

R1/3

Not to be cited without prior reference to the FRS Marine Laboratory, Aberdeen

FRV *Clupea*

Cruise 0504C

REPORT

20-29 March 2004

Personnel

H M Fraser (SIC)

I Penny

N Jacob

Cruise Objectives

1. To investigate variation in sandeel population age structure at different locations on the Wee Bankie and Marr Bank from samples collected using the Sandeel dredge.
2. To determine spatial variation in seawater temperature/salinity and chlorophyll across the study area using a Seabird CTD sampler.
3. To investigate potential new sites for sandeel dredging, using the sandeel dredge and Day grab in the Firth of Forth.

Out-turn Days Per Project: 5 days MF0463, 5 days MF07n

Narrative

The scientific equipment was loaded on board *Clupea* at Fraserburgh on 18 March. Scientists joined *Clupea* at Fraserburgh at 2200 on 20 March and the vessel sailed at 2400. *Clupea* sailed to Lunan Bay and remained at anchor on Sunday, to switch over to a night-working regime, sailing at 1700 on 21 March to commence nocturnal grab sampling, dredge sampling and hydrographic CTD work in the main study area. Over the following seven nights 580 grab stations and eleven dredge stations were sampled, and 11 hydrographic dips were made:

The modified sandeel dredge was deployed at each of the eight stations sampled previously in 2003. 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 sandeel dredge was deployed at another three previously un-sampled sites. The total number of sandeels in each of these 22 catches was determined and a sub-sample from each was measured to the half centimetre below. Five 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 1650 sandeels were measured, weight and otolith sampled.

The grab work involved intensive sampling in the vicinity of each of the dredge stations. The eight main dredge sites had been sampled on many previous occasions. A box, which included the area covered by all previous dredge tows, was drawn around each dredge station. The *Clupea* then drifted across each of the boxes several times with the grab being deployed constantly in order to assess changes in habitat and density of sandeels across the box. On average 50 grabs were deployed at each site. In areas where no dredging had previously taken place, boxes were drawn around grab stations which had been sampled during previous trips and where reasonable catches of sandeels had been obtained. A total of 580 grabs were deployed. At 142 stations no sediment sampled was obtained. In total 438 valid sandeel assessment grab samples were obtained, of which 249 contained sandeels, providing a total catch of 1525 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 for age determination back in the laboratory.

The CTD was deployed at each dredge station. CTD data was collected at all eleven stations.

During the course of the nocturnal grab and dredge survey, *Clupea* spent daylight hours at anchor off St Abbs (22 and 23 March), Isle of May (24 March), Pitenweem (25 March), St Andrews (26 and 27 March). The cruise programme was completed by 2300 on Saturday 27 March, whereupon the *Clupea* sailed for Fraserburgh, arriving at 0900 on Sunday 28 March.

The scientific equipment was off-loaded and scientists left the vessel by 1100 on Monday 29 March.

H M Fraser
31 March 2004

Seen in draft: A Simpson, OIC *Clupea*