Report on elements of Cefas Cruise CEND 14/06 relating to Cefas project C2282 (MEPF 04/01) 'Eastern English Channel Large-scale Seabed Habitat Map'

Roger Coggan (Cefas)

Cruise CEND 14/06 was conducted on the RV *Cefas Endeavour* between 13th July and 9th August 2006, and was split into 3 parts as follows:

Part A: 13th July – 20th July
Part B: 20th July – 27th July = **MESH Survey Code: 07-06-01**
Part C: 28th July – 9th Aug

Work relating to the MESH matched finding project C2282 (MEPF 04/01) was conducted during Part B and included specific elements addressing MESH objectives under Action 3 'Testing Standards and Protocols'. This section of the Cruise is the subject of the current report. During Part C, and extensive area south of the Isle of Wight was surveyed for a Defra-funded project (ME1102), including acoustic survey and ground-truthing techniques, providing opportunity to further advance the work on Action 3.

Background

This survey was a continuation of the work on the MEPF 04/01 project entitled 'Eastern English Channel Large-scale Seabed Habitat Map', details of which have been provided previously in the report for the prior ground-truth survey conducted in Activity Period 4 (MESH Survey Code: 07-05-02, Hyperlink to Survey report).

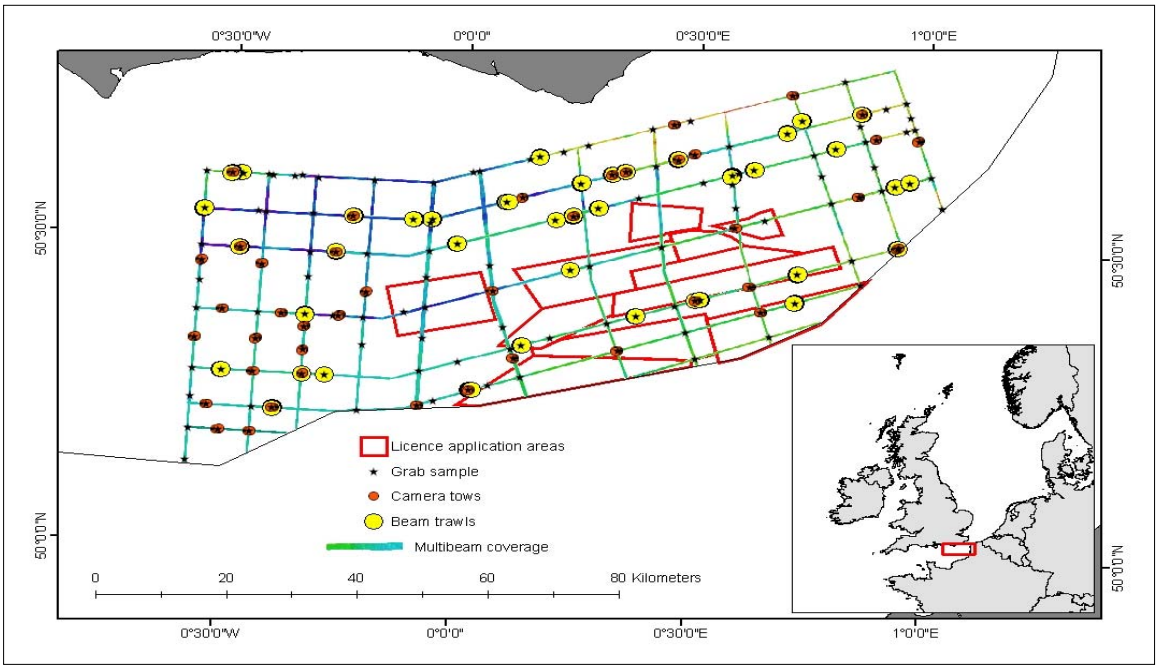

Figure 1. Study area in the Eastern English Channel, showing license application areas, the matrix of acoustic 'corridors' and positions of ground-truth sampling conducted in previous surveys (2005).

