BSSS083_STN_418_A1	
BSSS_CEND0313_BSSS015_STN_430_A1	
BSSS_CEND0313_BSSS019_STN_431_A1	
BSSS_CEND0313_BSSS014_STN_432_A1	
BSSS_CEND0313_BSSS009_STN_433_A1	

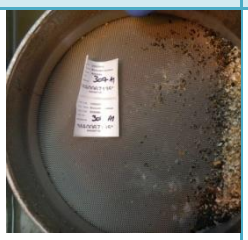
Station code	HamCam screen grab
BSSS_CEND0313_BSSS004_STN_434_A1	
BSSS_CEND0313_BSSS002_STN_436_A1	
BSSS_CEND0313_BSSS001_STN_437_A1	
BSSS_CEND0313_BSSS003_STN_438_A1	
BSSS_CEND0313_BSSS008_STN_439_A1	
BSSS_CEND0313_BSSS006_STN_440_A1	
BSSS_CEND0313_BSSS010_STN_441_A1	

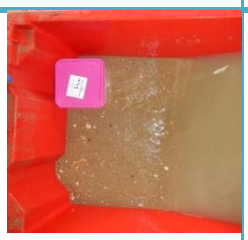
4.2.2 Benthic grab survey

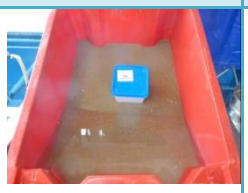
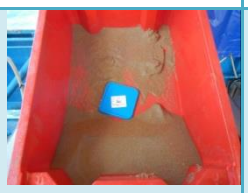
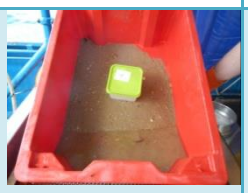
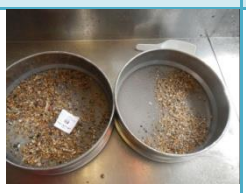
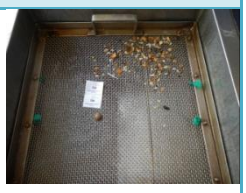
This section provides images related to the preliminary observations made during the processing of benthic grab samples acquired during the ground truthing survey. Information is given on each survey station, and images display the Particle Size Analysis (PSA) sample, 1mm and 5mm sieve samples. *Please Note: this table is not compliant with the WCAG 2.1 accessibility guidelines.*

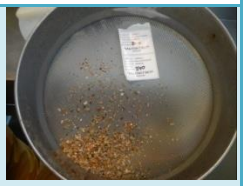
Table 4. Preliminary observations made during the processing of benthic grab samples acquired during the ground truthing survey.

Station code	Img1 (psa)	Img2 (1 mm)	Img3 (5 mm)
BSSS_CEND0313_BSSS005_STN_292_A1			No image available
BSSS_CEND0313_BSSS007_STN_293_A1			No image available
BSSS_CEND0313_BSSS012_STN_294_A1		No image available	
BSSS_CEND0313_BSSS023_STN_296_A1			
BSSS_CEND0313_BSSS033_STN_297_A1			
BSSS_CEND0313_BSSS043_STN_299_A1			
BSSS_CEND0313_BSSS050_STN_300_A1			
BSSS_CEND0313_BSSS057_STN_302_A1			

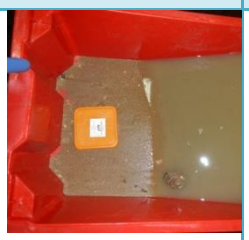
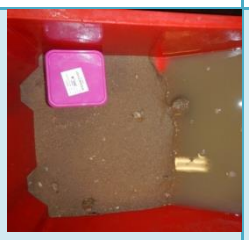
Station code	Img1 (psa)	Img2 (1 mm)	Img3 (5 mm)
BSSS_CEND0313_BSSS061_STN_303_A1			
BSSS_CEND0313_BSSS067_STN_304_A1			
BSSS_CEND0313_BSSS071_STN_305_A1		No image available	
BSSS_CEND0313_BSSS064_STN_307_A1			
BSSS_CEND0313_BSSS058_STN_308_A1	No image available	No image available	
BSSS_CEND0313_BSSS053_STN_310_A1			
BSSS_CEND0313_BSSS051_STN_311_A1			

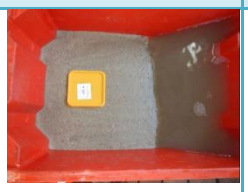
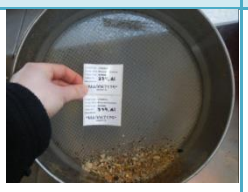
Station code	Img1 (psa)	Img2 (1 mm)	Img3 (5 mm)
BSSS_CEND0313_BSSS048_STN_312_A1			
BSSS_CEND0313_BSSS044_STN_314_A1			
BSSS_CEND0313_BSSS038_STN_315_A1			
BSSS_CEND0313_BSSS034_STN_316_A1			
BSSS_CEND0313_BSSS028_STN_317_A1			
BSSS_CEND0313_BSSS024_STN_319_A1			
BSSS_CEND0313_BSSS029_STN_320_A1			

Station code	Img1 (psa)	Img2 (1 mm)	Img3 (5 mm)
BSSS_CEND0313_BSSS039_STN_322_A1			
BSSS_CEND0313_ADDGT02_STN_324_A1			
BSSS_CEND0313_BSSS054_STN_325_A1			
BSSS_CEND0313_ADDGT07_STN_326_A1			
BSSS_CEND0313_ADDGT06_STN_327_A1			
BSSS_CEND0313_BSSS068_STN_328_A1			
BSSS_CEND0313_BSSS074_STN_329_A1			
BSSS_CEND0313_ADDGT13_STN_330_A1			
BSSS_CEND0313_BSSS072_STN_332_A1			

Station code	Img1 (psa)	Img2 (1 mm)	Img3 (5 mm)
BSSS_CEND0313_ADDGT011_STN_333_A1			
BSSS_CEND0313_ADDGT012_STN_334_A1			
BSSS_CEND0313_ADDGT010_STN_335_A1			
BSSS_CEND0313_BSSS065_STN_337_A1			
BSSS_CEND0313_ADDGT009_STN_338_A1			
BSSS_CEND0313_ADDGT008_STN_340_A1			
BSSS_CEND0313_BSSS059_STN_341_A1			
BSSS_CEND0313_ADDGT005_STN_342_A1			
BSSS_CEND0313_ADDGT001_STN_344_A1			

Station code	Img1 (psa)	Img2 (1 mm)	Img3 (5 mm)
BSSS_CEND0313_BSSS052_STN_345_A1			
BSSS_CEND0313_ADDGT003_STN_346_A1			
BSSS_CEND0313_ADDGT004_STN_347_A1			
BSSS_CEND0313_BSSS045_STN_348_A1			
BSSS_CEND0313_BSSS035_STN_349_A1			
BSSS_CEND_0313_BSSS025_STN_351_A1			
BSSS_CEND_0313_BSSS016_STN_352_A1			
BSSS_CEND_0313_BSSS020_STN_353_A1			
BSSS_CEND_0313_BSSS030_STN_354_A1			

Station code	Img1 (psa)	Img2 (1 mm)	Img3 (5 mm)
BSSS_CEND_0313_BSSS026_STN_355_A1			
BSSS_CEND_0313_BSSS036_STN_357_A1			
BSSS_CEND_0313_BSSS040_STN_359_A1			
BSSS_CEND_0313_BSSS046_STN_360_A1			
BSSS_CEND_0313_BSSS049_STN_361_A1			
BSSS_CEND_0313_BSSS055_STN_363_A1			
BSSS_CEND_0313_BSSS062_STN_364_A1			

