

**CENTRE FOR ENVIRONMENT, FISHERIES AND AQUACULTURE
SCIENCE, LOWESTOFT LABORATORY, LOWESTOFT, SUFFOLK NR33
OHT**

2007 RESEARCH VESSEL PROGRAMME

REPORT: RV CEFAS ENDEAVOUR: SURVEYS 6-7

STAFF:

J Ellis (SIC, 6/07)
T Maxwell (SIC, 7/07)
M Schratzberger (2IC)
S Bolam
M Eade
F Goodsir
N Lyman
S Ware

DURATION: 01–05 April 2007 and 06-12 April 2007

LOCATION: Western English Channel and Celtic Sea

AIMS:

Survey 6/07: To carry out a benthic and trawl survey of shell gravel biotopes and other coarse grounds in the western English Channel, in support of project AE1148, to:

- a. Examine the distribution, size composition, abundance and diversity of fish, epibenthos, infauna and meiofauna on specific biotopes;
- b. Evaluate catch variability and the degree of replicate sampling required to determine indices that may be applied to benthic communities;
- c. Collect sedimentary and biological samples for further studies supporting the development of ecological objectives for benthic communities

Survey 7/07: This is the first in a series of cruises over the next four years in the South-western approaches, in support of MF101. The results of this work will aim to describe the effects of fishing and the environment on production and food web structures. The specific objectives of the cruise were:

- a. To sample infaunal and epifaunal invertebrates and fish at a series of sites subject to different levels of trawling disturbance for production studies.

NARRATIVE:

CEFAS ENDEAVOUR sailed from Portland at 10:35 GMT on 01 April and steamed westwards in poor conditions to the study area for survey 6/07, a

shell gravel habitat in the western English Channel, arriving on site shortly after 18:00 hours. Sampling commenced that evening with three successful deployments of the Agassiz trawl at the main central station (prime station X-11, Figure 1). Sampling started at 06:00 the following day, with three replicate tows made with 4m-beam trawl, with further samples collected with Agassiz trawl (two hauls), 2m-beam trawl (five hauls) and Shippek grab (five samples) at the main site. That evening single 2m-beam trawl samples and Shippek grab samples were collected at two grid stations, with the remaining six grid stations (Figure 1) sampled successfully on 03 April. As sea conditions were unsuitable for deployments with the drop camera, CEFAS ENDEAVOUR steamed north-west that afternoon to commence work for survey 7/07, and a 4m-beam trawl sample was collected at one of the South Eddystone stations (E4), before steaming overnight to the North Haig Fras site.

Work at the first site in this area (H4) started at 07.30 on 04 April and continued until 20.30, by which time a further two stations (H3 and H2) had been completed successfully. At each of the three stations the large Hammon Grab, the 2-metre beam trawl and the 4-metre beam trawl were deployed. Data on the benthic invertebrate and fish communities were obtained, as well as samples collected for the analysis of sediment granulometry. A further five NIOZ core samples were collected at H2 and the cores sieved to obtain benthic infauna. The first three cores were also sub-sampled for chlorophyll a and porosity and meiofaunal samples were taken from the first 4 cores. On completion of the days main aims, the drop camera was deployed in order to test the equipment, in preparation for use later on in the cruise. CEFAS ENDEAVOUR then steamed overnight to station H1.

Work on the final North Haig Fras station (H1) commenced at 05.54 on 05 April with the Hammon grab. During this time two 2-metre beam and one 4-metre beam trawls were also deployed for the collection of epifauna and fish. A further five NIOZ replicates were also obtained. At 09.20h, with all work completed at the North Haig Fras site, CEFAS ENDEAVOUR steamed northeast to the second benthic ecology site at North Seven Stones. Work commenced again at 12.30 and continued until 19.30, during which time, sites N3 and N2 were sampled, with 10 Hammon grabs, four 2-metre beam trawls and two 4-metre beam trawls being deployed successfully.

CEFAS ENDEAVOUR steamed towards the third North Seven stones site (N1) overnight. Sampling commenced at 05.15 on 06 April, and all sampling was completed by 08.50. CEFAS ENDEAVOUR then steamed to the final North Seven Stones site (N4), with all Hammon grab and beam trawl samples collected by 13.20. That afternoon CEFAS ENDEAVOUR steamed south to the third benthic ecology site (South Scilly) arriving at station S1 at 17.40, and all grab and beam trawl samples were successfully collected that evening, and CEFAS ENDEAVOUR steamed to station S4 that night.

The remaining three South Scilly sites (S4, S3 and S2) were sampled successfully between 05.30 and 19.40 on 07 April, with extra Nioz core samples also collected for the analyses of benthic infauna and meiofauna,

and chlorophyll a at stations S4 and S3. That night, CEFAS ENDEAVOUR steamed eastwards to the South Eddystone study site.

