

Survey Report (Project Code): C5785K

Farnes East rMCZ 2014 Survey Report

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1 Background and Introduction

1.1 Survey Project Team

The Farnes East rMCZ survey was carried out during 14th -15th March 2014 on the RV *CEFAS Endeavour* (cruise code CEND0514). The survey team for the duration of the fieldwork included Cefas marine ecologists, marine surveyors and GIS specialists along with MPA specialists from the JNCC.

1.2 Site Description

The Farnes East rMCZ is located in the North Sea approximately 11 km off the Northumberland Coast and has a depth range of 30 – 100m (Figure 1). The area was previously surveyed in 2012 by Cefas (cruise code CEND0412), to collect sediment samples and seabed imagery, and by EGS, to collect Multi Beam Echo Sounder data following a Defra funded invitation to tender exercise.

The purpose of these surveys was to provide direct evidence of the presence and extent of the broadscale habitats (BSH) and habitat FOCI (Features of Conservation Importance) that had been detailed in the Site Assessment Document (SAD), (Net Gain, 2011). The updated BSH map, which was based on the newly acquired data and presented in the site report, confirmed the presence of all five BSH originally recommended for designation in the SAD. However, the extent of 'A4.2 Moderate energy circalittoral rock' was identified to be much less than that provided in the SAD and also the Habitat FOCI 'Peat and Clay Exposures' was not observed during the 2012 survey (Table 1 & Figure 2).

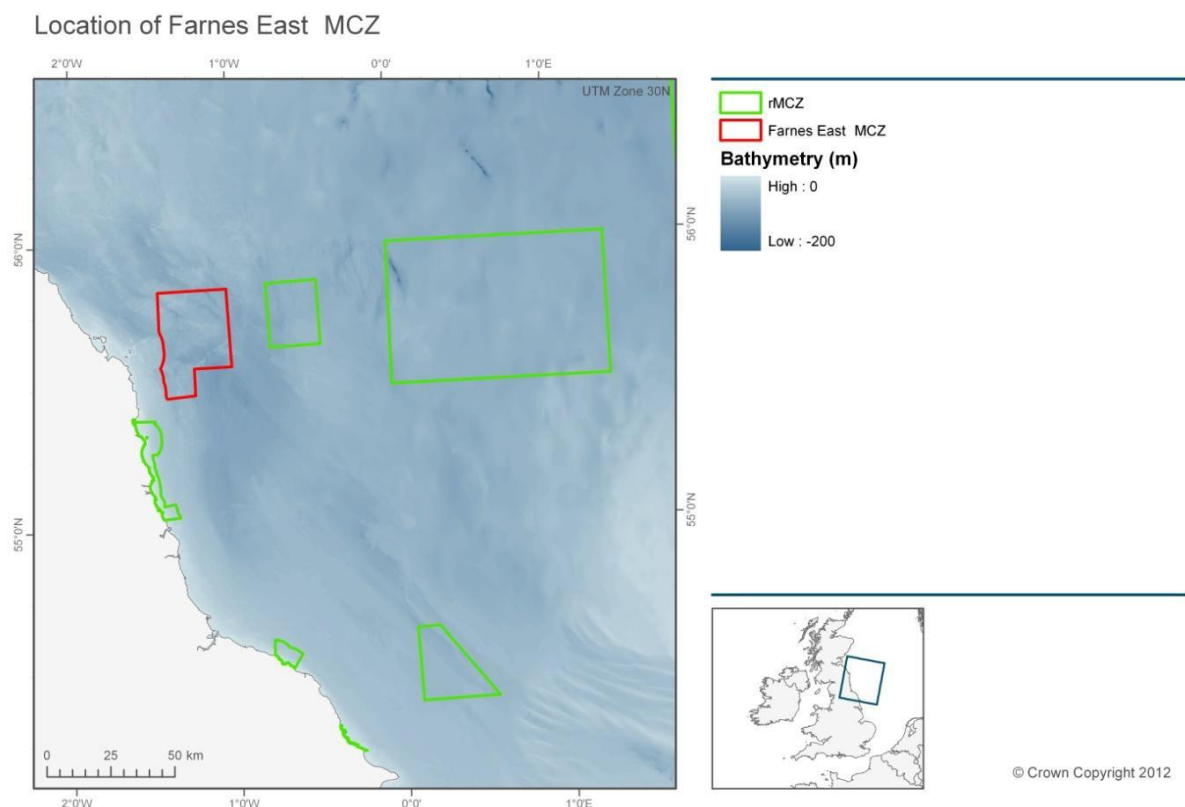


Figure 1. Location of Farnes East MCZ [Bathymetry is from the Defra Digital Elevation Model (Astrium, 2011)].

Table 1. Features proposed in the SAD for inclusion within the rMCZ designation (Eggleton *et al.*, 2013).

Feature	Extent according to SAD	Extent according to updated habitat map	Accord between SAD and updated habitat map	
			Presence	Extent
Broadscale Habitats (BSH)				
A4.2: Moderate energy circalittoral rock	517.59 km ²	17.84 km ² *	<input type="checkbox"/>	-499.75 km ²
A5.1: Subtidal coarse sediment	247.32 km ²	189.97 km ²	<input type="checkbox"/>	-57.35 km ²
A5.2: Subtidal sand	177.59 km ²	190.65 km ²	<input type="checkbox"/>	+13.06 km ²
A5.3: Subtidal mud	13.22 km ²	122.16 km ²	<input type="checkbox"/>	+108.94 km ²
A5.4: Subtidal mixed sediments	3.31 km ²	422.94 km ²	<input type="checkbox"/>	+419.63 km ²
Habitat FOCI				
Peat and Clay Exposures	4.05 km ²	Not found	<input type="checkbox"/>	-4.05 km ²
Species FOCI				
None proposed	N/A	N/A	N/A	N/A