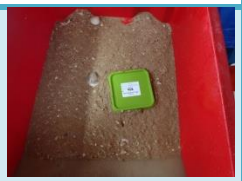
Station code	Img1 (psa)	Img2 (1 mm)	Img3 (5 mm)
BSSS_CEND_0313_BSSS069_STN_366_A1			
BSSS_CEND_0313_ADDGT14_STN_367_A1			
BSSS_CEND_0313_BSSS075_STN_368_A1			
BSSS_CEND_0313_BSSS099_STN_375_A1			
BSSS_CEND_0313_BSSS092_STN_377_A1			
BSSS_CEND_0313_BSSS084_STN_379_A1			
BSSS_CEND_0313_BSSS081_STN_380_A1			
BSSS_CEND_0313_BSSS078_STN_381_A1			

Station code	Img1 (psa)	Img2 (1 mm)	Img3 (5 mm)
BSSS_CEND_0313_BSSS080_STN_382_A1			
BSSS_CEND_0313_BSSS078_STN_381_A1			
BSSS_CEND_0313_BSSS080_STN_382_A1			
BSSS_CEND_0313_BSSS077_STN_386_A1			
BSSS_CEND_0313_BSSS085_STN_388_A1			
BSSS_CEND_0313_BSSS088_STN_389_A1			
BSSS_CEND_0313_BSSS093_STN_390_A1			
BSSS_CEND_0313_BSSS091_STN_392_A1			
BSSS_CEND_0313_BSSS096_STN_393_A1			

Station code	Img1 (psa)	Img2 (1 mm)	Img3 (5 mm)
BSSS_CEND_0313_BSSS100_STN_394_A1			
BSSS_CEND_0313_BSSS107_STN_395_A1			
BSSS_CEND_0313_BSSS110_STN_397_A1			
BSSS_CEND_0313_BSSS114_STN_398_A1			
BSSS_CEND_0313_BSSS117_STN_400_A1			
BSSS_CEND_0313_BSSS120_STN_402_A1			
BSSS_CEND_0313_BSSS115_STN_403_A			
BSSS_CEND_0313_BSSS112_STN_404_A1			
BSSS_CEND_0313_BSSS111_STN_406_A1			

Station code	Img1 (psa)	Img2 (1 mm)	Img3 (5 mm)
BSSS_CEND_0313_BSSS105_STN_407_A1			
BSSS_CEND_0313_BSSS103_STN_408_A1			
BSSS_CEND_0313_BSSS101_STN_409_A1			
BSSS_CEND0313_BSSS108_STN_410_A1			
BSSS_CEND_0313_BSSS104_STN_411_A1			
BSSS_CEND_0313_BSSS097_STN_412_A1			
BSSS_CEND_0313_BSSS098_STN_414_A1			
BSSS_CEND0313_BSSS094_STN_415_A1			
BSSS_CEND0313_BSSS089_STN_416_A1			

Station code	Img1 (psa)	Img2 (1 mm)	Img3 (5 mm)
BSSS_CEND0313_BSSS086_STN_417_A1			
BSSS_CEND0313_BSSS083_STN_418_A1			
BSSS_CEND0313_BSSS015_STN_430_A1			
BSSS_CEND0313_BSSS019_STN_431_A1			
BSSS_CEND0313_BSSS014_STN_432_A1			
BSSS_CEND0313_BSSS009_STN_433_A1			
BSSS_CEND0313_BSSS004_STN_434_A1			No Image available
BSSS_CEND0313_BSSS002_STN_436_A1			
BSSS_CEND0313_BSSS001_STN_437_A1			

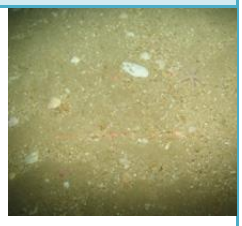
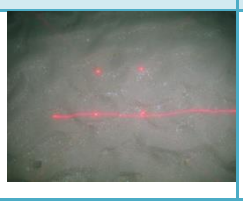
Station code	Img1 (psa)	Img2 (1 mm)	Img3 (5 mm)
BSSS_CEND0313_BSSS003_STN_438_A1			
BSSS_CEND0313_BSSS008_STN_439_A1			
BSSS_CEND0313_BSSS006_STN_440_A1			
BSSS_CEND0313_BSSS010_STN_441_A1			

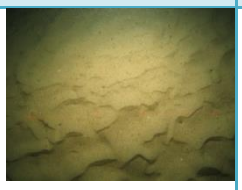
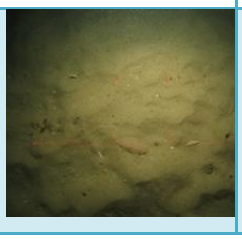
4.2.3 Camera sledge survey

Thirty-two camera sledge deployments were carried out at Bassurelle Sandbank cSAC. Preliminary observations show a fairly homogenous sandy bed at all camera stations.

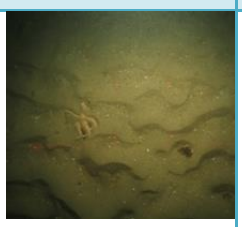
This section provides images representing the habitat types observed in still images during camera sledge deployment. Information is given on each survey station, and the three associated images display the habitat types photographed. *Please Note: this table is not compliant with the WCAG 2.1 accessibility guidelines.*

Table 5. A representation of habitat types observed in still images during camera sledge deployment.

Station code	Img1	Img2	Img3
BSSS_CEND_0313_BSSS023_STN_295_A1			
BSSS_CEND_0313_BSSS033_STN_298_A1			
BSSS_CEND_0313_BSSS050_STN_301_A1			
BSSS_CEND_0313_BSSS071_STN_306_A1			
BSSS_CEND_0313_BSSS058_STN_309_A1			
BSSS_CEND_0313_BSSS044_STN_313_A1			
BSSS_CEND_0313_BSSS024_STN_318_A1			
BSSS_CEND_0313_BSSS039_STN_321_A1			

Station code	Img1	Img2	Img3
BSSS_CEND_0313_ADDGT002_STN_323_A1			
BSSS_CEND_0313_BSSS072_STN_331_A1			
BSSS_CEND_0313_ADDGT010_STN_336_A1			
BSSS_CEND_0313_ADDGT008_STN_339_A1			
BSSS_CEND_0313_ADDGT001_STN_343_A1			
BSSS_CEND_0313_BSSS025_STN_350_A1			
BSSS_CEND_0313_BSSS036_STN_356_A1			
BSSS_CEND_0313_BSSS040_STN_358_A1			
BSSS_CEND_0313_BSSS055_STN_362_A1			

Station code	Img1	Img2	Img3
BSSS_CEND_0313_BSSS069_STN_365_A1			
BSSS_CEND_0313_BSSS039_STN_369_A1			
BSSS_CEND_0313_ADDGT02_STN_370_A1			
BSSS_CEND_0313_BSSS099_STN_374_A1			
BSSS_CEND_0313_BSSS092_STN_376_A1			
BSSS_CEND_0313_BSSS084_STN_378_A1			
BSSS_CEND_0313_BSSS080_STN_385_A1			
BSSS_CEND_0313_BSSS085_STN_387_A1			

Station code	Img1	Img2	Img3
BSSS_CEND_0313_BSSS091_STN_391_A1			
BSSS_CEND_0313_BSSS110_STN_396_A1			
BSSS_CEND_0313_BSSS117_STN_399_A1			
BSSS_CEND_0313_BSSS120_STN_401_A1			
BSSS_CEND0313_BSSS111_STN_405_A1			
BSSS_CEND0313_BSSS098_STN_413_A1			
BSSS_CEND0313_BSSS002_STN_435_A1			

5 Anthropogenic Impacts

5.1 Fishing activity

Fishing activity was observed while surveying at both the Wight Barfleur Reef and Bassurelle Sandbank cSACs.

