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MFV *Sunbeam*

Survey 0716H

## **PROGRAMME**

26 June – 15 July 2016

### **Ports**

**Loading:** Fraserburgh, 23 June 2016

**Departure:** Fraserburgh, 26 June 2016

**Half-landing:** Lerwick, 4 July 2016 (TBC)

**Arrival and unloading:** Fraserburgh, 15 July 2016

In setting the survey 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 Marine Scotland's Working Time Policy (Lab Notice 34/03). In addition, the Scientist-in-Charge must formally review the risk assessments for the survey with staff on-board before work is commenced.

In the interest of efficient data management it is now mandatory to return the Survey Report, to I Gibb and the Survey Summary Report (old ROSCOP form) to M Geldart, within four weeks of a survey ending. In the case of the Survey Summary Report a nil return is required, if appropriate

### **Personnel**

E. Armstrong (SIC)

M. O'Malley

A. Tait

J. Dooley

M. Kinghorn (Part 2)

M. Parfitt (Part 1)

**Estimated days by project:** 20 days – RV1613 (20388)

### **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°30'-62°N and from the shelf edge to 2°E, excluding Faroese waters. In addition acoustic transects will be carried out in Moray Firth, by Scotia, to estimate abundance of herring and sprat.
- To obtain biological samples for echosounder trace identification using a pelagic trawl.
- To obtain samples of herring (and sprat) for biological analysis, including age, length, weight, sex, maturity and ichthyophonous infection.

## Procedure

All scientific equipment and sonar section container will be transported to Fraserburgh on 23 June to be installed on the vessel. The vessel will depart early on 26 June and make passage to Scrabster to pick up E Armstrong. The vessel will then continue to Scapa Flow, Orkney Islands, to perform a calibration of the EK60 (approximately 8-12 hours at anchor).

On completion of the calibration the vessel will make passage to the start of the first transect. The whole survey area is bounded by 58°30'-62°N and 04°W - 02°E to the 200 m contour. Scotia will provide coverage of the Moray Firth, which is required this year. Transect spacing is 15 nm depending on herring densities encountered in previous years. The proposed survey design is shown in Figure 1. This may be adapted during the survey to maximize area coverage, given the time available.

A 24 hour mid survey break will take place on approximately 4 July in Lerwick (TBC) to allow for the exchange of staff and to comply with the WTD policy. A calibration will be conducted around the mid survey break in a suitable location, or in Orkney at the end of the survey, if time permits.

Acoustic data will be collected at three frequencies (38, 120 and 200 kHz) between 03:00 and 23:00 hours. Fish shoals seen on the echosounder will be identified using the vessels pelagic trawl. Survey trawling operations will be carried out up to three times per day at any time between 03:00 and 23:00. 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 according to the following length stratified scheme to determine age; two per 0.5 cm class below 22 cm, five per 0.5 cm class from 22.5-27.5 cm and ten per 0.5 cm class for 28.0 cm and above. For each herring in the subsample the state of maturity, gonad weight, liver weight, whole and gutted weight, presence of food in the stomach as well as the presence of *Ichthyophonus* infection will be recorded. The maturity scale used throughout the survey will be the Scottish 8 stage scale. Where sprat is encountered 5 per 0.5cm length class will be sampled for age, weight, sex and maturity.

The vessel will return to Fraserburgh on the morning of the 15 July, where equipment will be unloaded for return to Aberdeen. Staff will return to the laboratory by minibus.

Normal contact will be maintained with the Marine Laboratory. Radio and e-mail contact will also be maintained with the other vessels taking part in the coordinated survey.

Submitted:  
E. Armstrong  
14 June 2016

Approved:  
I. Gibb  
17 June 2016

**Figure 1:** Area to be covered and proposed preliminary survey track Scotia 0916S/Sunbeam 0716H. Other tracks may be added depending on available survey time.