Updated Broadscale Habitat Map

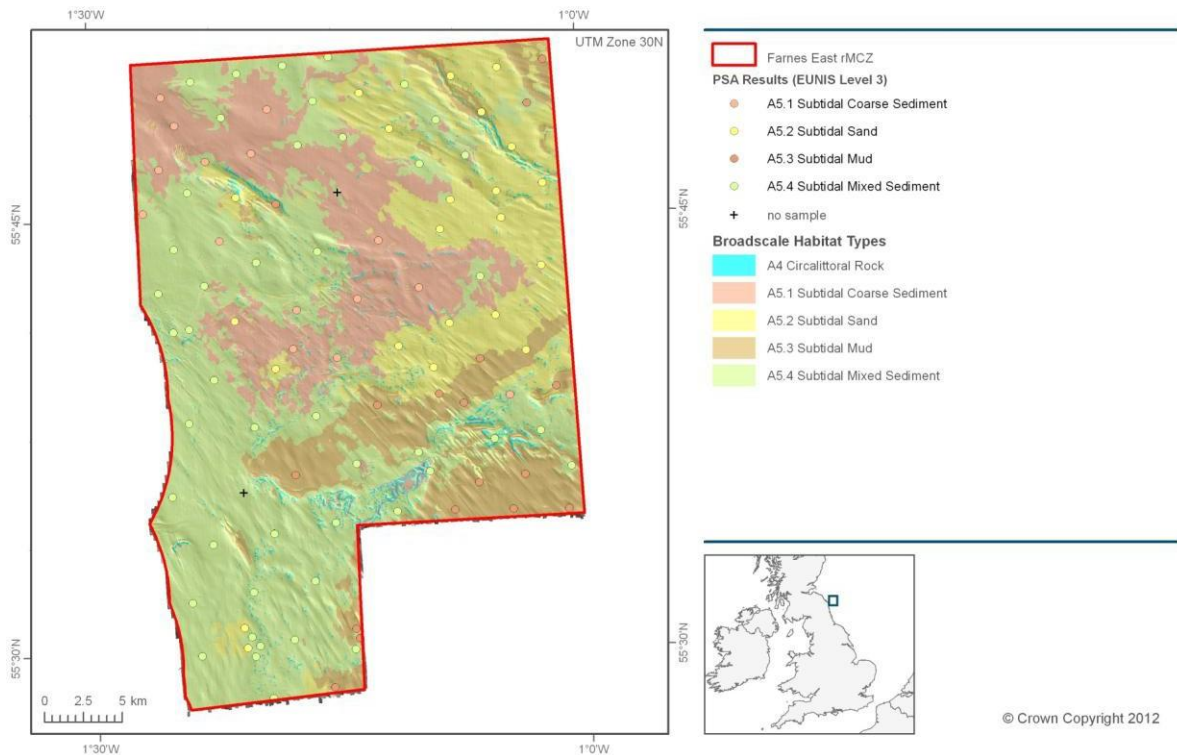


Figure 2. Updated habitat map of broadscale habitats based on newly acquired data (Eggleton *et al.*, 2013).

1.3 Existing data and information utilised to inform survey planning

The initial ground truth survey at the Farnes East rMCZ was carried out onboard RV Cefas Endeavour (cruise CEND0412) during March 2012 (Whomersley *et al.* 2012). As the acoustic survey was being run concurrently, the outputs were not available to inform the selection of ground-truth stations.

Instead, the selection and positioning of ground-truth stations was informed by a combination of the predicted extent of broadscale habitats derived from the UK SeaMap 2010 (v7) and the habitat map provided in the Site Assessment Document (SAD).

The northeast portion of the Farnes East rMCZ overlapped with an area of existing MBES

bathymetry data acquired by the Maritime and Coastguard Agency (MCA) under the Civil Hydrographic Programme (CHP). Full coverage MBES bathymetry and backscatter data were acquired for most of the remainder of the site by EGS (International) Ltd during February/March 2012, using a Reson 7125 system on the MV *Neptune* (Briggs, 2012). The bathymetric survey was conducted in accordance with IHO Standard Order 1a, and MBES backscatter data were acquired following guidelines developed and provided by Cefas.

A return survey to ground-truth the areas of modelled rock and the potential habitat FOCI 'Peat and Clay Exposures' was proposed and the survey scheduled for two days during a RV *Cefas Endeavour* survey in March 2014, cruise code CEND0514.

2 Survey Design and Methods

2.1 Survey planning and design

Initially the updated BSH map was used to identify three areas where 'A4.2 Moderate energy circalittoral rock was predicted to occur'. In addition, one of these areas was coincident with a record of the habitat FOCI 'Peat and Clay Exposures' (Figure 3). These stations were repositioned during the survey to better coincide with the underlying bathymetric and MBES backscatter processed data.

There was no requirement to acquire additional MBES data during this survey.

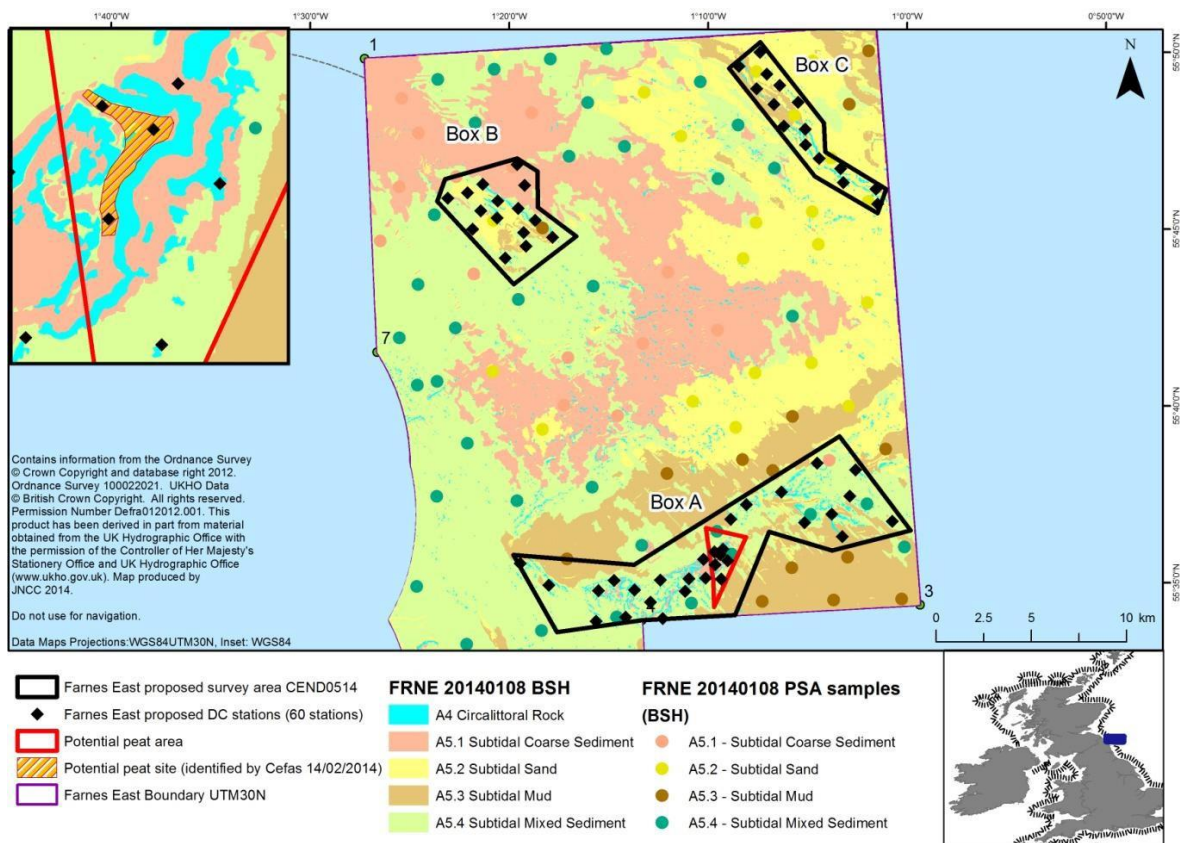


Figure 3. Planned groundtruthing stations based on updated broadscale habitat map.