Pair trawling (Figure 11) was the primary type of fishing observed at the Wight Barfleur Reef site. Fishing activity was primarily observed on the southern boundary of the site. Fishing activity was also observed at Bassurelle Sandbank. The primary type of fishing observed was also beam trawling. Evidence of fishing activity was also observed on the SS acoustic record (Figure 12).

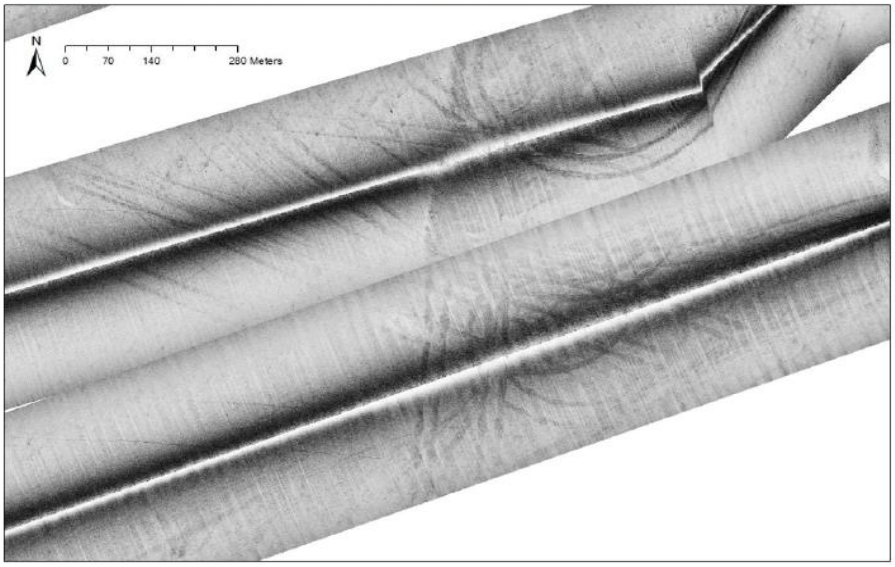


Figure 9. An example of trawl marks observed on the side scan record at Bassurelle Sandbank.

6 Annex one habitat

6.1 Wight Barfleur Reef

Large areas of bedrock and stony reef were preliminarily identified at this site. These habitats exhibited a diverse range of encrusting/reef organisms which included sponges (encrusting and branching), hydroids, ascidians, anemones and tube worms. Large boulder fields were also observed near the southern boundary of the site.

6.2 Bassurelle Sandbank

Preliminary observations from data collected at this site indicate a homogenous sandy habitat. As the site is designated as a sandbank further analysis of the bathymetric data will be needed to confirm the boundary of the Annex 1 feature.

7 Annexes

7.1 RV Cefas Endeavour

Port of registry	Lowestoft
Length OA	73.00m (excluding stern roller)
Length extreme	73.916m
Breadth (MLD)	15.80m
Depth (MLD)	8.20m
Design draft	5.00m
Deep draught	5.50m
LBP	66.50m
Gross tonnage	2983 tonnes
Net register tonnage	894 tonnes
Net lightship	2436 tonnes
Deadweight @ 5.00m	784 tonnes
Deadweight @ 5.50m	1244 tonnes
Displacement @ 5.00m	3210 tonnes
Displacement @ 5.50m	3680 tonnes
Builder	Ferguson Shipbuilders Limited, Port Glasgow
Commissioned	2003
Communications	In port BT Tel. Cellphone Voice/Fax/Data Radio TELEX Inmarsat C Fleet 77 (Inmarsat F) and VSAT (eutelsat) internet access
Endurance	42 days
Complement	En-suite accommodation for 16 crew and 19 scientists with dedicated hospital facility
Propulsion System	AC/DC Diesel Electric 3 x diesel electric AC generators, individually raft mounted 2 x tandem electric DC motors Single screw
Power generation	3240Kw
Power propulsion	2230Kw
Thrusters	Bow thruster (flush mounted azimuthing) Stern thruster (tunnel)
Trial speed	14.4 knots
Bollard pull	29 tonnes
Call sign	VQHF3
Official number	906938
MMSI	235005270

Lloyds/IMO number	9251107
Side Gantry	7.5 tonne articulated side A-frame
Stern Gantry	25 tonne stern A-frame
Winches	3 x cranes 35tM, heave compensated 2 x trawl winches 2 x drum winches, (1 double) Double barrel survey winch with motion compensation and slip rings Double barrel survey winch with slip rings Double barrel towing winch with slip rings Side-scan sonar winch with slip rings 3 x Gilson winches (one fitted to stern A-frame)
Transducers/Sea tube	Drop keel to deploy transducers outside the hull boundary layer in addition to hull mounted transducers 1.2m diameter sea tube/moon-pool
Acoustic equipment	Kongsberg Simrad: HiPAP 500 positioning sonar EK60, 38/120 kHz scientific sounder EA 600, 50/200 kHz scientific sounder Scanmar net mensuration system SH80 high frequency omni-directional sonar EM3002 swathe bathymetry sounder Hull mounted Scanmar fishing computer transducers
Boats	2 x 8m rigid work and rescue boats with suite of navigational equipment deployed on heave-compensated davits
Laboratories	8 networked laboratories designed for optimum flexibility of purpose 4 serviced deck locations for containerised laboratories
Special features	Dynamic positioning system Intering anti-roll system Local Area Network with scientific data management system Ship-wide general information system CCTV
Class	LRS 100A1+LMC UMS SCM CCS ICC IP ES(2) DP(CM) ICE class 2

7.2 Camera Sledge

Flash model: Kongsberg 11-242
Underwater lights – Cefas high power LED strip lights.
Video and stills camera settings variable depending on underwater visibility and ambient light levels.

7.3 Positioning Software-Tower

Vessel offsets are defined from the pitch roll centre of the vessel – the Common Reference Point (CRP) used by the Tower CEMAP software to calculate offsets.

7.4 Multi-beam Bathymetry

Model: Kongsberg EM3002D
Frequency: 300kHz; swathe width variable running in hi res equidistant mode
Latency correction not determined – 1pps synchronised time system utilised on vessel.
Model: Simrad EM2040
Frequency: 200/300/400kHz, swathe width variable dependant on water depth.

7.5 Metadata

Station metadata for the Wight Barfleur Reef cSAC and Bassurelle Sandbank cSAC surveys on cruise CEND 03/13 is provided below. Station Num is a sequential event number for the cruise, so changes each time a new gear is used or a new location is sampled. Station Code is used to identify the location of the sampling station. SS = Side-scan Sonar, MB = Multi-beam, HC = HamCam, HG = Hamon grab, CS = Camera Sledge, DC = Drop Camera.

7.5.1 Benthic grab metadata

Table 6. Benthic grab metadata.

