

P17/6

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FRV *Clupea*

Cruise 1502C

REPORT

23 September to 4 October 2002

Personnel

S P R Greenstreet	(SIC 25 September to 4 October)
M Robertson	(SIC 23-25 September)
H M Fraser	
C Hall	(23-25 September)
J Dunn	(23-25 September, 3-4 October)
S Fraser	(3-4 October)

Cruise Objectives

To recover long-term hydrographic monitoring moorings off Stonehaven, on the Wee Bankie, and off the Marr Bank.

To conduct a hydrographic and plankton survey along a transect off Stonehaven.

To determine spatial variation in the water temperature, salinity, fluorometric, and turbidity profiles within the main Wee Bankie/Marr Bank study area by CTD-fluorometer-transmissometer dips.

To carry out a night-time grab survey to assess sandeel abundance and distribution in sediments previously determined as suitable sandeel habitat. The sediment samples collected during this survey will be used to assess the RoxAnn derived sandeel habitat map.

To obtain samples of sandeels for population age structure analysis at pre-determined stations on the Wee Bankie, Marr Bank and Berwick's Bank using a sandeel dredge.

Out-turn days per project: 4 days MF0463; 8 days C683

Narrative

The scientific equipment was loaded on board *Clupea* at Fraserburgh on 18 September. Scientists joined *Clupea* at Fraserburgh at 0900 hours on 23 September and the vessel sailed at 0930 hours. *Clupea* arrived at the Stonehaven mooring at 1430 hours and the mooring was recovered with all instruments intact. *Clupea* then sailed for Aberdeen, arriving at 1800 hours, whereupon the recovered mooring was unloaded. The next day the vessel sailed at 0300 hours to recover the Marr Bank and Wee Bankie moorings. *Clupea* arrived at the Marr Bank station at 0900 hours and recovered the instrument mooring by 1000 hours. Two mini-loggers were missing from this mooring. The vessel then sailed for the Wee Bankie station, arriving at

1130 hours, and completed recovery of the instrument mooring by 1230 hours. All instruments at this station were recovered intact. *Clupea* then sailed for Montrose, arriving at 1730 hours. Figure 1 shows the locations from where the moorings were recovered. CTD/Fluorometer/Transmissometer casts were made at each mooring station immediately following recovery of the moorings.

The following day John Dunn and Chris Hall left the vessel and Simon Greenstreet joined it. The instrument mooring equipment was also unloaded. *Clupea* then remained in Montrose for the rest of the day, sailing at 1800 hours on 25 September, to commence nocturnal grab sampling, dredge sampling and hydrographic CTD survey work in the main study area. Over the following seven nights 211 grab stations and eight dredge stations were sampled, and 44 hydrographic dips were made.

The grab survey work involved sampling at 211 stations established over eleven earlier cruises carried out since 1998 (Fig. 2). At 29 of the grab stations no sediment sample was obtained. At a further nine stations, sufficient material was obtained to allow a sediment sample to be taken (using a 32 mm internal diameter corer), but the penetration depth of the grab was such that the capture of any sandeels, had any been present in the sediment, was deemed unlikely. In total, 173 valid sandeel assessment grab samples were obtained, of which 56 contained sandeels, providing a total catch of 266 sandeels. All sandeels caught were measured (to the half centimetre below) and weighed (to the nearest 0.1 g). Otoliths were removed from all fish to enable age determination back in the laboratory.

The modified sandeel dredge was deployed at each of the eight stations sampled previously in the preceding March and June 2002 cruises (Fig. 3). The purpose of these dredge samples was to collect sufficient sandeels for more accurate estimation of population age and length composition on the various sandbanks. At each location the dredge was towed twice along the seabed for 10 minutes, towing down the line in both directions. A Scanmar depth unit was attached to the dredge so that the precise time and position of touch-down on to, and lift-off from, the seabed could be determined. The total number of sandeels in each of the 16 catches was counted and a sub-sample from each was measured to the half-centimetre below. Ten sandeels from each half-centimetre size class were weighed to determine length-weight relationships. Otoliths were removed from these fish to establish age-length keys. In total 1,865 sandeels were measured, weighed and otolith sampled.

As far as possible the CTD, fluorometer and transmissometer were deployed at convenient grab stations so as to obtain as even a coverage across the study area. In parts of the study area where no grab stations were located, the vessel had to go "out of its way" specifically to deploy the instruments and collect data in these gaps. CTD/fluorometry/transmissometry data were collected at 44 locations across the study area (Fig. 4).

