

**CENTRE FOR ENVIRONMENT, FISHERIES AND AQUACULTURE
SCIENCE
LOWESTOFT LABORATORY, LOWESTOFT, SUFFOLK NR33 OHT
2006 RESEARCH VESSEL PROGRAMME**

REPORT: RV CEFAS ENDEAVOUR: SURVEY 10A/06

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DURATION: 20–25 April 2006

LOCATION: Southern North Sea

AIMS:

(1) To carry out a benthic and trawl survey of gravel biotopes and sand bank habitats in the southern North Sea, 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 accurately 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

(2) To collect biological samples of macro-crustaceans for the analysis of heavy metals (L. Newton, University of West of England)

NARRATIVE:

CEFAS ENDEAVOUR sailed from Lowestoft at 15:00 on 20 April and, in calm seas, steamed southwards to the first study area, a gravel habitat east of Felixstowe (close to Area 222), arriving on site shortly after 18:00 hours. Sampling commenced that evening with Agassiz trawl (five replicate hauls) and camera sledge in the first sampling box. Sampling started at 05:30 the following day, and sampling with 2m-beam trawl (five replicate hauls) and Hamon grab were completed at the first reference box. Subsequently, 4m-beam trawl sampling (five replicate hauls) was completed between the two reference sites, and Agassiz trawling (five replicate hauls) completed at the second reference box. Sampling in the second reference box was completed

on 22 April, with samples collected with 2m-beam trawl (five replicate hauls) and Hamon grab. Following this, further 2m-beam trawl samples were collected at intermediate positions. That afternoon, CEFAS ENDEAVOUR steamed northwards towards the Broken and Swarte Banks, to undertake sampling of sandbank habitats.

Sampling commenced at 05:30 on 23 April, with replicate samples collected at the central station on the Broken Bank with 2m-beam trawl, day grab and NIOZ corer. Further samples were taken with day grab and 2m-beam trawl on the top of the bank and either side of the bank, with the camera sledge deployed at slack water that evening. Grab and trawl sampling continued that night, with sampling at this site completed at 00:30 that night. Sampling on the Swarte Bank commenced the following day at 05:30, with all stations on the top of the sand bank and north-eastern side of the bank sampled successfully. The camera sledge was also deployed that evening, at slack water. The remaining stations on the south-western side of the bank were sampled with grab and 2m-beam trawl the following morning, though the 2m-beam trawl net was badly damaged at one site, and was subsequently repeated. Two hauls were made with 4m-beam trawl between the two banks during the late morning, and CEFAS ENDEAVOUR then steamed to Lowestoft, arriving outside the harbour at 18:30, where an exchange of staff was made by sea rider. CEFAS ENDEAVOUR then steamed northwards for survey 10B/06.

RESULTS:

(1) Benthic and trawl survey of gravel biotopes and sand bank habitats

Two habitat types were surveyed with replicate sampling of a variety of gears to sample meiofauna, infauna, epifauna and demersal fishes, with samples also collected for sedimentary analyses. The number of samples collected with each gear are summarised in Table 1.

(a) Gravel biotopes

An area of coarse ground east of Felixstowe (Figure 1) was sampled with grab and various trawls, with sampling concentrated in two boxes. Multibeam data were collected over the area.

Hamon Grab: Five successful samples were collected at each of the two reference boxes.

Agassiz trawl: Five valid hauls were made with the Agassiz trawl at each of the two reference boxes. Catches at both sites were dominated by green sea urchin *Psammechinus miliaris*.

2m-Beam trawl: Five valid hauls were made with the 2m-beam trawl at each of the two reference boxes, and a further seven valid samples collected from the surrounding area. Catches at both sites were dominated by *P. miliaris*, with various crustaceans (e.g. *Pandalus montagui*) also abundant.

4m-Beam trawl: Five valid hauls were made on the gravel habitat, with tows crossing both reference boxes. Catches were dominated by larger epifauna, including *P. miliaris* and common urchin *Echinus esculentus*. The more abundant fish at this site included lesser-spotted dogfish *Scyliorhinus canicula* (mostly immature specimens), bib *Trisopterus luscus*, cod *Gadus morhua* and sole *Solea solea*. Several large egg-masses of common whelk *Buccinum undatum* were also recorded in these catches.

Camera sledge: Due to the low visibility, direct observations on these grounds were limited.

(b) Sand bank habitats

Two sand banks in the southern North Sea (Figure 1) were sampled with grab, corer and various trawls. Sampling was conducted on both the crest of the sand banks and deeper surrounding environment. Multibeam data were collected over the area.

NIOZ corer: Five replicate samples were collected from the main stations on both the Swarte and Broken Banks.

Day Grab: Five replicate samples were collected at five sites along each sand bank and at single sites either side of these sand banks. Single samples (for meiofauna and PSA) were collected at eight other sites sampled with 2m-beam trawl.

2m-Beam trawl: Five valid hauls were made with the 2m-beam trawl at each main station on the Swarte and Broken Banks. A further four sites on each sand bank, and three sites either side of each sand bank were also sampled successfully. Catches on both sand banks were dominated by lesser weever *Echiichthys vipera* and solenette *Buglossideum luteum*, and catches were generally small. Catches off the sand banks were generally larger with brittlestars (*Ophiura* spp.) more abundant. Sites off the sand banks generally yielded small amounts of *Sabellaria*.

4m-Beam trawl: Two stations were fished successfully at sites between the Swarte and Broken Banks. Catches were comprised primarily of flatfish (dab, plaice, sole, scaldfish and solenette).

Camera sledge: Two stations off the sand banks were sampled with camera sledge at slack water, with reasonable visibility.

(c) Biological observations

Mantis shrimps *Rissoides (Meiosquilla) desmaresti* were observed frequently on the gravel habitats. Several specimens of sea snail *Liparis liparis* were also observed here. Catches on the sand banks were dominated by lesser weever, with many juveniles observed in 2m-beam trawl samples.

(2) Collection of biological samples

Samples of various crustacean species (brachyuran crabs, mantis shrimp and *Crangon* spp.) were collected from both habitats types and frozen.

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

J Ellis
05 May 2006

SEEN IN DRAFT

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

INITIALLED:

SI Rogers

DISTRIBUTION:

Basic list
Staff on Survey
Stuart Rogers
Bill Camplin
Roger Coggan
Keith Cooper
Sian Boyd
Eastern Sea Fisheries Committee

Table 1: Summary of gear deployments

Gear	Gravel habitat		Sand bank habitat	
	Valid	Invalid	Valid	Invalid
NIOZ Corer	-	-	10	-
Day Grab	-	-	78	-
Hamon Grab	10	-	-	-
Camera sledge	2	-	2	-
Agassiz Trawl	10	-	-	-
2m Beam Trawl	17	2	30	3
4m Beam Trawl	5	-	2	-

Figure 1: Location of study sites on gravel biotopes and sand bank habitats in the southern North Sea. Sampling locations on and around the Broken Bank and Swarte Bank show main stations ● (5 x 2m-beam trawl hauls, 5 x day grab samples, 5 x NIOZ samples), grid stations ◆ (1 x 2m beam trawl haul and 5 x day grab samples) and additional stations △ (1 x 2m-beam trawl haul and 1 x day grab sample).

