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FRV *Scotia*

Cruise 1007S

## **PROGRAMME**

29 June – 19 July 2007

### **Ports**

**Departure:** Aberdeen, 29 June

**Half-landing:** Lerwick, approx. 8 July

**Arrival and unloading:** Aberdeen, 19 July

**\*In setting the cruise programme and specific objectives, etc the Scientist-in-Charge needs to be aware of the restrictions on working hours and the need to build in adequate rest days and rest breaks as set out in FRS' Working Time Policy (which is published on the Intranet). In addition, the Scientist-in-Charge must formally review the risk assessments for the cruise with staff on-board before work is commenced.**

### **Personnel**

Paul Fernandes	(In Charge) Part 1
Dave Reid	(In Charge) Part 2
Mike Stewart	
Sarah Clarke	
Robert Watret	
Stephen Keltz	
Jane Mills	Part 1
Owen Goudie	Part 2
Jim Hunter	
Martin Burns	
Sascha Faessler	Student, FRS
Samantha Cox	Student, Aberdeen University (vegetarian)

### **Fishing Gear**

Midwater trawl PT160 x 3.

Multisampling pelagic cod-end with one fine mesh cod-end.

Gulf VII oceanographic sampling vehicle.

## Objectives

- 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.
- To obtain biological samples for echosounder trace identification using a pelagic trawl.
- To obtain samples of herring for biological analysis, including age, length, weight, sex, maturity, ichthyophonous infection and fat content.
- To obtain hydrographic data for comparison with the horizontal and vertical distribution of herring.
- To obtain plankton samples map the distribution and abundance of zooplankton.
- To obtain in-situ target strength data on herring using the autonomous echosounder mounted in a drop frame.
- To obtain live herring and live juvenile haddock for transport back to the laboratory.

## Procedure

All gear will be loaded onto the vessel on Wednesday 27 June. The vessel will depart on 29 June and head straight for the survey start point just outside Aberdeen. The first transect proceeds east for approximately 120 nmi out to 1°45'E, followed by the second transect coming back west for a similar distance. After these two initial transects, the vessel will head for Scapa Flow, Orkney Islands, where calibration of all echosounders will take place (approximately 8-12 hours).

The survey will recommence after calibration and follow a pattern of parallel transects running east/west, at normal steaming speed (approximately 10 knots), progressing northwards, along the east side of Orkney/Shetland, and southwards along the west side. The survey area is bounded by 57°-61.45'N and 02°E-04°W. A half landing will take place on approximately 8 July in Lerwick to allow for the transfer of staff: notably a change in the Scientist in Charge (Paul F will be replaced by D Reid). The survey will be completed in the south-western part of the area to coincide with the acoustic survey in the adjacent area (ICES division VIa). A calibration will be conducted either east of Shetland or in Orkney at the end of the cruise if time permits.

Acoustic data will be collected at four frequencies (18, 38, 120 and 200 kHz) between 0300 and 2300 hours. Fish shoals seen on the echosounder will be identified using a pelagic trawl (PT160). Trawling operations will be carried out between two and four times per day; in addition, trawling may also be required between 2300 and 0300 hours to obtain species verification data and length samples for the target strength studies (see below). Samples of all species caught will be measured for length to partition the echo integral amongst species and size classes for target strength functions. Fish will also be weighed to establish a length-weight relationship. Otoliths will be collected from a sub-sample of the herring to determine age; the state of maturity and presence of Ichthyophonous infection will also be recorded. The fat content of herring will be measured with a handheld fatmeter. Jellyfish will be counted and a sample taken to measure umbrella diameter.

Where required, a Gulf VII tow will be carried out immediately following a pelagic trawl. The decision to carry this out will be based on achieving at least one CTD & plankton cast in each ICES rectangle. The Gulf VII will be equipped with: a CTD to measure temperature and salinity and zooplankton nets. Only the CTD will be used on every haul. The ships thermosalinograph will be run continuously to obtain sea surface temperature and salinity throughout the survey area.

In-situ target strengths from herring will be obtained by lowering the autonomous echosounder into area where fish schools have been detected using the drop frame. The drop frame will be deployed from the hanger deck and monitored with an onboard camera. This activity will take place between 2300 and 0300. Trawling may be required to obtain biological samples from the fish schools. Passage may be required to suitable locations, but the bridge watch should ensure that at the end of this period (0300) the vessel is at the end point of the survey from the previous night.

In addition, some live herring and live juvenile haddock will be collected using the protected cod end cover. This will take place between the periods 2300 – 0300. The fish will be transferred to holding tanks and offloaded in Aberdeen for transfer to the FRS aquaria.

Normal contact will be retained with the Marine Laboratory and the appropriate Fisheries Officers. Radio contact will also be maintained with the other vessels taking part in the internationally co-ordinated survey.

*J A Morrison*  
25 June 2007