2.2 Sample collection and processing methods

2.2.1 Seabed imagery 'A4.2 Moderate energy circalittoral rock' and Habitat FOCI 'Peat and Clay Exposures'

A frame mounted 'drop' camera system was identified as the appropriate video acquisition gear due to the potential of encountering bedrock and 'stony' reef. The drop camera (DC) frame comprised of lighting, a stills camera, with capability to also capture video footage, a synchronised flash unit for the capture of high resolution still images and a Ultra Short Base Line (USBL) beacon to geo reference the imagery collected (Figure 4). The field of view was illuminated using a suite of Cefas high intensity LED strip-lights and the camera underwater housing was fitted with a four-spot laser-scaling device to provide a reference scale in the video footage and digital still images. Set-up and operation followed the MESH 'Recommended Operating Guidelines (ROG) for underwater video and photographic imaging techniques' and the Cefas operating procedure for seabed imagery acquisition. Video was recorded simultaneously to a Sony GV-HD700 DV tape recorder and a computer hard drive (in duplicate). A video overlay was used to provide station metadata, time and GPS position (of the vessel) in the recorded video footage.



Figure 4. Drop camera frame with video and still imaging system and USBL beacon

Camera tows lasted a minimum of 10 minutes with the DC being towed at ~ 0.3 knots ($\sim 0.2 \text{ ms}^{-1}$) across a 100 m diameter 'bullring' centred on the target sampling station. Stills images were captured at approximately one-minute intervals and opportunistically when specific FOCI/changes in BSH were encountered. The DC was controlled by a winch operator with sight of the video monitor and the orientation of the tow was determined, before arriving on station, through analysis of the seabed bathymetry and MBES backscatter.

2.2.2 Sediment sampling

A 0.1m² mini Hamon grab (Figure 5) was used to collect sediment samples for infaunal community and sediment Particle Size Analysis (PSA) from stations with potential 'Peat and Clay Exposures' (Figure 3). Each valid sample was photographed before taking a sub sample (approx 0.5lt) of the sediment for subsequent PSA back at the laboratory. The remaining sediment was sieved over a 5mm screening mesh and 1mm capture sieve in order to remove the less than one mm sediment fraction from the infauna sample while maintaining the integrity of the animals within. Each fraction was photographed before being combined and fixed in buffered 10% formalin.

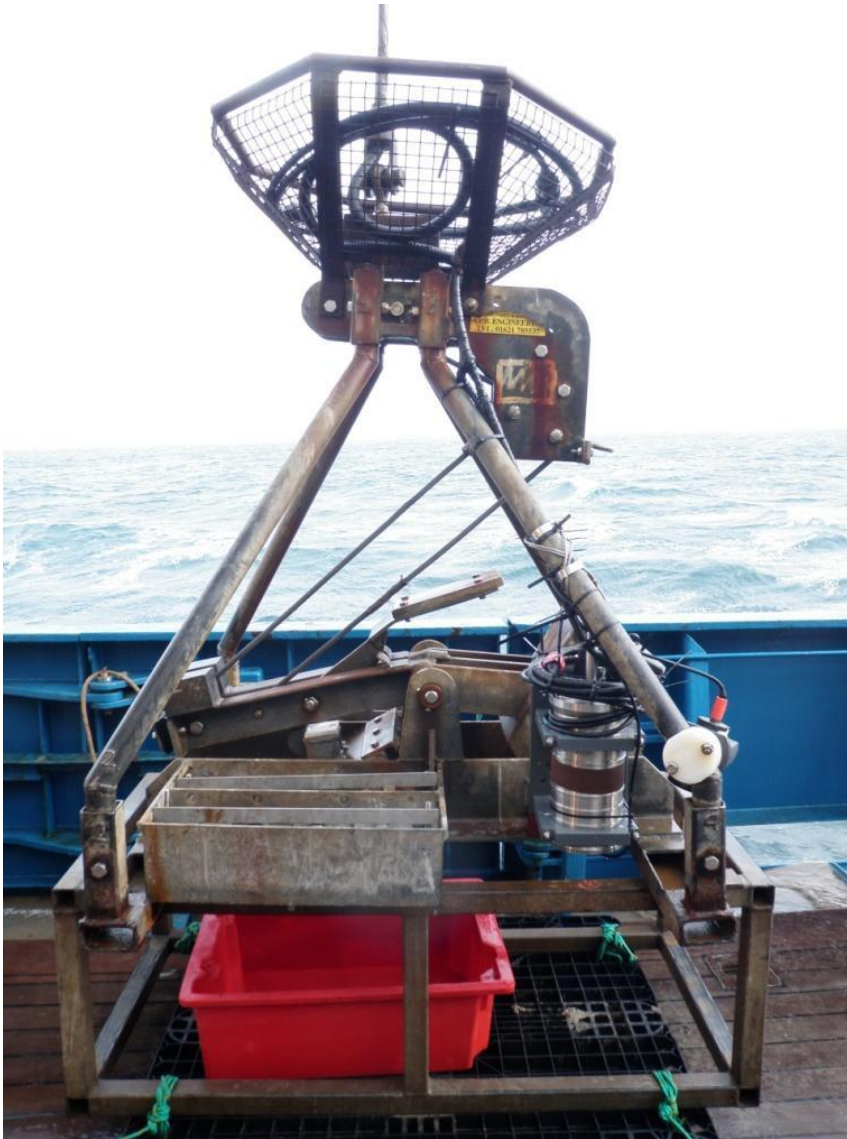


Figure 5. A mini Hamon grab (surface area 0.1m²) fitted with video capture system and USBL.