During the course of the nocturnal grab, dredge and CTD survey work, *Clupea* spent the daylight hours at anchor off St Andrews (26, 29, 30 September, 1 and 2 October) and St Abbs (27 and 28 September). This part of the cruise's programme was completed by 2330 hours on 2 October, whereupon *Clupea* sailed for Montrose. Having missed the tide, *Clupea* anchored off Montrose until 0530 hours on 3 October, then sailed into port on the next tide. John Dunn and Sheila Fraser joined the vessel at 1800 hours on 3 October, at which point, the vessel sailed for the Stonehaven hydrographic transect. *Clupea* arrived at the transect at 2045 hours. Figure 5 shows the location of the stations sampled. At each station the CTD, with its associated Fluorometer and Transmissometer, was deployed to obtain full water column profiles. A vertical dip was made with a dual bongo net fitted with 200 μm and 95 μm filters for

phytoplankton and small zooplankton. Water samples were collected from approximately 10 m above the seabed and 10 m and 2 m below the water surface for chlorophyll and salinity analysis. A surface 10 m water column sample was collected by hose for phytoplankton analysis. A 1 m net was deployed, using a single oblique tow, to sample larger zooplankton. This work was completed by 0100 hours on 4 October and *Clupea* then sailed for Fraserburgh, arriving at 0600 hours.

The scientific equipment was off-loaded and scientists left the vessel by 1045 hours on 4 October.

Simon Greenstreet
23 October 2002

Seen in draft: A Simpson, OIC *Clupea*

Figure 1. Locations where long-term instrument mooring lines were recovered.

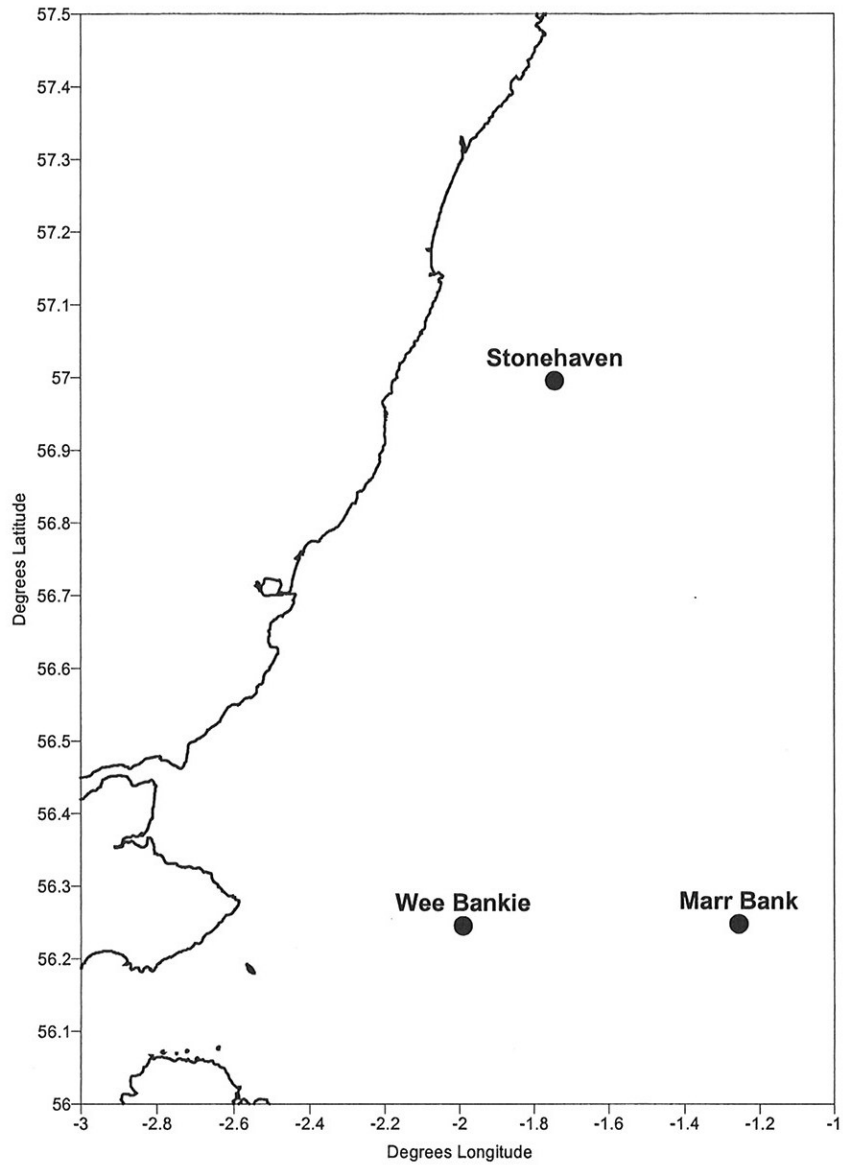


Figure 2. Grab stations sampled.