Work commenced at E1 at 05.30 on 08 April, with stations E2 and E3 also sampled successfully with the Nioz corer, 2-metre beam, 4-metre beam and the Hammon grab by 18:00. Work at the final station (E4) commenced at 05.30 on 09 April with the Hammon grab, though no successful grab samples were obtained and 2-m beam trawl samples were collected. Sampling with the Hammon grab resumed at 07.20, but even after moving the sampling location and deploying the Shippek grab to check the sediment type, no successful samples were obtained after a further hour and a half, sampling at this site was abandoned.

CEFAS ENDEAVOUR then steamed to the most north-westerly grid station of the shell-gravel habitat, arriving at about 10:00, in order to recommence work for survey 6/07. The drop camera was deployed for 15-20 minutes at each of the nine stations, with work completed by 20:15. That night CEFAS ENDEAVOUR steamed south-east, with exploratory sampling on the Banc de Langoustiers undertaken the following day. After checking the ground, tows either side of the Bank were located and sampled with 2m and 4m beam trawl and shippek grab, with the drop camera deployed over parts of the bank itself. After undertaking a multibeam survey of the area in the later afternoon and evening, CEFAS ENDEAVOUR steamed north-west and returned to the South Eddystone area to complete sampling for survey 7/07.

A new sampling site (E5) was chosen, with work commencing at 05:00 on 11 April. Five successful Hammon grab deployments were collected by 06:20, and a further two 2-metre beam trawls and one 4-metre beam trawls were also collected. With all the primary aims of the cruise achieved, CEFAS ENDEAVOUR then set sail for Lowestoft, docking at xx:xx on 12 April.

RESULTS:

Survey 6/07: Benthic and trawl survey of shell-gravel biotopes

A shell-gravel biotope in the western English Channel was surveyed with replicate sampling of a variety of gears to sample epifauna and demersal fishes, with samples also collected for sedimentary analyses. Summary details of gear deployments are given in Table 1. These sites were all relatively diverse, with queen scallop *Aequipecten opercularis*, scallop *Pecten maximus*, the hermit crab *Pagurus prideaux* and various spider crabs (e.g. *Inachus* and *Macropodia*) all abundant. Unusual species recorded included the aphroditid worm *Hermione hystrix* and the natantid shrimp *Alpheus macrocheles*. The drop camera was deployed at all stations and confirmed the shelly nature of the seabed, although other seabed features (e.g. sand ripples) were also observed.

Sampling was also undertaken on the coarse grounds of the 'Banc des Langoustiers'. Trawl catches on the western and eastern boundaries of the bank were dominated by large echinoderms (e.g. *Martasterias glacialis*, *Luidia*

ciliaris and *Echinus esculentus*), with sessile fauna (e.g. sponges, hydroids, *Alcyonium* and *Pentapora*) and several crustaceans all relatively abundant. The drop camera was deployed on the bank itself, which comprised areas of bedrock, large boulders, as well as patches of shell-gravel with cobbles. Various large echinoderms, as well as colonies of sponges, *Alcyonium* and *Pentapora* were observed.

Survey 7/07: Benthic and trawl survey of a series of sites subject to different levels of trawling disturbance for production studies

At four locations (South Eddystone, South Scilly, North Seven Stones and North Haig Fras) subject to differing levels of fishing impact, samples were successfully collected for the analyses of benthic infauna, epifauna and fish. Although no benthic infauna were collected at one station (E4), additional sampling was undertaken at a fifth station in a comparable area. Additional Nioz core samples were also collected for analyses of meiofauna, sediment particle size analysis and chlorophyll a.

We thank the officers and crew for their hard work during the course of the survey

J Ellis/T Maxwell
12 April 2006

SEEN IN DRAFT

R McCurry (Master)
B Salter (Senior Fishing Mate)

INITIALLED:

SI Rogers
S Jennings

DISTRIBUTION:

Basic list
Staff on Survey
Stuart Rogers
Simon Jennings
Bill Camplin
Ted Potter
Roger Coggan
Cornwall SFC
Isles of Scilly SFC
France (via FCO)

Table 1: Summary of gear deployments (Survey 6/07)

Gear	Shell gravel habitat		Banc des Langoustiers	
	Valid	Invalid	Valid	Invalid
Shippek Grab	13	-	2	-
Drop Camera	9	-	4	-
Agassiz Trawl	5	1	-	-
2m Beam Trawl	13	-	2	-
4m Beam Trawl	3	-	2	-
TOTAL	43	1	10	0

Figure 1: Map of sampling locations for surveys 6/07 (X-11 and Banc des Langoustiers) and 7/07 (filled triangles), and detailed locations of main and grid sampling locations for study site X-11 (survey 6/07, below)

