R1/12

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FRV *Scotia*

Cruise 0905S

REPORT

28 June - 18 July 2005

Personnel

Paul Fernandes	(In Charge)
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Michael Stewart	
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Objectives

1. To conduct an acoustic survey to estimate the abundance and distribution of herring in the north western North Sea and north of Scotland between 58º15-61.45'N and 4ºW to 2ºE, excluding Faroese waters.
2. To obtain echosounder trace identification using a pelagic trawl.
3. To obtain samples of herring for biological analysis, including age, length, weight, sex, maturity, ichthyophonus infection and fat content.
4. To obtain hydrographic data for comparison with the horizontal and vertical distribution of herring.
5. To obtain plankton samples for acoustic identification work.
6. To test the new multisampling pelagic cod-end.

Out-turn days per project: RV0504 – 21 days

Narrative

All gear was loaded in Aberdeen on 27 June. Scientific staff joined the vessel at 0900 hours on 28 June and it departed at 1000 hours on the same day. A meeting was held with all scientists to explain the objectives of the survey and to describe general operating procedures. The vessel then proceeded to the outskirts of Aberdeen Bay where the pelagic trawl was deployed to familiarise the crew with its deployment prior to it being used in earnest. The survey commenced just outside Aberdeen at 1630 hours on 28 June. Transects progressed northwards along lines of latitude, at spacings of 15 or 7.5 nautical miles (n.mi.). Transect spacing was based on the results of previous surveys and transects were placed relative to ICES rectangles. Transects extended as far east as 1°45E, and as far as safely possible to the west, on approaching the coast. Calibration of all four transducers took place in Scapa Flow on Thursday 30 June and the survey resumed afterwards on 1 July. A half landing took place on 8 July in Lerwick in accordance with rest

provision for the working time directive and for the exchange of personnel (T Marshall for S Clarke). The vessel resumed surveying at 1230 hours on 9 July. West of the Shetland Isles, transects extended from the coast to the shelf edge or longitude 4° west. The survey was completed on 17 July at 0800 hours. All four transducers were calibrated successfully once again in Scapa Flow on 17 July. The vessel returned to Aberdeen on the morning of 18 July.

Results

The survey was completed successfully, with no time lost due to weather and no damage to the acoustic or fishing gear. The total mileage surveyed was approximately 2650 n.mi. with 1060 acoustic log intervals recorded, providing approximately 50 GB of data (*.raw and *.ek5 files). All acoustic data were scrutinised and saved as daily Echoview (*.EV) files. Two successful calibrations were carried out, which gave consistent results to within 0.08 dB for the 38 kHz transducer, 0.15 dB for the 18 kHz, 0.05 dB for the 120 kHz and 0.02 dB for the 200 kHz transducers. Fishing exercises were generally successful; 36 trawl hauls were carried out, of which 28 contained herring. In addition to length frequency data, a total of 1915 herring were sampled for weight, sex, maturity and otoliths. A subset of these were sampled for fat content.

Preliminary indications are that the amount of fish detected was in line with previous surveys. However, the distribution of fish was different from that in previous years, with most of the fish being detected towards the southern end of the area and none detected at the northern extremes. A number of large herring schools were detected towards the southern edge, between 58°30 and 59° just west of the meridian. Strong marks were also detected south west of Shetland and south west of Papa Bank (north west of Orkney). Many herring schools were of the typical tall pillar shape, but many were detected as diffuse layers very close to the seabed stretching for many miles. The new four frequency system on the drop keel worked extremely well, with the new 18 kHz in particular providing new insights into the identification of herring (generally improving its discrimination). A full stock estimate and survey report will be prepared shortly.

The new multisampler worked very well after further tests and final modifications during the first part of the cruise. Discrete samples could be taken at the specified depth and in many cases large catches of herring were obtained. Micronekton samples were also taken from various scattering layers. Acoustically, the system works very well and reports of the status of the frame bars are accurate. However, towards the end of the trip the dropping mechanism would often fail, presumably because of fouling on the net. This will need to be looked at when the system is used next time, although overall it has proved reliable enough to be used as the standard pelagic sampling tool for acoustic surveys in future.

A variety of oceanographic data were collected including salinity, temperature, fluorescence, light transmission and optical particle counts. A total of 36 deployments of the ARIES vehicle were made which, in addition to the above, collected integrated whole water column plankton data in two PUP nets and, on occasion, depth specific plankton samples.

P G Fernandes
23 July 2002

As seen in draft: P Ramsay