R1/12

IN CONFIDENCE - NOT TO BE QUOTED WITHOUT REFERENCE TO THE LABORATORY

FRV SCOTIA 4SR82

CRUISE 6/82

REPORT:
9-29 June 1982

OBJECTIVES

1. To carry out an acoustic and midwater trawling survey of the North Sea mackerel stock.

2. To carry out a plankton survey for mackerel eggs.

NARRATIVE

"Scotia" sailed from Aberdeen at 1900 on 9 June after a brief delay caused by a fault in the plankton winch. During preliminary tests on the acoustic equipment, carried out en route towards the first calibration position, a fault developed in the echosounder and "Scotia" returned to Aberdeen for repairs. These were successfully completed the following day and "Scotia" sailed again at 1800 towards the Firth of Forth to carry out a first calibration of the acoustic equipment. This was completed by 0630 on 11 June. The acoustic and fishing survey commenced on arrival in the survey area in the early hours of the following morning. The work continued uninteruptedly until its completion at 0630 on 16 June. During this period ten positions were fished by handline and four by pelagic trawl. A second acoustic calibration was carried out in Aberdeen bay on the evening of 16 June prior to docking in Aberdeen for the half landing.

"Scotia" sailed from Aberdeen again at 1200 on 18 June and began a plankton survey at 0300 the following morning. 59 plankton stations were worked during this grid including 5 stations outwith the planned area. These were undertaken in consultation with the Norwegian research vessel "Johan Hjort", also carrying out a mackerel egg survey at the same time, in order to establish the eastern extremity of the mackerel egg distribution at latitude 56°N. Daily radio contact with the "Johan Hjort" was maintained throughout the cruise. The egg survey was completed at 0100 on 24 June. During the survey the echosounder was run and annotated continuously. On the basis of information from this source and a preliminary investigation of mackerel egg abundance at each station a small area was selected in which to carry out an intensive acoustic survey followed by an intensive plankton survey. The acoustic survey was completed between 1600 on 24 June and 0800 on the 26th and included 5 trawl hauls and 2 handline hauls. The plankton survey commenced immediately afterwards and was completed at 1300 on the 27th. "Scotia" then sailed for the Firth of Forth to carry out a final acoustic calibration. This was finished by 1130 on 28 June. "Scotia" docked in Aberdeen at 1900 the same night.

RESULTS

Acoustic survey

Cruise tracks and the positions of fishing and plankton stations for the two halves of the cruise are given in the Figures attached. The smaller area in

which more intensive work was carried out in the second half of the cruise is indicated in Figure 2.

The trawl used was a "Scotia" pelagic sampling trawl (PT 160) fitted with a 3m blinder with a mesh of 20mm. Plankton sampling was carried out using a high speed Loch Ewe net fitted with a 500 μ mesh size, a flowmeter and a depth monitor. Hauls were of stepped horizontal type towing for 5 minutes at 20, 15, 10, 5 metres and just below the surface.

Acoustic survey

During the acoustic/fishing survey in the first half of the cruise pelagic fish type echotraces were found to be fairly scarce. South of 56°30'N hardly any were observed while to the north they were rather more abundant. This pattern was confirmed by monitoring the echosounder during the main plankton survey in the second half of the cruise. In the area selected for the second acoustic/fishing survey on the basis of high concentration during the first half and an above average concentration of mackerel eggs, pelagic fish type echo-traces were much more abundant. Identification of echo-traces by fishing was largely unsuccessful except in one instance where a dense patch of echo traces was identified as 0-group gadoids. Analysis of acoustic density measurements from observed echo-traces has not yet been carried out but may help to indicate which traces, if any, were mackerel.

Small catches of mackerel were obtained by towing the pelagic trawl through the plankton layer at dawn and dusk but no discernible pelagic fish type echo-traces were evident during these hauls. No mackerel were caught with handlines. The size range of the trawled mackerel was 28-44cm with a mode of 43cm. The majority of these fish were in spawning condition and the most abundant year-class was that of 1969 (13 year olds). A small number of ovaries were obtained for fecundity studies, and stomachs were collected for ICES feeding investigations.