In February 2006, Cefas conducted an acoustic survey to collect additional sidescan and multibeam data from a set of 'infill' corridors, improving the original acoustic coverage (Figure 2). The purpose of the survey reported here was to ground-truth these new acoustic corridors using grabs, trawls and video methods (as in the previous ground-truthing survey). Sampling stations were selected to target nodes in the acoustic grid and/or features of interest observed in the acoustic data (Figure 2).

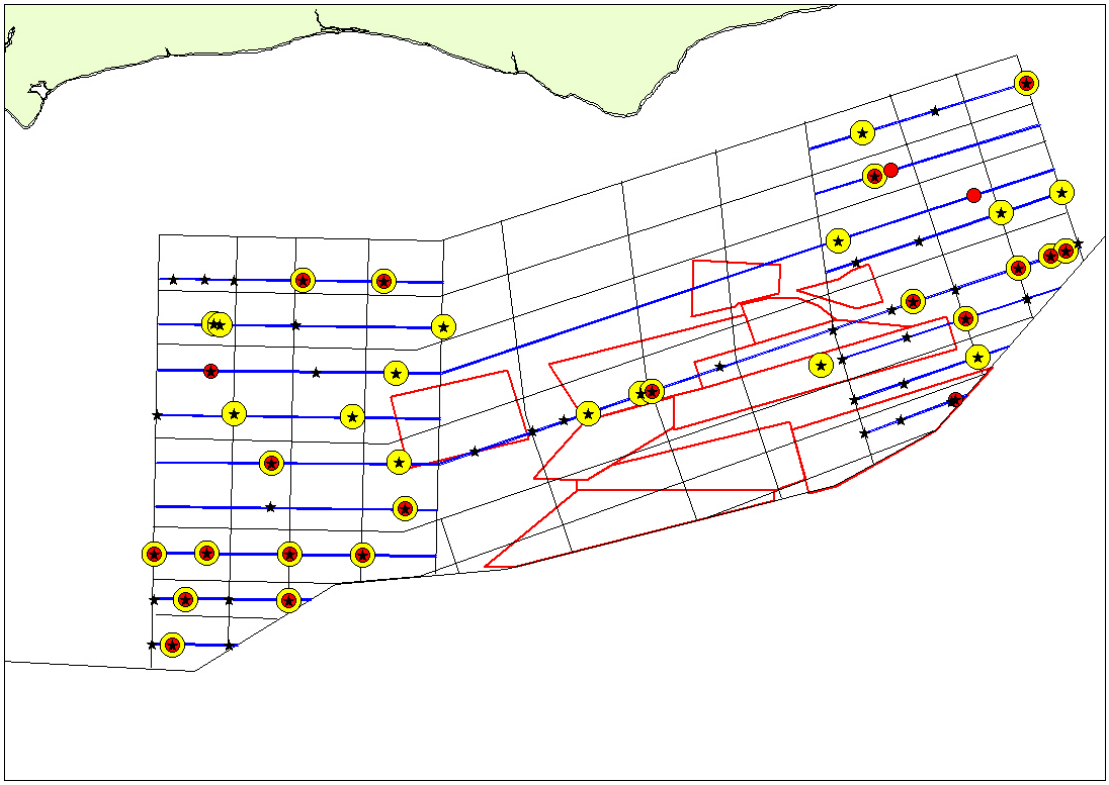

Figure 2. Locations of 'infill' acoustic corridors (blue lines) and planned ground-truth sampling sites for the 2006 survey. Symbols as in Figure 1.

Objectives

1. To collect ground-truth samples using Hamon grab, 2m Beam trawls and video observations (towed video sledge &/or drop camera) from the selected sampling sites.

2. To field-test an updated Cefas Standard Operating Procedure (SOP) for the collection and processing of Hamon grab samples.

3. To further develop the protocol for use of a camera sledge (tested in MESH Survey 07-05-02), through field trials of a more advanced system fitted with separate video and stills cameras and a laser-scaling device.

4. To develop through field trials a protocol for the use of a drop-frame camera system fitted with laser scaling device.

5. To use opportunities arising in work for other projects on the same Cruise, to develop protocols for the use of an observation class ROV.

Report

Ground-truth sampling

Grab samples were collected at 65 sites, using a 0.1m^2 Hamon grab. Initial processing was completed on board, with faunal and sediment samples being returned to the shore laboratory for analysis.