Survey	Stn Code	Stn Num	Rep	Gear	Date	Lat	Long	Water depth	Sediment description
WBRF 2013	HP07	6	A1	HG	19/03/2013	50.3246	-1.8915	62	Very coarse clean shelly sand
WBRF 2013	HP09	11	A1	HG	19/03/2013	50.3254	-1.6105	59	Course sand and gravel with cobbles.
WBRF 2013	HP45	33	A1	HG	20/03/2013	50.3252	-1.0468	66	Slightly muddy course gravel.
WBRF 2013	HP43	40	A1	HG	20/03/2013	50.3641	-1.0818	58	Course gravel
WBRF 2013	HP39	43	A2	HG	20/03/2013	50.3635	-1.1537	51	Course gravel.
WBRF 2013	HP37	46	A2	HG	20/03/2013	50.3643	-1.2237	48	Course gravel.
WBRF 2013	HP22	60	A1	HG	20/03/2013	50.3644	-1.6447	57	Slightly muddy gravel with clasts.
WBRF 2013	MP03	78	A1	HG	21/03/2013	50.2860	-1.7855	65	Shelly gravel
WBRF 2013	HP42	98	A1	HG	20/03/2013	50.2863	-1.0830	59	Mixed-muddy sandy gravel with pebbles and shells
WBRF 2013	HP48	101	A1	HG	21/03/2013	50.2860	-1.0129	71	Muddy sand & gravel
WBRF 2013	HP31A	119	A3	HG	22/03/2013	50.3648	-1.4331	50	Coarse sand and gravels with pebbles
WBRF 2013	MP17	139	A1	HG	23/03/2013	50.1702	-1.3995	77	Sand with pebbles and cobbles
WBRF 2013	MP19	145	A2	HG	23/03/2013	50.1701	-1.3292	80	Coarse sand and gravels with pebbles
WBRF 2013	HP30	164	A2	HG	24/03/2013	50.2087	-1.4350	60	Conglomerate
BSSS 2013	BSSS005	292	A1	HC	29/03/2013	50.5567	0.9013	42	Coarse sand and shell
BSSS 2013	BSSS007	293	A1	HC	29/03/2013	50.5505	0.9121	42	Coarse sand and shell
BSSS 2013	BSSS012	294	A1	HC	29/03/2013	50.5533	0.9245	40	Coarse sand and shell
BSSS 2013	BSSS023	296	A1	HC	29/03/2013	50.5504	0.9477	39	Coarse sand and shell
BSSS 2013	BSSS033	297	A1	HC	29/03/2013	50.5526	0.9620	40	Coarse slightly gravelly and shell
BSSS 2013	BSSS043	299	A1	HC	29/03/2013	50.5557	0.9751	37	Coarse sand with shells
BSSS 2013	BSSS050	300	A1	HC	29/03/2013	50.5581	0.9883	39	Coarse sand with gravel
BSSS 2013	BSSS057	302	A1	HC	29/03/2013	50.5608	1.0014	37	Coarse sand and shell
BSSS 2013	BSSS061	303	A1	HC	29/03/2013	50.5700	1.0053	37	Muddy sand with shell
BSSS 2013	BSSS067	304	A1	HC	29/03/2013	50.5723	1.0186	34	Sand with shelly gravel
BSSS 2013	BSSS071	305	A1	HC	29/03/2013	50.5815	1.0211	30	Muddy sand
BSSS 2013	BSSS064	307	A1	HC	29/03/2013	50.5778	1.0081	30	Slightly muddy sand with shells
BSSS 2013	BSSS058	308	A1	HC	29/03/2013	50.5760	0.9942	38	Slightly muddy sand
BSSS 2013	BSSS053	310	A1	HC	29/03/2013	50.5672	0.9922	37	Slightly muddy sand with shell.
BSSS 2013	BSSS051	311	A1	HC	29/03/2013	50.5732	0.9818	28	Slightly muddy, shelly sand
BSSS 2013	BSSS048	312	A1	HC	29/03/2013	50.5644	0.9792	35	Coarse sand with shell
BSSS 2013	BSSS044	314	A1	HC	29/03/2013	50.5706	0.9677	30	Coarse sand with shell
BSSS 2013	BSSS038	315	A1	HC	29/03/2013	50.5619	0.9652	41	Slightly muddy sand with shell
BSSS 2013	BSSS034	316	A1	HC	29/03/2013	50.5679	0.9548	44	Coarse sand
BSSS 2013	BSSS028	317	A1	HC	29/03/2013	50.5592	0.9518	42	Coarse shelly sand
BSSS 2013	BSSS024	319	A1	HC	29/03/2013	50.5652	0.9408	36	Coarse shelly sand
BSSS 2013	BSSS029	320	A1	HC	29/03/2013	50.5741	0.9441	31	Clean shelly sand
BSSS 2013	BSSS039	322	A1	HC	29/03/2013	50.5766	0.9574	28	Coarse sand
BSSS 2013	ADDGT02	324	A1	HC	29/03/2013	50.5796	0.9716	27	Coarse sand