3 Survey Narrative

A toolbox talk detailing the safe deployment and recovery of the Drop camera frame was given to survey staff on arriving at the Farnes East MCZ at 14:00 on the 14th March 2014, prior to commencing the survey with a successful DC deployment at station A06. The initial ground-truthing target positions were amended during the survey to better coincide with the bathymetric and MBES backscatter features underpinning the updated BSH map produced for the Site report (Eggleton *et al*, 2013). DC sampling in Box A was completed at 11:00 on the 15th March 2014. Three stations (A25, A26 and A27), where the habitat FOCI 'Peat and Clay Exposures' was referred to as potentially present in the SAD, were selected for sediment sampling using the mini Hamon following a review of the geo referenced digital still images from the DC tows at each station. The mini Hamon grab was deployed at target positions coincident to where the seabed imagery indicated the presence of the habitat FOCI 'Peat and Clay Exposures' Following the successful completion of three grab stations the vessel transited to the next suite of DC stations.

The survey of Farnes East was completed at 10:36 on 16th March 2014 and resulted in the successful collection of 56 drop camera video tows with 787 geo-referenced digital still images plus three additional infauna samples with associated sediment subsample for PSA. Stations A12, C03, C10 & C13 were omitted from the DC survey following review of the bathymetry and MBES backscatter and their proximity to already completed stations, with similar MBES signatures.

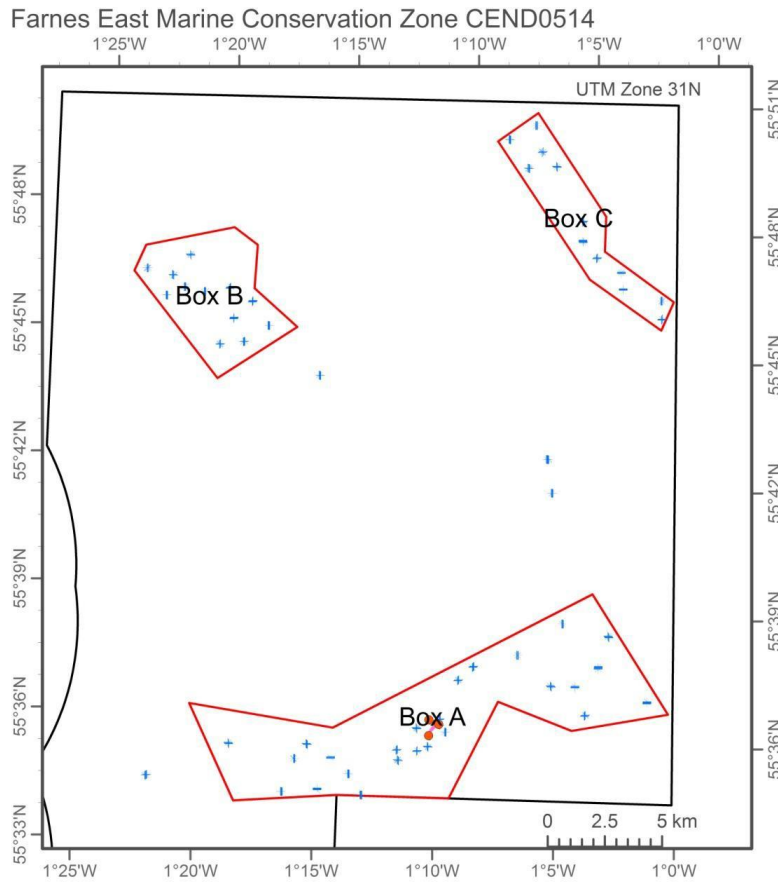
4 Preliminary Results

4.1 *Acoustic survey*

No additional acoustic data were acquired during the CEND0514 survey.

4.2 *Seabed imagery*

56 successful tows with 787 associated still images were collected from 56 stations using the drop frame mounted digital stills camera (Figure 6). Representative images from each video tow are presented in Appendix 6.1. A complete analysis of the seabed imagery will better describe the physical environment and faunal community present at each station.



- Farnes East MCZ
- Survey Boxes
- Drop camera tows
- Sediment sampling stations
- Potential 'Peat and Clay Exposures'



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Figure 6. Ground truth samples collected during CEND0514.

4.3 Sediment sampling

Three sediment samples were collected from the potential peat and clay exposure area for infauna and particle size distribution analyses (Figure 6). All three stations were initially classified as mixed sediments however a full laboratory analysis will provide more robust classification. Station A27 was noted as having 'mudstone' present, as seen in Figure 7.



Figure 7. Sediment retained on the 5mm screening mesh at station A27, with 'mudstone' present.

5 References

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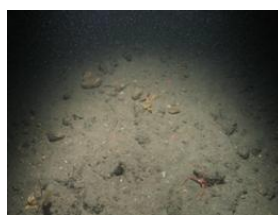



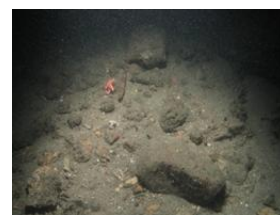


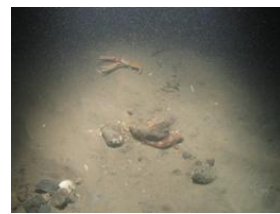






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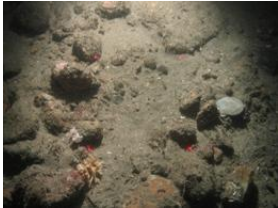
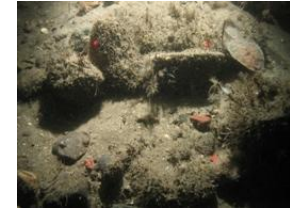

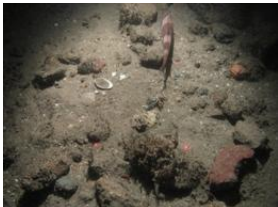
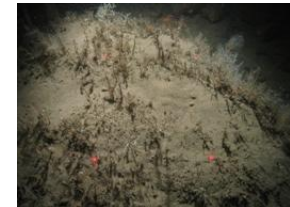
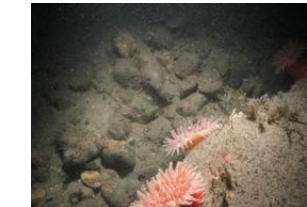



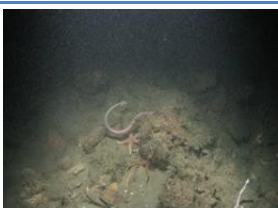
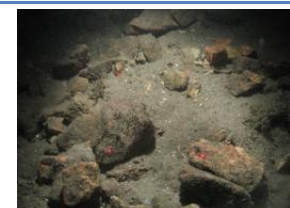
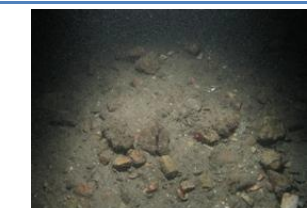