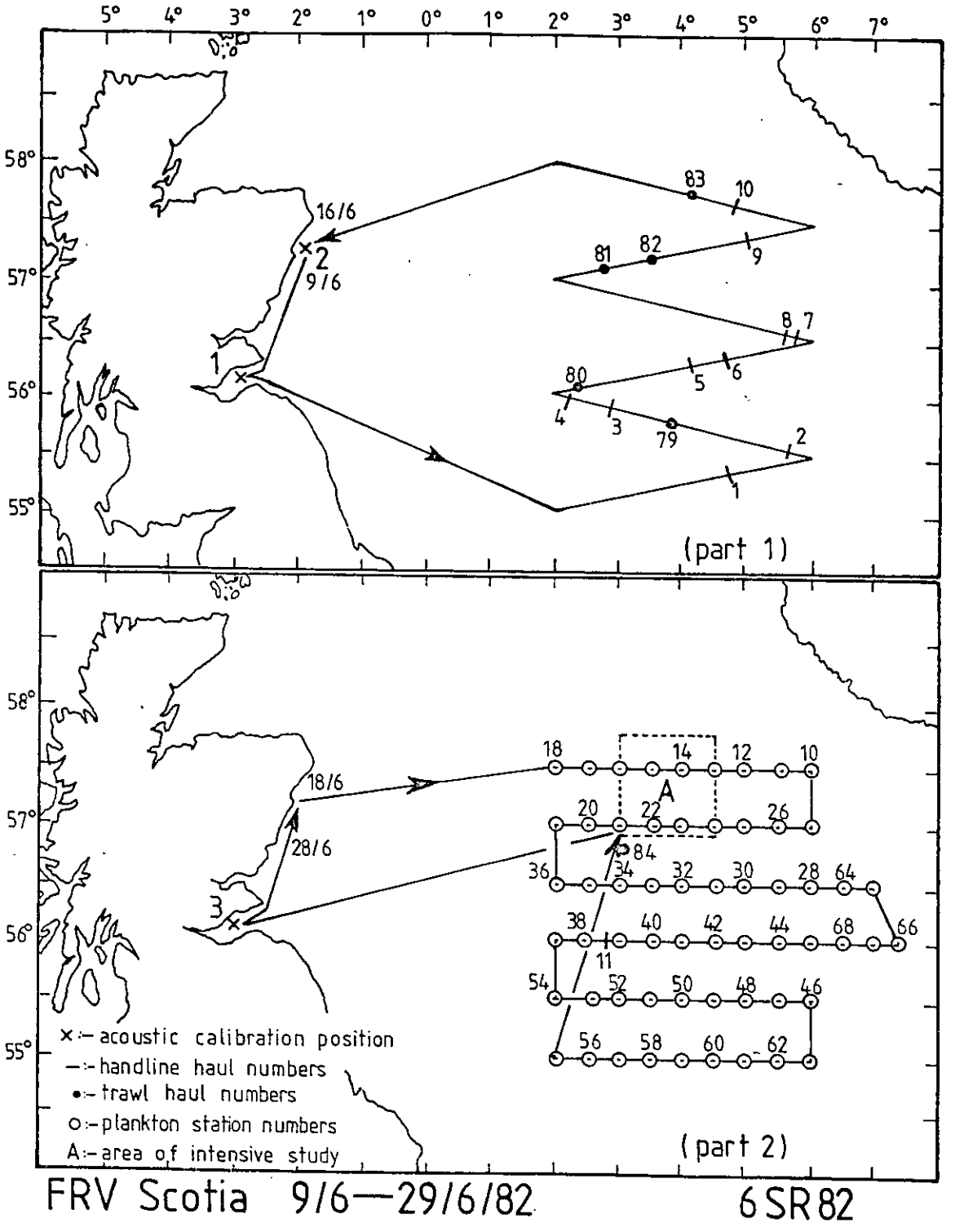
Egg survey

During the two plankton surveys mackerel eggs were obtained at most stations. A preliminary analysis of the results indicates a rather patchy distribution. Three patches of higher concentration were observed, the most southerly was between latitudes 55°30 and 56°N on longitude 5°30'E, the remaining two were on latitude 57°30'N, one at 3°30'E, the other at 6°E at the north eastern extremity of the survey grid.

During plankton hauls on both plankton surveys signal inputs from the depth monitor were recorded on tape with the objective of developing a better system for monitoring sampler distance from the bottom as required for forthcoming herring larval surveys.

M. WALSH
14 July 1982

Seen in draft: I L McLeod



Note: Additional hauls were made within area A as follows:

Plankton	16
Trawl	4
Handline	2