Survey	Stn Code	Stn Num	Rep	Gear	Date	Lat	Long	Water depth	Sediment description
BSSS 2013	BSSS054	325	A1	HC	29/03/2013	50.5822	0.9837	26	Fine clean sand
BSSS 2013	ADDGT07	326	A1	HC	29/03/2013	50.5838	0.9913	25	Clean sand
BSSS 2013	ADDGT06	327	A1	HC	29/03/2013	50.5850	0.9984	27	Clean sand
BSSS 2013	BSSS068	328	A1	HC	29/03/2013	50.5874	1.0108	31	Clean sand
BSSS 2013	BSSS074	329	A1	HC	29/03/2013	50.5901	1.0243	35	Clean sand
BSSS 2013	ADDGT13	330	A1	HC	29/03/2013	50.5935	1.0213	28	Clean sand
BSSS 2013	BSSS072	332	A1	HC	29/03/2013	50.5962	1.0148	26	Clean fine sand
BSSS 2013	ADDGT11	333	A1	HC	29/03/2013	50.5924	1.0126	23	Clean fine sand
BSSS 2013	ADDGT12	334	A1	HC	29/03/2013	50.5943	1.0084	25	Clean fine sand
BSSS 2013	ADDGT10	335	A1	HC	29/03/2013	50.5908	1.0064	23	Clean sand
BSSS 2013	BSSS065	337	A1	HC	29/03/2013	50.5931	1.0016	25	Clean sand
BSSS 2013	ADDGT09	338	A1	HC	29/03/2013	50.5888	0.9995	24	Clean sand
BSSS 2013	ADDGT08	340	A1	HC	29/03/2013	50.5882	0.9936	26	Clean sand
BSSS 2013	BSSS059	341	A1	HC	29/03/2013	50.5908	0.9878	28	Clean sand
BSSS 2013	ADDGT05	342	A1	HC	29/03/2013	50.5866	0.9864	22	Clean sand
BSSS 2013	ADDGT01	344	A1	HC	29/03/2013	50.5850	0.9798	22	Clean sand
BSSS 2013	BSSS052	345	A1	HC	29/03/2013	50.5880	0.9743	26	Clean sand
BSSS 2013	ADDGT03	346	A1	HC	29/03/2013	50.5835	0.9730	22	Clean sand
BSSS 2013	ADDGT04	347	A1	HC	29/03/2013	50.5820	0.9662	26	Clean sand
BSSS 2013	BSSS045	348	A1	HC	29/03/2013	50.5853	0.9610	32	Clean shelly sand
BSSS 2013	BSSS035	349	A1	HC	29/03/2013	50.5826	0.9473	31	Clean sand
BSSS 2013	BSSS025	351	A1	HC	29/03/2013	50.5799	0.9339	38	Shelly sand
BSSS 2013	BSSS016	352	A1	HC	29/03/2013	50.5771	0.9204	38	Clean shelly sand
BSSS 2013	BSSS020	353	A1	HC	29/03/2013	50.5860	0.9235	40	Clean shelly sand
BSSS 2013	BSSS030	354	A1	HC	29/03/2013	50.5887	0.9370	40	Clean shelly sand
BSSS 2013	BSSS026	355	A1	HC	29/03/2013	50.5946	0.9266	41	Clean shelly sand
BSSS 2013	BSSS036	357	A1	HC	29/03/2013	50.5975	0.9400	48	clean sand
BSSS 2013	BSSS040	359	A1	HC	29/03/2013	50.5915	0.9503	51	Slightly muddy shelly sand
BSSS 2013	BSSS046	360	A1	HC	30/03/2013	50.5999	0.9536	48	Slightly muddy sand with shells
BSSS 2013	BSSS049	361	A1	HC	30/03/2013	50.5944	0.9636	42	Fine muddy sand with shells.
BSSS 2013	BSSS055	363	A1	HC	30/03/2013	50.5965	0.9766	47	Slightly muddy sand with shell
BSSS 2013	BSSS062	364	A1	HC	30/03/2013	50.5997	0.9900	47	Slightly muddy sand with shell
BSSS 2013	BSSS069	366	A1	HC	30/03/2013	50.6022	1.0034	43	Clean sand with shell
BSSS 2013	ADDGT14	367	A1	HC	30/03/2013	50.6009	1.0164	28	Muddy sand with shell
BSSS 2013	BSSS075	368	A1	HC	30/03/2013	50.6050	1.0176	36	Clean sand
BSSS 2013	BSSS099	375	A1	HC	30/03/2013	50.6393	1.0678	51	Fine sediment, shells.
BSSS 2013	BSSS092	377	A1	HC	30/03/2013	50.6279	1.0512	44	Slightly muddy sand
BSSS 2013	BSSS084	379	A1	HC	30/03/2013	50.6165	1.0344	37	Clean sand
BSSS 2013	BSSS081	380	A1	HC	30/03/2013	50.6080	1.0320	24	Clean sand
BSSS 2013	BSSS078	381	A1	HC	30/03/2013	50.5991	1.0285	29	Clean sand
BSSS 2013	BSSS080	382	A1	HC	30/03/2013	50.5935	1.0382	29	Fine sand

Survey	Stn Code	Stn Num	Rep	Gear	Date	Lat	Long	Water depth	Sediment description
BSSS 2013	BSSS077	386	A1	HC	30/03/2013	50.5841	1.0350	29	Silty sand
BSSS 2013	BSSS085	388	A1	HC	30/03/2013	50.5959	1.0528	26	Silty sand
BSSS 2013	BSSS088	389	A1	HC	30/03/2013	50.6040	1.0556	20	Silty sand
BSSS 2013	BSSS093	390	A1	HC	30/03/2013	50.6071	1.0687	19	Fine sand
BSSS 2013	BSSS091	392	A1	HC	30/03/2013	50.6131	1.0586	21	Fine silty sand
BSSS 2013	BSSS096	393	A2	HC	30/03/2013	50.6159	1.0718	20	Fine sand
BSSS 2013	BSSS100	394	A1	HC	30/03/2013	50.6185	1.0859	18	Fine silty sand
BSSS 2013	BSSS107	395	A1	HC	30/03/2013	50.6299	1.1021	16	Clean sand
BSSS 2013	BSSS110	397	A1	HC	30/03/2013	50.6386	1.1052	17	Clean sand
BSSS 2013	BSSS114	398	A1	HC	30/03/2013	50.6414	1.1187	17	Clean sand
BSSS 2013	BSSS117	400	A1	HC	30/03/2013	50.6501	1.1219	30	Clean sand
BSSS 2013	BSSS120	402	A1	HC	30/03/2013	50.6619	1.1383	40	Shelly sand
BSSS 2013	BSSS115	403	A3	HC	30/03/2013	50.6564	1.1112	45	Sand
BSSS 2013	BSSS112	404	A1	HC	31/03/2013	50.6482	1.1086	36	Slightly muddy sand
BSSS 2013	BSSS111	406	A1	HC	31/03/2013	50.6530	1.0968	49	Muddy shelly sand
BSSS 2013	BSSS105	407	A1	HC	31/03/2013	50.6367	1.0916	20	Fine sand
BSSS 2013	BSSS103	408	A1	HC	31/03/2013	50.6279	1.0886	23	Fine clean sand
BSSS 2013	BSSS101	409	A1	HC	31/03/2013	50.6337	1.0781	22	Clean sand
BSSS 2013	BSSS108	410	A1	HC	31/03/2013	50.6447	1.0944	42	Fine muddy sand
BSSS 2013	BSSS104	411	A1	HC	31/03/2013	50.6418	1.0800	47	Slightly muddy sand
BSSS 2013	BSSS097	412	A1	HC	31/03/2013	50.6309	1.0641	23	Fine sand
BSSS 2013	BSSS098	414	A1	HC	31/03/2013	50.6244	1.0749	23	Coarse sand with shell
BSSS 2013	BSSS094	415	A1	HC	31/03/2013	50.6219	1.0615	23	Fine sand.
BSSS 2013	BSSS089	416	A1	HC	31/03/2013	50.6193	1.0480	25	Fine clean sand with shells
BSSS 2013	BSSS086	417	A1	HC	31/03/2013	50.6109	1.0452	23	Slighty muddy sand.
BSSS 2013	BSSS083	418	A1	HC	31/03/2013	50.6015	1.0415	28	Slightly muddy sand.
BSSS 2013	BSSS015	430	A1	HC	31/03/2013	50.5626	0.9279	35	Coarse clean shelly sand
BSSS 2013	BSSS019	431	A1	HC	31/03/2013	50.5566	0.9387	38	Coarse sand
BSSS 2013	BSSS014	432	A1	HC	31/03/2013	50.5473	0.9354	42	Coarse sand with shell
BSSS 2013	BSSS009	433	A1	HC	31/03/2013	50.5448	0.9221	41	Coarse sand with shell
BSSS 2013	BSSS004	434	A1	HC	31/03/2013	50.5422	0.9083	42	Coarse sand
BSSS 2013	BSSS002	436	A1	HC	31/03/2013	50.5478	0.8969	42	Coarse sand
BSSS 2013	BSSS001	437	A1	HC	31/03/2013	50.5541	0.8877	45	Shelly coarse sand
BSSS 2013	BSSS003	438	A1	HC	31/03/2013	50.5630	0.8906	47	Sand with shells
BSSS 2013	BSSS008	439	A1	HC	31/03/2013	50.5657	0.9042	44	Coarse sand with shells
BSSS 2013	BSSS006	440	A1	HC	31/03/2013	50.5718	0.8932	48	Fine sand and shell
BSSS 2013	BSSS010	441	A1	HC	31/03/2013	50.5746	0.9067	41	Fine sand and shell

7.5.2 Underwater video metadata

Table 7. Underwater video metadata.