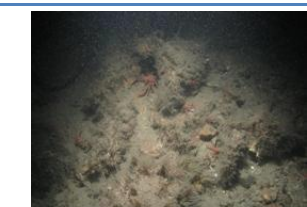

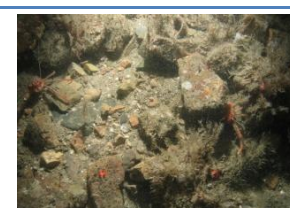
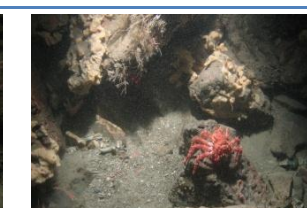
Net Gain. 2011. Final Recommendations Submission to Natural England and JNCC, Version 1.1. 880 pp.



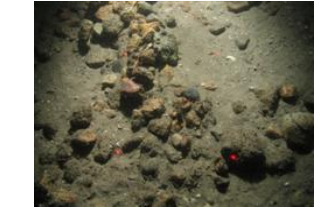














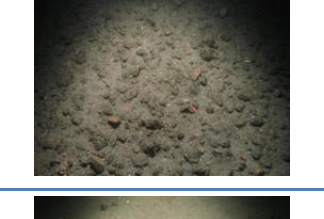
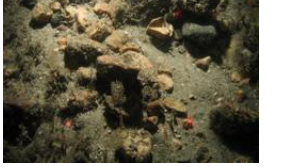


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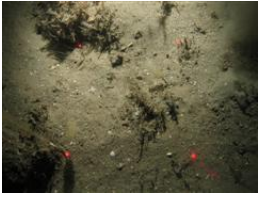
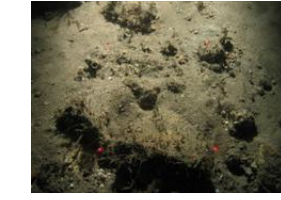
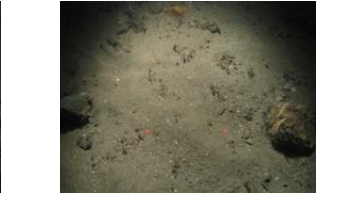
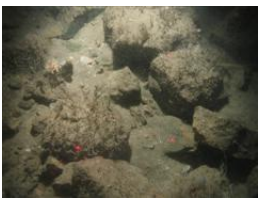



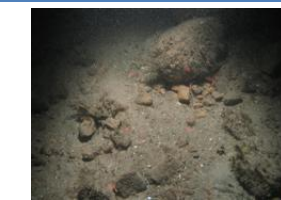
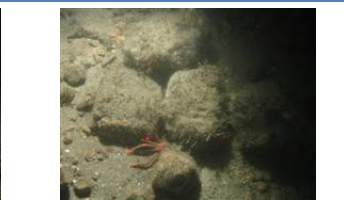


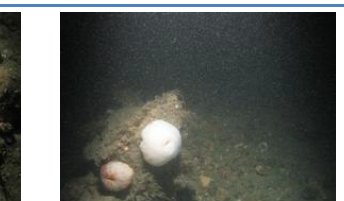


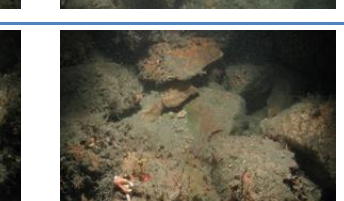

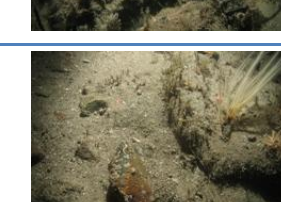
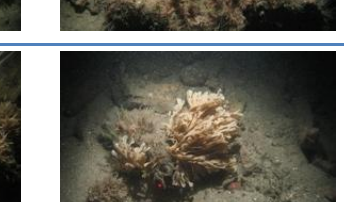
6 Annexes





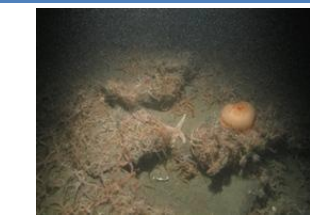



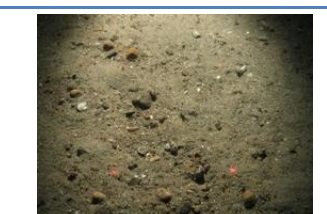
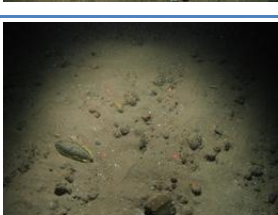

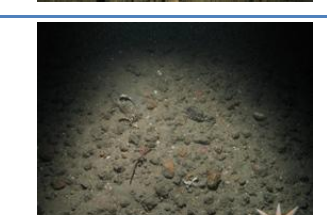
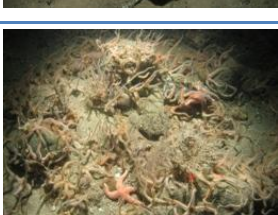
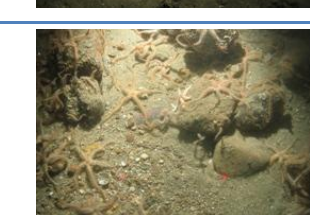
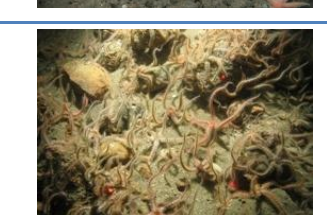

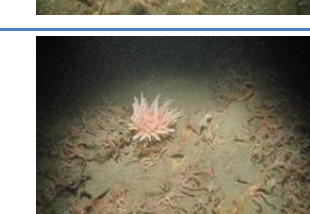
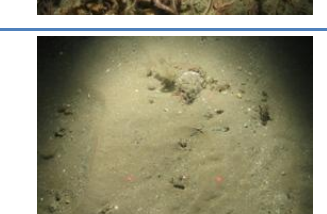

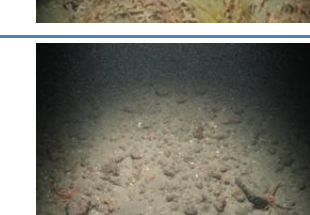
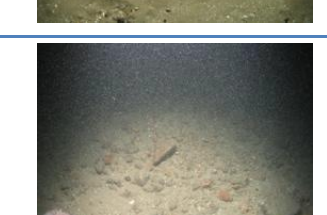
6.1 Representative images from drop camera deployments

