

R1/12

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

FRV *Scotia*

Cruise 1004S

REPORT

1-22 July 2004

Ports

Departure: Aberdeen, 1 July
Half-landing: Lerwick, 12 July
Arrival and unloading: Aberdeen, 22 July

Personnel

John Simmonds	(In charge)
Sandy Robb	
Phil Copland	
Marco Kienzle	
Stephen Keltz	
Robert Watret	
Owen Goudie	
Angus Mair	Phd Student
Rita Santos	MSc Student Aberdeen, 2nd pt
Mathieu Woillez	ENSMP, 1st pt
Benjamin Heywood	St Andrews University, 2nd pt

Fishing Gear

Midwater trawl PT160
Methot trawl

Out-turn Days per project: 22 days, RV0406

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 echosounder trace identification using pelagic trawl.
3. To obtain samples of herring for biological analysis, including age, length, weight, sex, maturity and ichthyophonus infection.
4. To obtain photographic records for fish maturity analysis.
5. To obtain hydrographic data for comparison with the horizontal and vertical distribution of herring.
6. To obtain plankton samples for acoustic identification work.
7. To obtain plankton data using Utow.
8. To conduct SAT (Sea Acceptance Trial) on new EK60 echo sounder system.

Narrative

Scotia sailed at 1000 BST on 1 July 2004 and made passage to the Buchan Deeps to test deployment of the fishing gear and then proceeded to Scapa Flow and anchored to calibrate the acoustic instruments on all scientific sounders. At 0730 BST *Scotia* left Scapa Flow and commenced survey at 0820 BST at 58°26'N 2°59'W. The survey was carried out on east/west transects on a 15 n.mi. spacing progressing northwards between 2E or the Norwegian line, the Scottish mainland, and the Orkney and Shetland Islands from 0300 to 2300 BST. Additional short transects were added into the survey in areas of expected higher herring abundance around Shetland. *Scotia* broke off the survey at 2300 BST on 9 July at 60°56'N 0°42'W and docked in Lerwick at 0800 BST on 12 July for a mid cruise break. *Scotia* sailed again at 0800 BST on 13 July and recommenced the survey at 60°56'N 0°42'W at 1345 BST. *Scotia* continued the survey north to 61°56'N and then progressed southwards to the west of Shetland carrying out 7.5 n.mi spaced transects to the north west of Shetland and 15 n.mi. transects west of Shetland south to Orkney. *Scotia* finished the survey at 0930 BST on 21 July (58°45'N 3°20'W). *Scotia* then proceeded to Scapa Flow to carry out a second calibration of the acoustic instruments. *Scotia* departed Scapa Flow following a successful calibration of acoustic instruments at 1730 BST and sailed to Aberdeen and docked at 0530 BST on 22 July 2004.

Main Activities

Throughout the acoustic survey acoustic data was collected using a Simrad EK500 echosounder operating at 38, 120, 200 and 18 kHz, with raw data collected using EchoView software. The total amount of data exceeded 90GigaBytes of raw data. The data were scrutinised in board and the allocation to species carried out within Echoview.

Fishing with a PT160 midwater trawl was carried out on observed fish traces on an opportunistic basis. The locations of the trawl hauls are shown in Figure 1 and catch data summarised in Table 1. Forty pelagic trawl hauls were made of which, 38 contained more than 100 herring. In addition to 14,441 length frequency data a total of 3,881 herring were sampled for gonad, liver, and total weight, stomach fullness, sex, maturity, otolith and macroscopic evidence of ichthyophonosis infection. The thermosalinograph was run throughout the cruise, a total of 18 CTD and SVP stations were carried out - one per day at 2300 BST each night (Fig. 1). A total of 40 mini-logger daily temperature profiles were collected by attaching the mini-logger to all of the trawl hauls to provide information on temperature profiles between CTD stations. Thirty-nine Methot net stations were carried out for plankton samples.