Survey	Stn Code	Stn Num	Gear	Date	SOL Lat	SOL Long	EOL Lat	EOL Long	Water depth	Duration
WBRF 2013	WBRFHP03	3	DC	18/03/2013	50.3248245	-1.962776	50.3230475	-1.960015	56	0:10
WBRF 2013	WBRFMP02	7	DC	19/03/2013	50.3248224	-1.822599	50.324833	-1.82022	68	0:11
WBRF 2013	WBRFMP04	8	DC	19/03/2013	50.3248633	-1.752317	50.3250826	-1.750122	65	0:13
WBRF 2013	WBRFMP06	9	DC	19/03/2013	50.3251123	-1.679045	50.3252098	-1.681273	57	0:10
WBRF 2013	WBRFMP09	10	DC	19/03/2013	50.3244847	-1.610772	50.3252858	-1.610489	58	0:10
WBRF 2013	WBRFMP12	12	DC	19/03/2013	50.3254092	-1.540986	50.3254267	-1.539665	54	0:10
WBRF 2013	WBRFMP15	13	DC	19/03/2013	50.3247929	-1.470228	50.3259416	-1.468857	56	0:11
WBRF 2013	WBRFMP18	14	DC	19/03/2013	50.3257553	-1.400476	50.3256464	-1.398258	54	0:10
WBRF 2013	WBRFMP21	15	DC	19/03/2013	50.3252841	-1.330135	50.3256876	-1.327003	62	0:14
WBRF 2013	WBRFMP26	16	DC	19/03/2013	50.3255507	-1.259589	50.3261737	-1.257711	61	0:10
WBRF 2013	WBRFMP30	17	DC	19/03/2013	50.3256821	-1.18893	50.3249906	-1.187145	62	0:09
WBRF 2013	WBRFMP33	18	DC	19/03/2013	50.3260414	-1.118151	50.3247164	-1.117365	69	0:10
WBRF 2013	WBRFHP45	20	DC	20/03/2013	50.3244956	-1.04843	50.3250239	-1.047246	65	0:11
WBRF 2013	WBRFHP51	35	DC	20/03/2013	50.3244404	-0.97815	50.3248734	-0.976904	65	0:10
WBRF 2013	WBRFHP49	37	DC	20/03/2013	50.3634235	-1.013334	50.3637255	-1.011952	55	0:11
WBRF 2013	WBRFHP43	39	DC	20/03/2013	50.3637158	-1.083318	50.3640135	-1.082121	58	0:10
WBRF 2013	WBRFHP39	42	DC	20/03/2013	50.3633952	-1.153839	50.3640145	-1.153216	50	0:09
WBRF 2013	WBRFHP37	45	DC	20/03/2013	50.364064	-1.224557	50.3643559	-1.223348	49	0:10
WBRF 2013	WBRFHP35	48	DC	20/03/2013	50.3640982	-1.292269	50.3645496	-1.293699	49	0:10
WBRF 2013	WBRFHP33	50	DC	20/03/2013	50.364669	-1.362754	50.3642495	-1.364024	49	0:10
WBRF 2013	WBRFHP31	53	DC	20/03/2013	50.3648115	-1.433033	50.3642933	-1.434232	49	0:11
WBRF 2013	WBRFHP28	55	DC	20/03/2013	50.3647813	-1.505998	50.3644266	-1.504882	48	0:09
WBRF 2013	WBRFHP25	57	DC	20/03/2013	50.3650751	-1.575657	50.3641741	-1.57484	61	0:12
WBRF 2013	WBRFHP22	59	DC	20/03/2013	50.363628	-1.646408	50.3642291	-1.64531	56	0:11
WBRF 2013	WBRFHP18	62	DC	20/03/2013	50.3640188	-1.717074	50.3640989	-1.715697	52	0:10
WBRF 2013	WBRFHP13	64	DC	20/03/2013	50.3635161	-1.787332	50.3636962	-1.785838	53	0:18
WBRF 2013	WBRFHP09	66	DC	20/03/2013	50.3633072	-1.858047	50.3632971	-1.856713	49	0:10
WBRF 2013	WBRFHP05	68	DC	20/03/2013	50.3625217	-1.928315	50.3629402	-1.92713	52	0:10
WBRF 2013	WBRFHP01	70	DC	20/03/2013	50.2856752	-1.995719	50.2845898	-1.997687	58	0:20
WBRF 2013	WBRFHP04	72	DC	20/03/2013	50.2844561	-1.927962	50.284456	-1.930556	58	0:20
WBRF 2013	WBRFMP01	74	DC	20/03/2013	50.2850375	-1.855339	50.2857758	-1.855967	59	0:10
WBRF 2013	WBRFMP03	77	DC	21/03/2013	50.2857385	-1.786931	50.2860191	-1.785527	65	0:11
WBRF 2013	WBRFMP05	80	DC	21/03/2013	50.2862482	-1.714266	50.286358	-1.715666	59	0:10
WBRF 2013	WBRFMP07	82	DC	21/03/2013	50.2862754	-1.64386	50.2864924	-1.645268	64	0:11
WBRF 2013	WBRFMP10	84	DC	21/03/2013	50.286342	-1.573266	50.28679	-1.575253	58	0:15
WBRF 2013	WBRFMP13	86	DC	21/03/2013	50.2865679	-1.505842	50.2866333	-1.504391	58	0:11
WBRF 2013	WBRFMP16	88	DC	21/03/2013	50.2864419	-1.435303	50.2865365	-1.434064	64	0:10
WBRF 2013	WBRFMP23	90	DC	21/03/2013	50.2863444	-1.294879	50.2867992	-1.293241	67	0:15