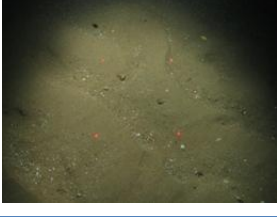
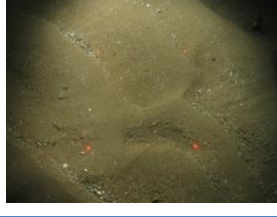
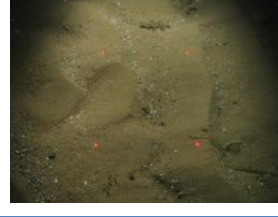
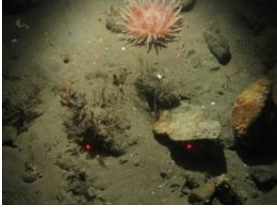











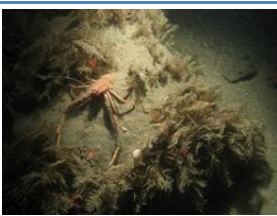
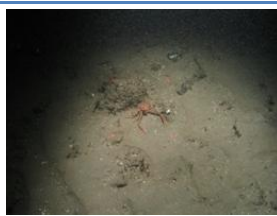


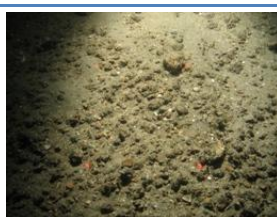

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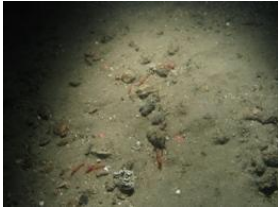
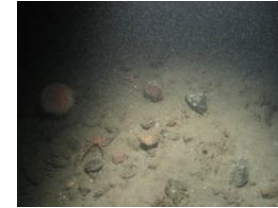
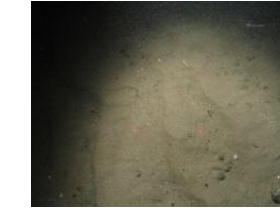
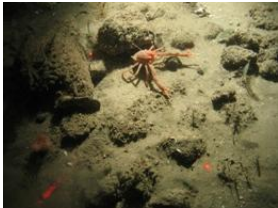
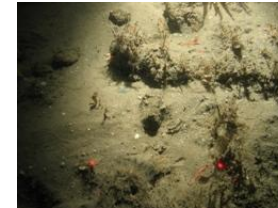
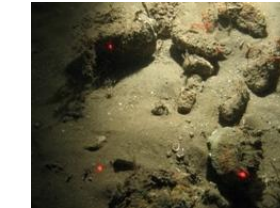




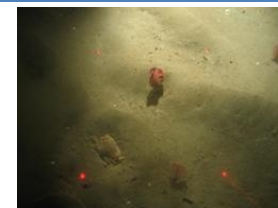
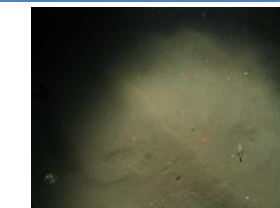



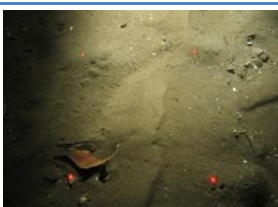
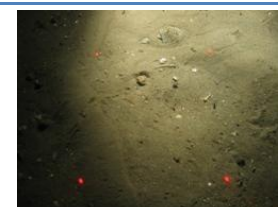


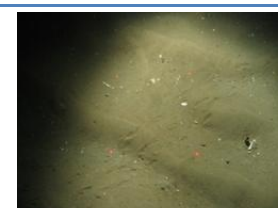
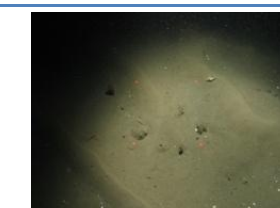
Station Code	Representative image 1	Representative image 2	Representative image 3
FRNE_CEND0514_A03_ STN_007_A1			
FRNE_CEND0514_A09_ STN_008_A1			
FRNE_CEND0514_A02_ STN_009_A1			
FRNE_CEND0514_A01_ STN_010_A1			
FRNE_CEND0514_A29_ STN_011_A1			
FRNE_CEND0514_A25_ STN_012_A1			
FRNE_CEND0514_A26_ STN_013_A1			

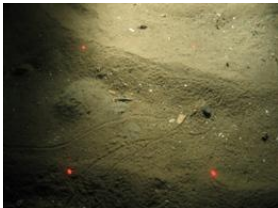



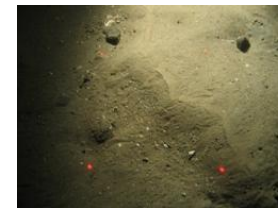

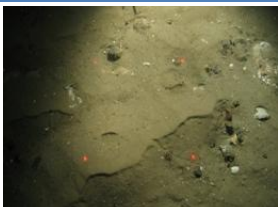


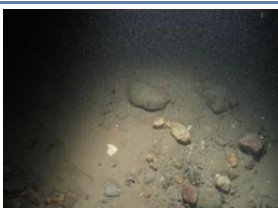





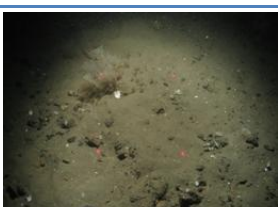

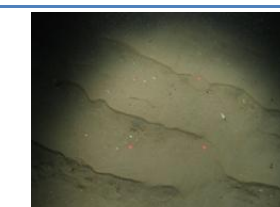


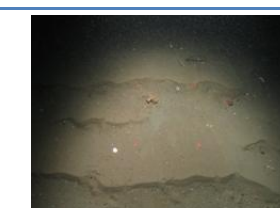
Station Code	Representative image 1	Representative image 2	Representative image 3
FRNE_CEND0514_A10_ STN_014_A1			
FRNE_CEND0514_A30_ STN_015_A1			
FRNE_CEND0514_A27_ STN_016_A1			
FRNE_CEND0514_A11_ STN_017_A1			
FRNE_CEND0514_A22_ STN_018_A1			
FRNE_CEND0514_A28_ STN_019_A1			
FRNE_CEND0514_A20_ STN_020_A1			