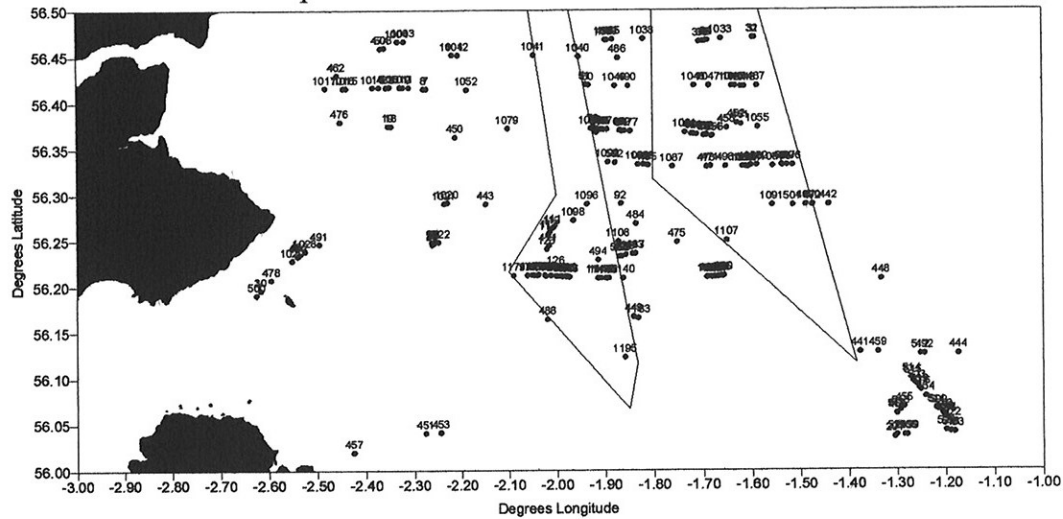


Figure 3. Dredge stations sampled. Each station was sampled twice.

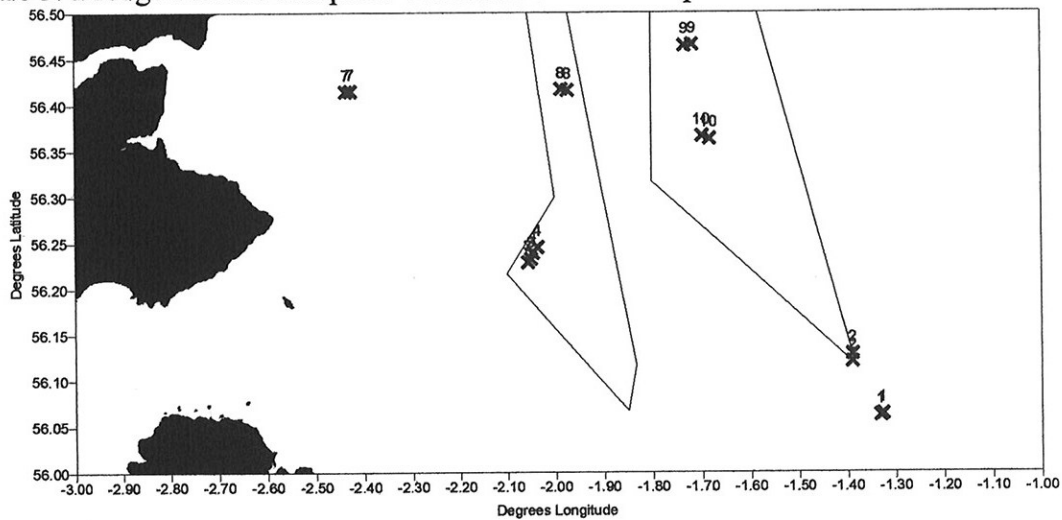


Figure 4. Location of CTD/Fluorometer/Transmissometer hydrography casts.

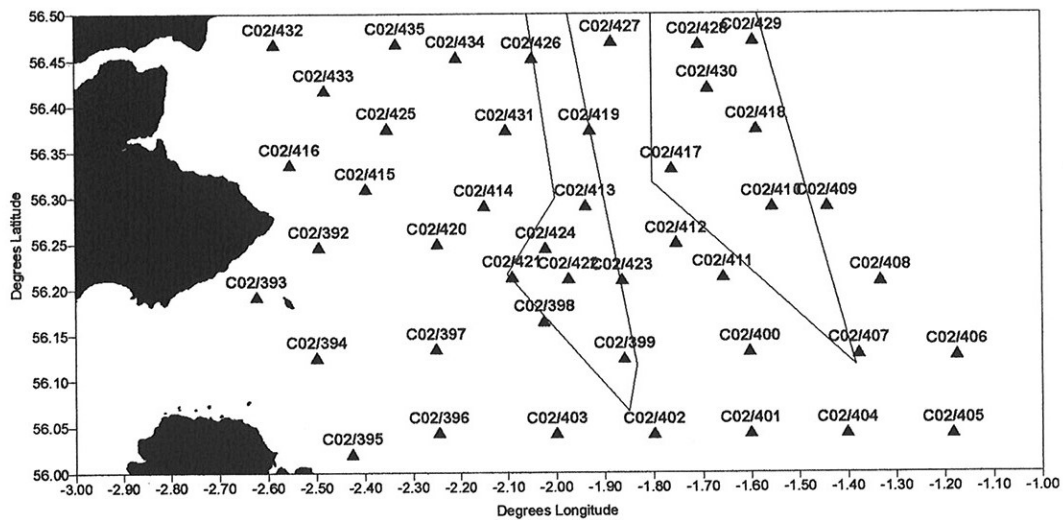


Figure 5. Stonehaven hydrography and plankton transect stations sampled.

