

R1/12

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

FRV *Scotia*

Cruise 1106S

REPORT

1-21 July 2006

Personnel

Paul Fernandes	(In Charge)
Sandy Robb	
Robert Watret	
Phil Copland	
Stephen Keltz	
John Dunn	
Jim Hunter	
Lindsay McPherson	Student, Aberdeen University
Alex Brown	MSc Student Aberdeen, 1st pt
Palap Tiptus	MSc Student Aberdeen, 1st pt
Hongyue Sun	Aberdeen University, 2nd pt
Nick Burns	Aberdeen University, 2nd pt

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 58°15'-61.45'N and 4°W to 2°E, excluding Faroese waters.
2. To obtain biological samples for echosounder trace identification using a pelagic trawl.
3. To obtain samples of herring for biological analysis, including age, length, weight, sex, maturity, ichthyophonous infection and fat content.
4. To obtain hydrographic data for comparison with the horizontal and vertical distribution of herring.
5. To obtain plankton samples map the distribution and abundance of zooplankton.
6. To test the multisampling pelagic cod-end.
7. To test the new Methot Isaacs Kidd nets.
8. To obtain holographic images of the low frequency scattering layer.

Out-turn Days Per Project: RV0504 – 21 days

Narrative

All gear was loaded in Aberdeen on 28 June. Scientific staff joined the vessel at 0800 UTC on 1 July and it departed at 0930 on the same day. A small meeting was held with all scientists to explain the objectives of the survey and to describe general operating procedures. The survey commenced just outside Aberdeen at 1000 on 1 July. Transects progressed northwards along lines of latitude, at spacings of 15 or 7.5 nautical miles (nmi). 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 in the early hours of the morning of Tuesday 4 July and the survey resumed afterwards at 0935 of the same day. A half landing took place on 11 July in Lerwick in accordance with rest provision for the working time directive and for the exchange of personnel (Alex Brown and Palap Tiptus for Nick Burns and Hongyue Sun). The vessel resumed surveying at 1100 on 12 July. West of the Shetland Isles, transects extended from the coast to the shelf edge or longitude 4° west. The survey was completed on 20 July at 1245. All four transducers were calibrated successfully once again in Scapa Flow on 20 July. The vessel returned to Aberdeen on the morning of 21 July.

Results

The survey was completed successfully, with no time lost due to weather and no damage to the acoustic gear nor fishing gear. The total mileage surveyed was approximately 2669 nmi with 1064 acoustic log intervals recorded, providing approximately 38 GB of data (*.raw 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 0.05 dB for the 38 kHz transducer, 0.4 dB for the 18 kHz, 0.01 dB for the 120 kHz and 0.11 dB for the 200 kHz transducers. Fishing exercises were generally successful; 40 trawl hauls were carried out, of which 25 contained more than 30 herring herring. In addition to length frequency data, a total of 2563 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 may be slightly less than previous surveys – this would be in keeping with the declining North Sea herring stock. The distribution of fish was also different to previous years, with many large herring schools being detected close to the coast of Shetland, at Sumburgh Head and at the northern tip of the Isles. Very little (none in fact) herring were detected at the northern extremes. A number of large herring schools were also detected towards the western edge, more or less along the 4° line at 59°45'N and also at the eastern edges close to 58°N. Some herring schools were of the typical tall pillar shape, but many were detected as more diverse forms, such as long layers in midwater or very close to the seabed stretching for many miles. East of the Shetland Isles a number of traces of Norway pout were detected as verified by trawl catches – the first major detections for several years. A full stock estimate for herring and survey report will be prepared shortly.

A total of 49 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. Oceanographic data (sea salinity and temperature) were collected from a CTD mounted on the ARIES vehicle.

The 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, once again, towards the end of the trip the dropping mechanism would sometimes fail, perhaps due to the lack of a fully charged battery and sometimes due to 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.

The new Methot Isaacs Kidd net was deployed and recovered successfully using the plankton crane, from the area adjacent to the hangar.

The holographic camera functioned for 2 days before developing a major fault which, despite numerous attempts, could not be remedied. A number of images were obtained from several deployments in and out of the low frequency scattering layers. There was an absence of bubbles in these images, but they were not clear enough to reveal the source of the scattering due to the longer range rods that were used in the first few days. Water samples were taken which may help to reveal the scattering source back in the laboratory.

P G Fernandes
13 September 2006

Seen in Draft: P Ramsay, OIC *Scotia*