Station Code	Representative image 1	Representative image 2	Representative image 3
FRNE_CEND0514_A19_ STN_021_A1			
FRNE_CEND0514_A21_ STN_022_A1			
FRNE_CEND0514_A13_ STN_023_A1			
FRNE_CEND0514_A24_ STN_024_A1			
FRNE_CEND0514_A14_ STN_025_A1			
FRNE_CEND0514_A18_ STN_026_A1			
FRNE_CEND0514_A17_ STN_027_A1			

Station Code	Representative image 1	Representative image 2	Representative image 3
FRNE_CEND0514_A16_ STN_028_A1			
FRNE_CEND0514_A15_ STN_029_A1			
FRNE_CEND0514_B15_ STN_033_A1			
FRNE_CEND0514_B09_ STN_034_A1			
FRNE_CEND0514_B11_ STN_035_A1			
FRNE_CEND0514_B10_ STN_036_A1			
FRNE_CEND0514_B12_ STN_037_A1			










Station Code	Representative image 1	Representative image 2	Representative image 3
FRNE_CEND0514_B07_ STN_038_A1			
FRNE_CEND0514_B06_ STN_039_A1			
FRNE_CEND0514_B05_ STN_040_A1			
FRNE_CEND0514_B04_ STN_041_A1			
FRNE_CEND0514_B13_ STN_042_A1			
FRNE_CEND0514_B03_ STN_043_A1			
FRNE_CEND0514_B14_ STN_044_A1			

Station Code	Representative image 1	Representative image 2	Representative image 3
FRNE_CEND0514_B01_ STN_045_A1			
FRNE_CEND0514_B08_ STN_046_A1			
FRNE_CEND0514_B02_ STN_047_A1			
FRNE_CEND0514_C01_ STN_048_A1			
FRNE_CEND0514_C12_ STN_049_A1			
FRNE_CEND0514_C15_ STN_050_A1			
FRNE_CEND0514_C02_ STN_051_A1			

Station Code	Representative image 1	Representative image 2	Representative image 3
FRNE_CEND0514_C11_ STN_052_A1			
FRNE_CEND0514_C09_ STN_053_A1			
FRNE_CEND0514_C14_ STN_054_A2			
FRNE_CEND0514_C08_ STN_055_A1			
FRNE_CEND0514_C07_ STN_056_A1			
FRNE_CEND0514_C04_ STN_057_A1			
FRNE_CEND0514_C06_ STN_058_A1			

Station Code	Representative image 1	Representative image 2	Representative image 3
FRNE_CEND0514_C05_ STN_059_A1			

6.2 Images taken during deck processing of sediment samples

Station Code	PSA	5mm	1mm
FRNE_CEND0514_A27_ STN_030_A1			
FRNE_CEND0514_A26_ STN_031_A1			
FRNE_CEND0514_A25_ STN_032_A1			

6.3 RV Cefas Endeavour



Port of registry	Lowestoft
Length OA	73.00 m (excluding stern roller)
Length extreme	73.916 m
Breadth (MLD)	15.80 m
Depth (MLD)	8.20 m
Design draft	5.00 m
Deep draught	5.50 m
LBP	66.50 m
Gross tonnage	2983 tonnes
Net register tonnage	894 tonnes
Net lightship	2436 tonnes
Deadweight @ 5.00 m	784 tonnes
Deadweight @ 5.50 m	1244 tonnes
Displacement @ 5.00 m	3210 tonnes
Displacement @ 5.50 m	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	3240 Kw
Power propulsion	2230 Kw
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 35 tM, 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 1.2 m 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 Interling 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

6.4 Drop Camera

Camera model: Kongsberg 208
Flash model: Kongsberg s/n 0105

Underwater lights – 2 x Cefas Technology Ltd high power, hyper terminally controlled LED strip lights.

20v scaling lasers x 4

Camera settings: long line drive on, aperture f5.6, manual focus set to 1m, large, super-fine image and ISO 100.

6.5 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 to the gantry in use. USBL: HiPap.

6.6 Metadata

Station metadata for the Farnes East MCZ survey on cruise CEND0514 are provided below. NB. 'Station Number' is a sequential event number for the cruise which 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. 'HG' = mini Hamon grab and 'DC' = Drop camera. An electronic version of the cruise metadata is available.

Date	Station Number	Station Code	Gear Code	Water Depth (m)	Attempt	Time Sampled or SOL	Time for EOL	Fix	Latitude DD	Longitude DD	Fauna Barcode	Sediment Barcode
15/03/2014	32	A25	HG	81	A1	13:29		4011	55.60417	-1.17409	82244	82245
15/03/2014	31	A26	HG	91	A1	13:12		4010	55.60259	-1.16715	82246	82247
15/03/2014	30	A27	HG	75	A1	12:51		4009	55.59799	-1.17368	82248	82249
14/03/2014	10	A01	DC	85	A1	21:42	21:53	1404	55.62016	-1.15573	N/A	N/A
14/03/2014	9	A02	DC	77	A1	21:06	21:18	1236	55.62589	-1.14558	N/A	N/A
14/03/2014	7	A03	DC	83	A1	19:37	19:47	1020	55.63141	-1.11484	N/A	N/A
14/03/2014	6	A04	DC	80	A1	18:57	19:07	890	55.64471	-1.08510	N/A	N/A
14/03/2014	2	A05	DC	76	A1	15:58	16:10	179	55.64110	-1.05376	N/A	N/A
14/03/2014	1	A06	DC	85	A1	15:07	15:20	60	55.61609	-1.02416	N/A	N/A
14/03/2014	4	A07	DC	97	A1	17:45	17:55	526	55.60972	-1.06587	N/A	N/A
14/03/2014	5	A08	DC	83	A1	18:18	18:29	780	55.62072	-1.07441	N/A	N/A
14/03/2014	8	A09	DC	79	A1	20:17	20:28	1069	55.62014	-1.09131	N/A	N/A
15/03/2014	14	A10	DC	88	A1	00:11	00:21	1861	55.59977	-1.16172	N/A	N/A
15/03/2014	17	A11	DC	78	A1	02:15	02:26	2395	55.60105	-1.18273	N/A	N/A
15/03/2014	23	A13	DC	77	A1	06:17	06:28	3073	55.58684	-1.24025	N/A	N/A
15/03/2014	25	A14	DC	83	A1	08:03	08:14	3343	55.59156	-1.25677	N/A	N/A
15/03/2014	29	A15	DC	76	A1	10:48	11:01	4008	55.57573	-1.36811	N/A	N/A
15/03/2014	28	A16	DC	69	A1	09:56	10:07	3807	55.59022	-1.31141	N/A	N/A
15/03/2014	27	A17	DC	65	A1	09:11	09:22	3664	55.57269	-1.27282	N/A	N/A
15/03/2014	26	A18	DC	68	A1	08:38	08:49	3512	55.58584	-1.26522	N/A	N/A
15/03/2014	21	A19	DC	73	A1	05:13	05:24	2892	55.57325	-1.21814	N/A	N/A
15/03/2014	20	A20	DC	75	A1	04:01	04:13	2794	55.58796	-1.19449	N/A	N/A
15/03/2014	22	A21	DC	77	A1	05:40	05:51	3009	55.58117	-1.22755	N/A	N/A
15/03/2014	18	A22	DC	74	A1	02:51	03:02	2492	55.59170	-1.18111	N/A	N/A
15/03/2014	24	A24	DC	65	A1	07:07	07:19	3279	55.57462	-1.24828	N/A	N/A