Survey	Stn Code	Stn Num	Gear	Date	SOL Lat	SOL Long	EOL Lat	EOL Long	Water depth	Duration
WBRF 2013	WBRFMP28	93	DC	21/03/2013	50.2865034	-1.224587	50.286504	-1.223266	64	0:10
WBRF 2013	WBRFMP31	95	DC	21/03/2013	50.2868777	-1.154215	50.2864587	-1.152942	63	0:10
WBRF 2013	WBRFHP42	97	DC	21/03/2013	50.2860425	-1.081671	50.2862544	-1.082894	60	0:10
WBRF 2013	WBRFHP48	100	DC	21/03/2013	50.2858387	-1.01129	50.2859974	-1.01269	70	0:10
WBRF 2013	WBRFHP38	106	DC	21/03/2013	50.4031858	-1.18901	50.4030465	-1.187719	41	0:10
WBRF 2013	ADDGT01	109	DC	22/03/2013	50.3633375	-1.260238	50.3644895	-1.259167	51	0:17
WBRF 2013	WBRFHP34	111	DC	22/03/2013	50.4036508	-1.329777	50.4031697	-1.328499	43	0:10
WBRF 2013	ADDGT02	113	DC	22/03/2013	50.3670948	-1.351912	50.370166	-1.35087	51	0:38
WBRF 2013	WBRFHP32	116	DC	22/03/2013	50.4023075	-1.398214	50.4030823	-1.398932	44	0:10
WBRF 2013	ADDGT03	118	DC	22/03/2013	50.3641058	-1.397258	50.3650705	-1.394047	52	0:27
WBRF 2013	WBRFHP29	121	DC	22/03/2013	50.4033225	-1.470587	50.4031418	-1.469167	44	0:11
WBRF 2013	WBRFHP19	130	DC	23/03/2013	50.1700138	-1.681156	50.1698235	-1.679885	65	0:11
WBRF 2013	WBRFMP08	132	DC	23/03/2013	50.1696716	-1.610965	50.1700251	-1.609611	68	0:11
WBRF 2013	WBRFMP11	134	DC	23/03/2013	50.1695813	-1.540825	50.1699217	-1.539747	74	0:10
WBRF 2013	WBRFMP14	136	DC	23/03/2013	50.169539	-1.470363	50.17019	-1.469291	83	0:11
WBRF 2013	WBRFMP17	138	DC	23/03/2013	50.1699957	-1.398087	50.1702366	-1.399413	79	0:10
WBRF 2013	WBRFLP06	141	DC	23/03/2013	50.2089289	-1.362852	50.2089908	-1.364246	61	0:11
WBRF 2013	WBRFMP19	144	DC	23/03/2013	50.1702334	-1.327864	50.1701429	-1.329287	80	0:10
WBRF 2013	ADDGT15	146	DC	23/03/2013	50.167896	-1.329142	50.1681434	-1.327764	77	0:11
WBRF 2013	WBRFMP22	149	DC	23/03/2013	50.2096818	-1.293089	50.2090283	-1.293955	82	0:12
WBRF 2013	WBRFMP24	152	DC	23/03/2013	50.1707306	-1.258322	50.1699559	-1.258975	77	0:10
WBRF 2013	WBRFMP27	154	DC	23/03/2013	50.2092015	-1.222325	50.2099251	-1.221653	92	0:10
WBRF 2013	WBRFLP08	155	DC	23/03/2013	50.2082	-1.154513	50.2087471	-1.153378	79	0:10
WBRF 2013	WBRFMP29	157	DC	23/03/2013	50.2476676	-1.189975	50.2476475	-1.188466	62	0:10
WBRF 2013	WBRFMP25	159	DC	23/03/2013	50.2478011	-1.260039	50.2478184	-1.257731	62	0:18
WBRF 2013	WBRFMP20	161	DC	24/03/2013	50.2474268	-1.330094	50.247868	-1.328742	57	0:11
WBRF 2013	WBRFHP30	163	DC	24/03/2013	50.2092728	-1.43319	50.2086872	-1.435111	60	0:30
WBRF 2013	ADDGT16	166	DC	24/03/2013	50.394435	-1.615986	50.3943363	-1.614678	47	0:10
WBRF 2013	ADDGT17	168	DC	24/03/2013	50.3863397	-1.583555	50.3872859	-1.581593	50	0:10
WBRF 2013	ADDGT18	171	DC	24/03/2013	50.3899406	-1.56571	50.3894901	-1.564094	45	0:13
WBRF 2013	ADDGT20	173	DC	24/03/2013	50.3774791	-1.557177	50.3769696	-1.558386	49	0:11
WBRF 2013	ADDGT19	175	DC	24/03/2013	50.3745593	-1.58098	50.374522	-1.582629	48	0:11
WBRF 2013	ADDGT21	177	DC	24/03/2013	50.3722596	-1.622891	50.3719694	-1.624314	57	0:10
WBRF 2013	ADDGT07	179	DC	24/03/2013	50.3267188	-1.636547	50.3260501	-1.637589	61	0:11
WBRF 2013	ADDGT06	181	DC	24/03/2013	50.3260916	-1.698698	50.3258081	-1.700172	55	0:12
WBRF 2013	ADDGT05	184	DC	25/03/2013	50.3277252	-1.794469	50.326285	-1.795878	57	0:20
WBRF 2013	ADDGT04	186	DC	25/03/2013	50.3276172	-1.851164	50.326639	-1.847786	61	0:28
WBRF 2013	ADDGT09	188	DC	25/03/2013	50.2957946	-1.884745	50.2974864	-1.887643	58	0:30
WBRF 2013	ADDGT10	190	DC	25/03/2013	50.287779	-1.87922	50.2879022	-1.877421	58	0:13
WBRF 2013	ADDGT11	192	DC	25/03/2013	50.2789752	-1.877727	50.2809466	-1.875815	64	0:29
WBRF 2013	ADDGT12	193	DC	25/03/2013	50.2986558	-1.936017	50.298439	-1.939641	58	0:28

Survey	Stn Code	Stn Num	Gear	Date	SOL Lat	SOL Long	EOL Lat	EOL Long	Water depth	Duration
WBRF 2013	WBRFHP02	195	DC	25/03/2013	50.2464065	-1.961014	50.2463832	-1.959347	61	0:12
WBRF 2013	WBRFHP06	197	DC	25/03/2013	50.2477459	-1.890682	50.2468846	-1.890824	59	0:16
WBRF 2013	WBRFHP08	199	DC	25/03/2013	50.2091068	-1.854804	50.2086366	-1.855472	61	0:06
WBRF 2013	WBRFHP10	201	DC	25/03/2013	50.2471994	-1.819567	50.247025	-1.820891	60	0:10
WBRF 2013	WBRFHP12	203	DC	25/03/2013	50.2082521	-1.783749	50.2083555	-1.785296	61	0:12
WBRF 2013	WBRFHP15	206	DC	25/03/2013	50.2476918	-1.749138	50.2473836	-1.750346	58	0:09
WBRF 2013	WBRFHP17	208	DC	25/03/2013	50.2082812	-1.713577	50.2084704	-1.714908	62	0:10
WBRF 2013	WBRFHP14	210	DC	25/03/2013	50.1693318	-1.751242	50.1696602	-1.749915	64	0:10
WBRF 2013	ADDGT24	214	DC	25/03/2013	50.1904925	-1.683138	50.1901218	-1.684295	62	0:10
WBRF 2013	ADDGT22	216	DC	25/03/2013	50.1830408	-1.648853	50.18287	-1.650422	65	0:12
WBRF 2013	ADDGT23	218	DC	26/03/2013	50.1874384	-1.635089	50.1881514	-1.63432	68	0:10
WBRF 2013	ADDGT25	220	DC	26/03/2013	50.1837517	-1.617864	50.1843941	-1.619682	63	0:15
WBRF 2013	WBRFHP21	221	DC	26/03/2013	50.2096514	-1.643823	50.208684	-1.64455	60	0:11
WBRF 2013	WBRFHP24	223	DC	26/03/2013	50.2088453	-1.573387	50.2088464	-1.574726	61	0:11
WBRF 2013	WBRFHP27	225	DC	26/03/2013	50.2088964	-1.502983	50.2089802	-1.504615	60	0:13
WBRF 2013	ADDGT27	230	DC	26/03/2013	50.1669028	-1.509	50.1668277	-1.510515	80	0:11
WBRF 2013	ADDGT28	232	DC	26/03/2013	50.1806314	-1.515874	50.1797283	-1.51742	77	0:17
WBRF 2013	ADDGT26	234	DC	26/03/2013	50.1673195	-1.574731	50.1662344	-1.57561	69	0:14
WBRF 2013	ADDGT30	236	DC	26/03/2013	50.1780092	-1.61269	50.179291	-1.612516	67	0:15
WBRF 2013	ADDGT31	238	DC	26/03/2013	50.1750217	-1.670334	50.1749022	-1.670424	64	0:01
WBRF 2013	ADDGT42	240	DC	26/03/2013	50.1598067	-1.391966	50.1610069	-1.393236	78	0:15
WBRF 2013	ADDGT45	242	DC	26/03/2013	50.1631383	-1.435479	50.1621261	-1.436081	81	0:12
WBRF 2013	ADDGT44	244	DC	26/03/2013	50.1539094	-1.464425	50.1530513	-1.464504	71	0:10
WBRF 2013	ADDGT47	246	DC	26/03/2013	50.1660672	-1.455752	50.1669463	-1.455103	93	0:12
WBRF 2013	ADDGT46	248	DC	26/03/2013	50.1688181	-1.439054	50.1681128	-1.440237	86	0:16
WBRF 2013	ADDGT43	250	DC	27/03/2013	50.1590151	-1.463475	50.1588621	-1.465453	78	0:15
WBRF 2013	ADDGT39	252	DC	27/03/2013	50.1747186	-1.436903	50.1757876	-1.437682	84	0:13
WBRF 2013	ADDGT38	254	DC	27/03/2013	50.181171	-1.427648	50.1813758	-1.429498	79	0:12
WBRF 2013	ADDGT41	256	DC	27/03/2013	50.1780616	-1.421999	50.1791876	-1.420865	84	0:17
WBRF 2013	ADDGT40	258	DC	27/03/2013	50.1827152	-1.396724	50.184092	-1.340944	91	0:52
WBRF 2013	ADDGT32	260	DC	27/03/2013	50.184063	-1.34086	50.1819651	-1.339141	67	0:26
WBRF 2013	ADDGT29	262	DC	27/03/2013	50.2128121	-1.209242	50.2118758	-1.210828	70	0:16
WBRF 2013	ADDGT33	264	DC	27/03/2013	50.2354084	-1.176644	50.2342533	-1.177553	65	0:14
WBRF 2013	WBRFMP32	266	DC	27/03/2013	50.2480967	-1.117078	50.247376	-1.118092	63	0:12
WBRF 2013	WBRFHP41	268	DC	27/03/2013	50.2095199	-1.082446	50.208733	-1.083361	84	0:11
WBRF 2013	WBRFHP44	270	DC	27/03/2013	50.2481081	-1.048973	50.2477841	-1.048129	75	0:11
WBRF 2013	ADDGT51	272	DC	27/03/2013	50.3552026	-1.117481	50.3542611	-1.115934	53	0:16
WBRF 2013	ADDGT49	274	DC	27/03/2013	50.3518377	-1.081992	50.3506831	-1.082018	67	0:14
WBRF 2013	ADDGT48	280	DC	27/03/2013	50.3596993	-1.084735	50.3585289	-1.084494	50	0:14
WBRF 2013	ADDGT50	282	DC	27/03/2013	50.3554174	-1.060919	50.355127	-1.059053	56	0:15
WBRF 2013	ADDGT37	284	DC	27/03/2013	50.3706434	-1.042962	50.3716012	-1.042635	51	0:11

