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MRV *Scotia*

Survey 0921S

PROGRAMME

Dates: 6-26 July 2021

Ports
Loading: Aberdeen, 04 July 2021
Departure: Aberdeen, 06 July 2021
Port Call: Fresh water top-up only (Covid-19 measure)
Arrival and unloading: Aberdeen, 26 July 2021

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: 21 days – RV2109 (20664)

Sampling Gear

Midwater trawls PT160 x 3
BT 237 x 1
SIMRAD FS70 net sonde x 2
Scanmar trawl eye sensor
CTD & laptop and salinity bottles surface and depth (96 bottles total).
Niskin bottle x 2

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 58º30'-62ºN and from the shelf edge to 2ºE, excluding Faroese waters.

- To obtain biological samples by trawling to confirm echosounder trace identification.

- To obtain samples of herring and sprat for biological analysis, including age, length, weight, sex, maturity and ichthyophonus infection throughout the survey area.

- Collect tissue samples and data for stock identity determination. Tissue samples for genetic analysis will be collected from herring throughout the survey area.

- To obtain hydrographic data for comparison with the horizontal and vertical distribution of herring and sprat.

Procedure

All fishing gear and scientific equipment will be loaded onto the vessel on 3 July in Aberdeen. The vessel will depart from Aberdeen on 6 July and after required vessel drills, make passage to the start of the first transect to begin surveying. Crew training and trial deployments of fishing gear will take place on the way if required by the fishing master. The vessel will follow a pattern of parallel transects running east/west, at normal steaming speed (10.5 knots), progressing northwards. The whole survey area is bounded by 58º30'-62ºN and 02ºE 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.

Calibration of all echosounders (requires approximately 8-12 hours at anchor) will take place prior to the port call for fresh water and the disembarking of D Copland.

A second confirmatory calibration will be conducted in a suitable location (possibly 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 viewed on the echosounder will be identified and confirmed using a pelagic trawl (PT160) in consultation between fishing master and scientific staff. Survey trawling operations will be conducted between two and four times per day during 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, liver weight, whole and gutted weight, presence of food in the stomach as well as the presence of Icthyophonus infection 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.

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

In the area west of 4ºW, in addition to the above described sampling, random sampling of 100 fish above 24 cm length will be carried out for each haul containing >30 herring a tissue sample taken for genetic analysis. Otoliths from these fish will, subsequent to aging, be made available for morphometric analysis. Additional fish will be collected to ensure the relevant numbers of fish are collected per strata for acoustic data analysis.

A vertical hydro dip to collect temperature, salinity and dissolved oxygen measurements will be carried out immediately following trawls, this will require the vessel to use its DP system to remain on station. 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 fish house while samples form depth will be taken using the Niskin bottle.

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

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.

Submitted:
S O'Connell
11 June 2021

Approved:
I Gibb
23 June 2021

Figure 1: Transects to be completed by Scotia 0921S. Additional transects may be added depending on available survey time.