Photographs of herring maturity stage were taken from fish at stages 1, 2, 3, 4, 5, 6 and 8 with intermediate stages also photographed from selected from hauls throughout the survey area. These will be combined with additional photographs to record the 8 stage maturity key used at the Marine Laboratory.

Results

All the survey objectives were met. The survey was completed successfully, with no time lost due to bad weather and only very minor limits to fishing due to netsonde cable failures. Fishing was particularly successful with no damage. The total mileage surveyed was approximately 2722 n.mi. (Fig. 1) with a total of 1,109 acoustic log intervals recorded. Two calibrations were carried out, which gave consistent results with a difference of less than 0.2 dB for the 38 kHz system. The second calibration was of a lower standard due to poorer weather conditions but was sufficiently accurate to establish that performance of the 38 kHz system had not changed. Continuous medium density concentrations of herring were found east of Poby Bank, and to the north of 61°20'N on the shelf. Medium density concentrations

of herring were found near the shelf break west of Shetland and to the north west of Orkney between 3° and 4°W. Fishing was very successful - the trawl results being characterised by the very high proportions of herring in pelagic tows giving herring and the very low level of catch of all other species. The trawl results were particularly notable for the fact that almost all pelagic hauls caught full sample amounts of herring and no Norway pout; this has never occurred before. Ichthyophonous infection within North Sea herring remains at a very low level, 4 in 3,881 of the herring examined, which is similar to last year (6 of 3,296). A full stock estimate and survey report will be prepared shortly.

J Simmonds
22 July 2004

Seen in draft: P Ramsay, Master, FRV *Scotia*

Circulation List: Cruise Programmes and Reports

SCOTIA VESSEL

Programmes - Mr J A Morrison for approval. Reports - Mr J A Morrison for approval.

Issue two copies of Record of Haul and Station Numbers pro-forma with Scientist-in-Charge's copy of *Scotia* and *Clupea* programmes.

Two xerox copies of track chart for reports to be sent to Dr L Rickards.

PROGRAMMES ONLY

Lab staff

~~Mr J T M Hunter~~
~~Mr T Reid~~
~~Mr P J Copland~~
~~Mr J Dunn~~
~~Mr A Beaton~~
~~Mr G Howard~~
~~Security~~

Non-lab staff

~~Island Cmdr Faroes (Faroes only)~~
~~Flag Officer, Denmark (Danish part of N Sea only)~~
~~Coastguard~~
~~G Lees~~

PROGRAMMES AND REPORTS

Lab staff

Mr J A Morrison
Capt R Denholm
Mr R S T Ferro) Fish Man team
Mr C Hall) progs only
Dr R M Stagg
Dr C Moffat
Mr M R Heath
Mr A Macdonald
D Lichtman (+ additional copy of track chart
of reports only)
Mrs E Morrison
CO/OIC of Vessel (*Scotia*) (to be faxed)
Library (2)
File

Non-lab staff

~~Library, Danmarks Fisk (reports only)~~
~~Mr J Mortensen (Faroes only)~~
~~Mr A Souplet (Fishing Cruises only)~~
~~Dr S Ehrich (Entering German Waters) (reports only)~~
W J McCurdy, Belfast
Technical Director, SFIA (J E Tumilty)
Dr L Rickards
Dr I Joint
Director – Havfor Inst, Norway
Dr S Ehrich
Monsieur le Chef du dépt, Nantes
Mr J C Brabant
Mrs van Duyvenvoorde
Dr J G Gordon
G Kane
R de Clerck
Mr B Stewart
Capt J Cannan (*Scotia* and *Clupea* only)
Controller Coastal Ops - A Stewart
Dr P Grieg-Smith
Mr H C Boyar
Dr R J A Atkinson
Mr H i Jákupsstovu
Mr C Bullimore (To be faxed: 01923 846392)

Laboratory Personnel on Vessel

John Simmonds	Stephen Ketz
Sandy Robb	Angus Mair
Robert Watret	Rita Santos
Phil Copland	Mathieu Woillez
Marco Kienzle	Benjamin Heywood

Fishery Officers at

Aberdeen
Lerwick