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MRV *Scotia*

Survey 0920S

PROGRAMME

3-26 July 2020

Ports:

Loading: Aberdeen, 30 June 2020

Departure: Aberdeen, 03 July 2020

Half-landing: None (Covid-19 measure)

Arrival and unloading: Aberdeen, 26 July 2020

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.

Estimated days by project: 22 days – RV2009 (20583), 2 days - ST05B

Sampling Gear

Midwater trawls PT160 x 3

SIMRAD FS70 net sonde x 2

1 SBE19+ CTD & laptop and salinity bottles surface only.

Hydrographic mooring recovery equipment.

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.
- To obtain biological samples by trawling with pelagic for echosounder trace identification.
- To obtain samples of herring and sprat for biological analysis, including age, length, weight, sex, maturity throughout the survey area.
- Collect samples and data for stock identity determination of herring. Otoliths for morphometric stock ID analysis for herring caught west of 4 °W. Herring will be collected and stored for genetic analysis throughout the survey area, tissue samples will be taken for analysis after returning from the survey. This is another measures adopted as part of the Covid-19 restrictions for this survey.

- To obtain hydrographic data for comparison with the horizontal and vertical distribution of herring and sprat.
- Collect near sea bed dissolved oxygen measurements for MSS monitoring programme.
- Recover ADCP moorings from the Faroe Shetland Channel and the Fair Isle Channel. Recover and freeze sponge settlement plates attached to ADCP moorings in the FaroeShetland Channel

Procedure

Due to COVID19 Health and Safety guidance, the specific 2020 survey related changes on 0920S include: no demersal trawling, reduced MSS staffing and no half landing. Staff will receive compensatory rest days at the end of the survey for compliance with WTD regulations.

All fishing gear and scientific equipment will be loaded onto the vessel on 30 June in Aberdeen. The vessel will depart from Aberdeen on 3 July and after required vessel drills, make passage to Scapa Flow, Orkney Islands, where calibration of all echosounders will take place (approximately 8-12 hours at anchor). Crew training and trial deployments of fishing gear will take place on the way as required by the fishing master.

After finishing calibration, the vessel will make passage to the start of the first eastern transect and follow a pattern of parallel transects running east/west, at a steaming speed of (10.5 knots), progressing northwards. The whole survey area is bounded by 58°30'-62°N and 02°E to the 200 m contour. Transect spacing is 15 nm. This may be adapted during the survey to maximize area coverage given the time available. The proposed survey design is shown in Figure 1.

A second confirmatory calibration will be conducted in a suitable location, probably Scapa, at the end of the survey if time permits.

Acoustic data will be collected at four frequencies (18, 38, 120 and 200 kHz) between 03:00 and 23:00 hours (BST). Fish shoals seen on the echosounder will be identified using a pelagic trawl (PT160) in consultation between fishing master and scientific staff. Survey trawling operations will be carried out between two and four 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. Individual herring, sprat and mackerel 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, whole and gutted weight, will be recorded. The maturity scale used throughout the survey will be the Scottish 8 stage scale.

Genetic sampling of herring for qualitative purposes will be carried out on selected hauls throughout the survey area. 100 herring per row of ices rectangles will be sampled, on either side of the northern isles. All hauls performed west of the 4 degree line will have a random sample of 100 herring taken. Genetic sampling will be undertaken at the Marine Laboratory at a later date.

Where sprat is encountered, five per 0.5 cm length class will be sampled for age, whole weight, sex, maturity and gutted weight.

This year's surveys contribution to the EASME/WestHer project, in its provision of morphometric and genetic samples, has been significantly paired back. This is in an effort to reduce required staff hours performing biological sampling. The details of this sampling are above.

A vertical hydrographic dip to collect temperature, salinity and dissolved oxygen measurements will be carried out immediately following PT160 trawls. The decision to carry out additional vertical dips will be based on the requirement to achieve one station in each ICES rectangle.

Surface water samples will be collected from continuous flow tap in the fish house.

The ships thermosalinograph will be run continuously to obtain sea surface temperature and salinity throughout the survey area.

At suitable locations and times during the acoustic survey, the vessel will head to recover the hydrographic ADCP moorings as listed below and shown in Figure 2.

Mooring Positions (Recovery)

NWEX	61° 10.99' N	002° 24.908' W	Long (100 m) single string mooring
NWEZ	61° 09.39' N	002° 17.52' W	Short single string mooring
FIGN	59° 46.61' N	001° 31.90' W	AL-200 trawl-resistant bed frame
FIGS	59° 30.37' N	002° 05.08' W	AL-500 trawl-resistant bed frame

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

The vessel will return to Aberdeen for unloading on 26 July 2020.