14/03/2014	12	A25	DC	81	A1	22:48	22:59	1557	55.60403	-1.17269	N/A	N/A
14/03/2014	13	A26	DC	93	A1	23:23	23:37	1817	55.60244	-1.16633	N/A	N/A
15/03/2014	16	A27	DC	81	A1	01:29	01:41	2208	55.59806	-1.17323	N/A	N/A
15/03/2014	19	A28	DC	79	A1	03:20	03:31	2625	55.59159	-1.19532	N/A	N/A
14/03/2014	11	A29	DC	83	A1	22:14	22:27	1468	55.60482	-1.16621	N/A	N/A
15/03/2014	15	A30	DC	76	A1	00:51	01:02	2058	55.59372	-1.17374	N/A	N/A
16/03/2014	45	B01	DC	75	A1	00:13	00:23	5763	55.77391	-1.38766	N/A	N/A
16/03/2014	47	B02	DC	72	A1	01:35	01:46	6061	55.78039	-1.35884	N/A	N/A
15/03/2014	43	B03	DC	73	A1	22:50	23:00	5580	55.76751	-1.36162	N/A	N/A
15/03/2020	41	B04	DC	73	A1	21:33	21:45	5155	55.76808	-1.32968	N/A	N/A
15/03/2014	40	B04	DC	64	A1	20:56	21:08	4958	55.76382	-1.31336	N/A	N/A
15/03/2014	39	B06	DC	79	A1	20:15	20:27	4940	55.75592	-1.32601	N/A	N/A
15/03/2014	38	B07	DC	77	A1	19:35	19:46	4791	55.74567	-1.33466	N/A	N/A
16/03/2014	46	B08	DC	80	A1	00:57	01:08	5837	55.77165	-1.36913	N/A	N/A
15/03/2014	34	B09	DC	66	A1	15:28	15:42	4151	55.70861	-1.10174	N/A	N/A
15/03/2014	36	B10	DC	74	A1	18:24	18:34	4554	55.75432	-1.30199	N/A	N/A
15/03/2014	35	B11	DC	52	A1	17:45	17:56	4412	55.73631	-1.26471	N/A	N/A
15/03/2014	44	B12	DC	69	A1	23:18	23:28	5689	55.76382	-1.37379	N/A	N/A
15/03/2014	37	B12	DC	66	A1	19:03	19:13	4596	55.74752	-1.31741	N/A	N/A
15/03/2014	42	B13	DC	73	A1	22:13	22:23	5319	55.76609	-1.34760	N/A	N/A
15/03/2014	33	B15	DC	68	A1	14:43	14:54	4104	55.69563	-1.09857	N/A	N/A
16/03/2014	48	C01	DC	101	A1	03:09	03:20	6101	55.83272	-1.14141	N/A	N/A
16/03/2014	51	C02	DC	100	A1	05:14	05:25	6587	55.82199	-1.12828	N/A	N/A
16/03/2014	57	C04	DC	77	A1	09:13	09:24	7331	55.77671	-1.05716	N/A	N/A
16/03/2014	59	C05	DC	75	A1	10:26	10:36	7633	55.76621	-1.02856	N/A	N/A
16/03/2014	58	C06	DC	80	A1	09:55	10:05	7462	55.77307	-1.03009	N/A	N/A
16/03/2014	56	C07	DC	83	A1	08:43	08:53	7214	55.78326	-1.05901	N/A	N/A

16/03/2014	55	C08	DC	87	A1	08:07	08:17	7119	55.78848	-1.07623	N/A	N/A
16/03/2014	53	C09	DC	95	A1	06:32	06:42	6827	55.80205	-1.08804	N/A	N/A
16/03/2014	52	C11	DC	79	A1	05:52	06:02	6695	55.82290	-1.10778	N/A	N/A
16/03/2014	49	C12	DC	76	A1	03:54	04:04	6279	55.83883	-1.12402	N/A	N/A
16/03/2014	54	C14	DC	89	A2	07:13	07:24	7028	55.79385	-1.08673	N/A	N/A
16/03/2014	54	C14	DC	89	A1	07:01	07:05	6875	55.79532	-1.08818	N/A	N/A
16/03/2014	50	C15	DC	79	A1	04:44	04:54	6452	55.82882	-1.11832	N/A	N/A

6.7 Daily Progress Reports

Daily progress reports are available electronically.

6.8 Fisheries Liaison officer (FLO) Report

No Fisheries Liaison Officer was on board and no fishing activity was observed during the survey (CEND0514) within the Farnes East rMCZ.

About us

Cefas is a multi-disciplinary scientific research and consultancy centre providing a comprehensive range of services in fisheries management, environmental monitoring and assessment, and aquaculture to a large number of clients worldwide.

We have more than 500 staff based in 2 laboratories, our own ocean-going research vessel, and over 100 years of fisheries experience.

We have a long and successful track record in delivering high-quality services to clients in a confidential and impartial manner.

(www.cefas.defra.gov.uk)

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CTL systems and services are developed by teams that are experienced in fisheries, environmental management and aquaculture, and in working closely with clients to ensure that their needs are fully met.

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Customer focus

With our unique facilities and our breadth of expertise in environmental and fisheries management, we can rapidly put together a multi-disciplinary team of experienced specialists, fully supported by our comprehensive in-house resources.

Our existing customers are drawn from a broad spectrum with wide ranging interests. Clients include:

- international and UK government departments
- the European Commission
- the World Bank
- Food and Agriculture Organisation of the United Nations (FAO)
- oil, water, chemical, pharmaceutical, agro-chemical, aggregate and marine industries
- non-governmental and environmental organisations
- regulators and enforcement agencies
- local authorities and other public bodies

We also work successfully in partnership with other organisations, operate in international consortia and have several joint ventures commercialising our intellectual property

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