Survey	Stn Code	Stn Num	Gear	Date	SOL Lat	SOL Long	EOL Lat	EOL Long	Water depth	Duration
WBRF 2013	ADDGT36	286	DC	27/03/2013	50.3662449	-1.119105	50.3670787	-1.119376	53	0:10
BSSS 2013	BSSSAddGT1	343	CS	29/03/2013	50.58379129	0.9782437	50.58451528	0.9791199	24	0:11
BSSS2013	BSSSAddGT10	336	CS	29/03/2013	50.59051795	1.005149	50.59087604	1.0097144	24	0:10
BSSS 2013	BSSSAddGT2	323	CS	29/03/2013	50.58025933	0.9735447	50.57975845	0.972089	37	0:11
BSSS 2013	BSSSAddGT2	370	CS	30/03/2013	50.57953413	0.968912	50.57967886	0.9703278	24	0:09
BSSS 2013	BSSSAddGT8	339	CS	29/03/2013	50.58740251	0.9911684	50.58773253	0.9927554	23	0:11
BSSS 2013	BSSSS02	435	CS	31/03/2013	50.54841107	0.8990053	50.54802358	0.8976432	42	0:10
BSSS 2013	BSSSS110	396	CS	30/03/2013	50.63881361	1.1050683	50.63973866	1.1055787	15	0:10
BSSS 2013	BSSSS111	405	CS	31/03/2013	50.65426496	1.0992049	50.65351772	1.0979509	49	0:12
BSSS 2013	BSSSS117	399	CS	30/03/2013	50.65003512	1.1221253	50.65099795	1.1220708	31	0:10
BSSS 2013	BSSSS12	295	CS	29/03/2013	50.55400603	0.92738707	50.55379689	0.92596777	40	0:11
BSSS 2013	BSSSS120	401	CS	30/03/2013	50.65609843	1.1238948	50.66241676	1.1378946	39	0:04
BSSS 2013	BSSSS24	318	CS	29/03/2013	50.56531506	0.9427498	50.56502721	0.9404657	36	0:10
BSSS 2013	BSSSS25	350	CS	29/03/2013	50.56420646	0.9498593	50.57943904	0.9336254	36	0:11
BSSS 2013	BSSSS33	298	CS	29/03/2013	50.55245465	0.9595279	50.55256621	0.9601758	39	0:04
BSSS 2013	BSSSS36	356	CS	29/03/2013	50.59804296	0.9416625	50.59757741	0.9405427	39	0:11
BSSS 2013	BSSSS39	321	CS	29/03/2013	50.57682488	0.9599582	50.57631919	0.9569004	35	0:14
BSSS 2013	BSSSS39	369	CS	30/03/2013	50.57889034	0.9448325	50.57686723	0.9571093	31	0:11
BSSS 2013	BSSSS40	358	CS	29/03/2013	50.59147862	0.9507932	50.59094965	0.9496864	47	0:10
BSSS 2013	BSSSS44	313	CS	29/03/2013	50.56959585	0.9714105	50.57015297	0.9691091	36	0:12
BSSS 2013	BSSSS50	301	CS	29/03/2013	50.55781194	0.9867595	50.55813842	0.9880488	39	0:12
BSSS 2013	BSSSS55	362	CS	30/03/2013	50.59753323	0.9790511	50.59706187	0.9779519	43	0:11
BSSS 2013	BSSSS58	309	CS	29/03/2013	50.57450696	0.9906418	50.57527139	0.9926581	35	0:11
BSSS 2013	BSSSS69	365	CS	30/03/2013	50.60291632	1.0052955	50.60230781	1.00421	43	0:10
BSSS 2013	BSSSS71	306	CS	29/03/2013	50.57967085	1.0152256	50.58035801	1.0172378	33	0:10
BSSS 2013	BSSSS72	331	CS	29/03/2013	50.59615054	1.01268442	50.59626793	1.01469497	27	0:11
BSSS 2013	BSSSS80	385	CS	30/03/2013	50.59141904	1.03731503	50.59226166	1.037987	25	0:10
BSSS 2013	BSSSS84	378	CS	30/03/2013	50.61687112	1.0366652	50.61664547	1.0354504	35	0:10
BSSS 2013	BSSSS85	387	CS	30/03/2013	50.59462808	1.0511769	50.59537538	1.0520726	29	0:10
BSSS 2013	BSSSS91	391	CS	30/03/2013	50.61252571	1.057203	50.61317279	1.0583247	21	0:11
BSSS 2013	BSSSS92	376	CS	30/03/2013	50.62830372	1.0521772	50.62776371	1.0509869	43	0:10
BSSS 2013	BSSSS98	413	CS	31/03/2013	50.62575854	1.07463501	50.62500143	1.0749661	23	0:11
BSSS 2013	BSSSS99	374	CS	30/03/2013	50.63923262	1.0661786	50.63944146	1.0674926	51	0:10

Cefas

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