Submitted:
S O'Connell
22 June 2020

Approved:
I Gibb
23 June 2020

Figure 1: Transects to be completed by Scotia 0920S. Additional transects may be added depending on available survey time. Includes proposed survey track to collect moorings North West of Shetland

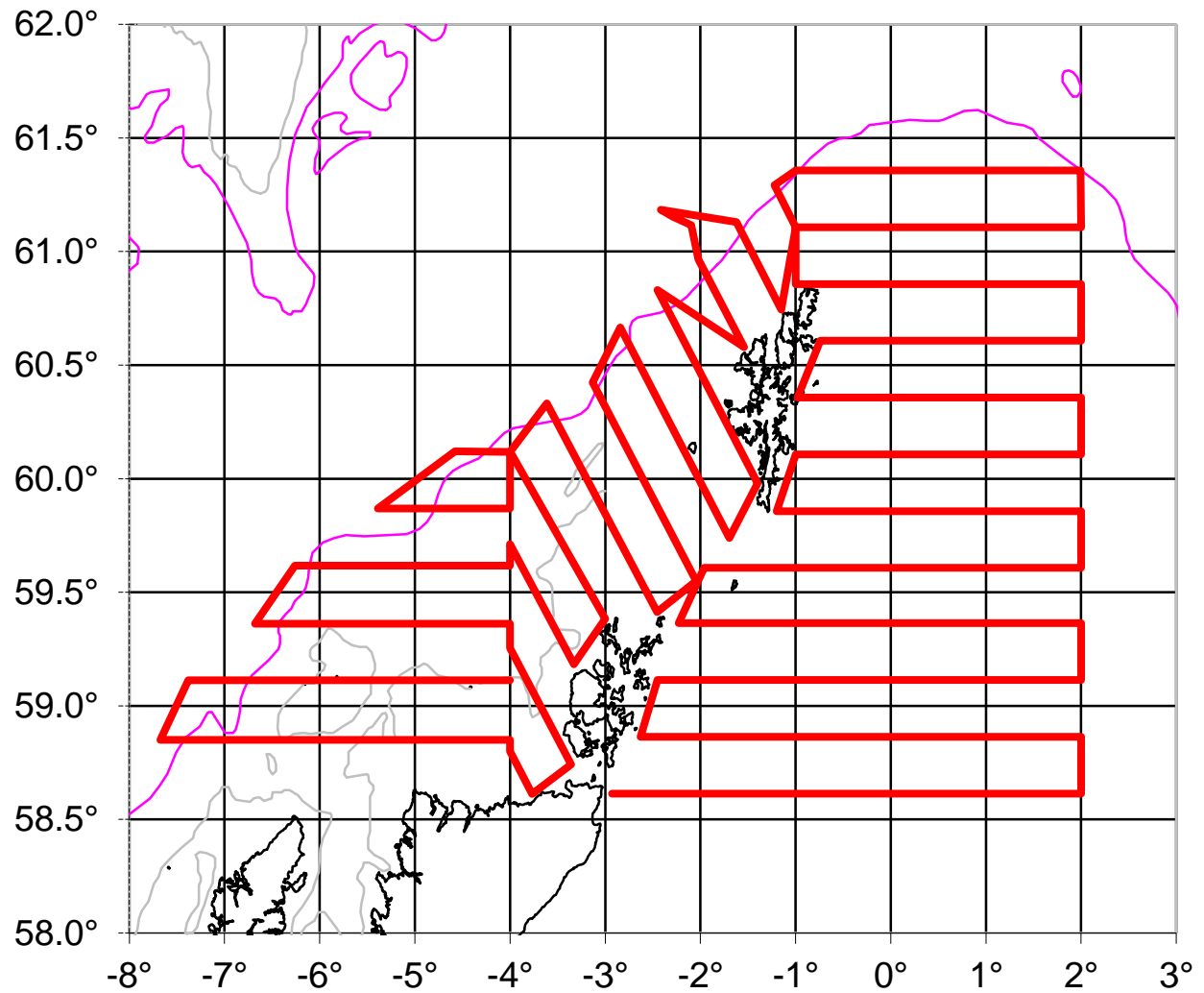


Figure 2: Hydrographic mooring locations.