Epifaunal samples were collected at 32 stations using a 2-metre beam trawl. These were processed on board, and reference collections returned to the Cefas laboratory for confirmation of the faunal identification.

During the overnight periods, visual surveys of epifauna were conducted at 32 stations using a towed camera sledge. The analysis of the video and stills images will be overseen by the JNCC.

Hamon Grab SOP

Prior to the start of the survey, all personnel were briefed on the updated SOP for the Hamon grab operations. The procedure was then tested during field sampling and regular feed-back taken to highlight any amendments required. After the cruise, the SOP was modified to incorporate the feedback from the field testing.

Camera sledge SOP

The draft SOP for camera sledge work, presented to the MESH Technical meeting in Belfast (TG0511_Cefas08_Video_Survey_SOP_DRAFT_v5.pdf) related to the use of a camera sledge with a single combined video & stills camera fitted with a pan-and-tilt mechanism. For the current survey, a more advanced set-up was used, comprising two identical cameras with combined digital video and stills capability (Kongsberg Simrad OE14-208). One camera was fitted with a 4-spot laser scaling system (constructed by Cefas) and oriented to give a fixed, forward oblique view of the seabed, between the sledge runners. This camera was dedicated to capturing video images. The second camera was mounted behind the first, giving a fixed, vertical downward view of the seabed between the sledge runners. This camera was dedicated to collecting still images, and could be fired at will from the deck control unit. The system was used at all 32 video sampling sites on the survey.

The protocol for using the system was developed as a modification of the original draft SOP. Apart from the new configuration of the system, attention was paid to procedural elements that would form part of the Recommended Operational Guideline for underwater video and photographic imaging techniques (the Video 'ROG') that was being developed as part of the MESH Guidance document. These procedural elements addressed:

1. Preinstallation checks
2. Mobilisation protocols
3. Test and verification protocols
4. Operation guidelines
5. QC procedures
6. Data storage & backup recommendations
7. Recommended logging information
8. Demobilisation notes
9. Training
10. Safety precautions

Although fitted to the camera sledge, problems were encountered with the performance of the Ultra Short Base Line (USBL) tracking device, meaning that the position of the sledge had to be estimated by calculation of layback. The fault with the USBL system was fixed during a port-call on 27th July and the system used successfully during Part C of the cruise. Experienced gained will be valuable in preparing the Video ROG.

Protocols for the use of drop-camera frames

During Part B of the Cruise, the drop-camera system was configured and tested, using a single Kongsberg camera (as above) fitted with the laser-scaling device. A protocol for the use of the system was drafted during this test and subsequently developed during Part C of the Cruise when the drop-camera system was used extensively (29 deployments). The basic procedure was similar to that used for the camera sledge, so the protocol will be presented within the Video ROG as a procedural modification pertinent to the use of drop-cameras. The modifications address the configuration of the system, its deployment and recovery, the manner in which it is controlled to maintain optimal altitude above the seabed and the procedure for taking still images.

Protocols for the use of an ROV

Cefas had borrowed a Seaeye 'Tiger' observation class ROV for the duration of the Cruise, from another MESH partner (the Agri-Food and Biosciences Institute, Northern Ireland; formerly known as DARD-NI). The opportunity was taken to develop a protocol for the use of the ROV in habitat mapping by observing the field operations during parts B and C of the Cruise. The protocol will again be detailed as a procedural modification within the Video ROG, addressing mobilisation, deployment and recovery, and the conduct of the dive.

Personnel

The following personnel were involved in parts B & C of the Cruise. All were Cefas staff, unless otherwise indicated. Mr D. Limpenny was the Scientist-in-Charge (SIC).

Part B :	**Part C:**
D Limpenny (SIC)	D Limpenny (SIC)
P Whomersley	P Whomersley
W Meadows	W Meadows
N Lyman	A Brown
K Vanstaen	K Vanstaen
S Ware	S Ware
M Curtis	R Coggan
B Pearce (MES Ltd)	S Birchenough
E Virling (JNCC)	C Mason
R Coggan	V Blythe-Skyrme (JNCC)
S Birchenough	E Hamilton-Taylor
E Hamilton-Taylor	