

R1/7

In Confidence - Not to be quoted without reference to the Laboratory

Cruise 13/80

13MR80

FRV. MARA

4-21 November 1980

REPORT

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Objectives

To investigate the structure of fish schools and to assess the effects of changes in these structures on acoustic abundance estimation techniques.

Narrative

Gear was loaded in Buckie on 4 November. On 5 November MARA left Buckie at 7.00 and searched for fish concentrations in the upper Moray Firth. After an overnight stay at Invergordon, the Inverness Firth was surveyed and, due to an adverse weather forecast, MARA returned to Buckie, arriving at 18.45. The weather on 7 November was unsuitable for working near Buckie.

On 10 November, MARA steamed to Invergordon. On 11 and 12 November the Cromarty Firth and Inverness Firth was surveyed, and on 13 November the vessel steamed to the outer Dornoch Firth where she anchored overnight. On 14 November she returned to Buckie.

MARA returned to Invergordon on 17 November and, due to poor weather conditions was restricted to working in the Cromarty Firth on the 18 and 19 November. On 20 November, the area off Nairn was surveyed and the vessel returned to Buckie, arriving at 17.45. Equipment was unloaded on 21 November.

Techniques

Two different methods of observation were used to collect data on the structure of fish schools; underwater TV and a stereo camera. The TV camera was mounted in a frame supporting lights, a still camera and a heel/pitch meter which measured the angle of the camera axis to the horizontal. The stereo-camera was used with flash-lights and had a small echo-sounder transducer mounted on the same frame. When a shoal was identified on the vessel's echo-sounder, she was manoeuvred so as to drift over the shoal and one of the camera frames was lowered to the appropriate depth.

Underwater light measurements was made routinely during the cruise using one of the laboratory's standard photomultiplier systems. No diving was undertaken and no opportunity arose for observing shoals with a portable echo-sounder in an inflatable boat.

Results

The upper Moray Firth was selected for this exercise as sprat concentrations are normally found there during this period to the year. Very few shoals were found however, and it proved difficult to manoeuvre the cameras into these shoals because of their small size and the high turbidity of the water. The largest concentrations were found off Golspie on 13 and 14 November and off Nairn on 20 November. No useful data was obtained with the TV equipment and the stereo camera film has yet to be developed.

On 20 November, when relatively dense schools were found, it still proved difficult to drop the camera close to the schools. The echo-sounder observations suggested that the fish dispersed from under the ship, as strong echoes were observed only when the vessel was moving through the water. When MARA hove-to the echoes disappeared. The presence of denser traces on 20 November suggested that the fish were later than usual in moving into the area.

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25 November 1980

Seen in draft: W B Reid