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MINISTRY OF AGRICULTURE, FISHERIES AND FOOD
FISHERIES LABORATORY, LOWESTOFT, SUFFOLK, ENGLAND

1979 RESEARCH VESSEL PROGRAMME

REPORT: RV CORELLA: CRUISE 10

(PROVISIONAL: Not to be quoted without prior reference to the author)

STAFF:

R J Wood
J P Bridger
W L Huggins
R Halliday )
P King ) Heriot-Watt University } 23-30 August
S Warnes
I Laing (Conwy) } 30 August-5 September

DURATION:

Left Lowestoft 0930h, 23 August
Arrived Lowestoft 0625h, 5 September
All times are Greenwich Mean Time.

LOCALITY:

Central North Sea.

AIMS:

1. To study the diurnal behaviour pattern, particularly the vertical migration, of spawning herring off the Yorkshire coast.

2. To examine visually the sea bed in the spawning area using PK 1 (underwater vehicle provided by Heriot-Watt University) and attempt to locate deposits of herring eggs.

3. To make trial acoustic surveys of spawning herring using a transducer mounted in a towed body in conjunction with the echo integrators.

4. To observe the reaction of near surface herring shoals to the approach of both the research vessel and towed body using the mini scanner.

5. To carry out a survey for herring larvae in the western half of the central North Sea, as part of an international survey of the abundance and distribution of autumn-spawned herring larvae in the North Sea and adjacent waters.

6. To investigate the effect of different "washing down" techniques on samples of very small herring larvae obtained with a high-speed sampler.

NARRATIVE:

CORELLA sailed from Lowestoft at 0930h, 23 August and set course northwards. An echo survey was commenced at 2245h off Filey and by 1055h

next day an area extending from 6-12 miles offshore between approximately the latitudes of Filey and Whitby had been covered. Within this area a patch of typical herring "plume" type traces, roughly 6 miles in diameter, was located with its centre some 9 miles off Robin Hood's Bay. During the afternoon 24 August a number of lowerings were made with the Heriot-Watt underwater vehicle PK 1 (fitted with both TV and film cameras) while the ship drifted. A second echo survey was commenced at 1910h covering the same area as before but worked in the opposite direction. This survey was completed by 0520h 25 August. The patch of 'plume' traces was again located but it had a somewhat more northerly distribution than during the previous night. During daylight hours 25 August a number of further lowerings of PK 1 were made in various localities off Robin Hood's Bay. A number of transects were run with the echo sounder over the supposed herring spawning patch off Robin Hood's Bay between 1700h - 2100h, in order to ascertain its exact position, and a first integrator survey then run over the patch from 2140h 25 August to 0400h 26 August.

Between 0800h - 1800h an echo survey was made over the area off Whitby/Skinningrove from approximately 5-11 miles offshore and a second integrator survey run over the most promising section from 1830h 26 August to 0500h 27 August. Poor weather conditions prevented further work until 1752h when a third integrator survey was commenced over the Robin Hood's Bay patch. This was completed by 0440h 28 August when course was set northwards. An echo survey was made between the Coquet and Farne Islands from 1220h - 1600h and a patch of 'plume' type traces located some 3 miles off Beadnell Bay. The fourth integrator survey was made over this patch between 1700h - 2210h 28 August and a number of lowerings with PK 1 made at various positions within the area of this patch next day. An echo grid was covered during the evening 29 August in order to observe the behaviour of the fish shoals giving the 'plume' type traces at dusk and in the early part of the night. Further lowerings of PK 1 were then made into various fish traces. Two more lowerings of PK 1 were made next morning on passage to Blyth where CORELLA docked at 1410h. PK 1 was off-loaded, Messrs Warnes and Laing joined the cruise and gear was prepared for the larval survey. After a delay of some hours because of dense fog CORELLA sailed from Blyth at 1200h 31 August. The high-speed plankton sampler was calibrated in free-flow and the herring larval survey commenced at 1449h in conditions of very poor visibility. 7 stations were completed and then CORELLA lay for some hours until the fog began to clear. The larval survey was resumed at 0500h 1 September and continued until 1800h 2 September when a new integrator survey was started to cover the Robin Hood's Bay area once more. This survey was extended eastwards during 3 September and 4 further plankton stations sampled over The Hills (western edge of Dogger Bank). CORELLA then moved westwards and surveyed an area off Flamborough Head during the night 3-4 September where fairly dense echo traces had been some some 30 hours earlier. The integrator survey was extended southwards during 4 September to cover the Dowsing herring spawning area and a further 6 plankton stations completed. After making noise measurements and various checks on the acoustic equipment the towed transducer was recovered and CORELLA set course for Lowestoft at 1935h. CORELLA docked next morning 5 September at 0625h.

AIM 1. Just prior to the cruise commercial demersal trawlers reported catching numbers of full herring off Robin Hood's Bay. By 2 September they were catching, in the same area, considerable numbers of cod feeding on herring and herring eggs. Plankton stations worked in the area 2 September contained very few herring larvae. It is therefore reasonable to assume that the concentration of fish shoals surveyed by CORELLA off Robin Hood's Bay consisted predominantly of herring either spawning or on the point of spawning. By day the shoals were very compact and mostly extended only a few metres above the sea bed. After dark the fish remained in shoals although these were generally far less compact and rather higher above the sea bed - few above 30 metres when the bottom depth was approximately 55-60 metres. Exceptionally a very small number of shoals extended to within 10-15 metres of the surface and a few shoals were still very dense during the middle of the night. Once it began to get light the fish rapidly descended and shoals again became very compact. It appeared that most of the shoals were sufficiently dispersed for successful integratory surveys for almost 5 hours during the night from approximately 2200h to 0400h GMT.

The behaviour of herring in the Longstone area could not be assessed with certainty due to the presence of considerable numbers of sandeels (observed with the TV camera on PK 1). However traces of the 'plume' type were found off Beadnell Bay where commercial demersal trawlers, at the same time, were catching reasonable numbers of ripe herring. A considerable number of newly hatched herring larvae were taken close by in a plankton haul. Traces of the 'plume' type were observed to rise and then break up into a scattered trace in the top 15 metres or so at dusk. Identification was attempted with PK 1 but most fish were observed by the echo sounder to avoid the lights on the underwater vehicle. Some sandeels were seen, however, and in addition sprat or 0-group herring were seen at the surface in the stern lights as CORELLA drifted.

No concentrations of fish which might have been spawning herring were observed off Whitby/Skinningrove or at the Dowsing.

AIM 2. Using PK 1 the sea bed in the herring spawning areas off Robin Hood's Bay and Beadnell Bay was seen to consist chiefly of stones and rocks with a few patches of small stones. No herring spawn was identified. PK 1 proved useful in identifying sandeel shoals off Beadnell Bay and one herring shoal was also seen in this area.

AIM 3. A number of successful acoustic surveys was made but it will be some time before the results can be properly evaluated.

AIM 4. No observations were made on surface shoals. The fish at the surface appeared to be very dispersed and were not picked up by the mini scanner.

AIM 5. A survey grid comprising 35 stations, covering all the important inshore herring spawning grounds off the English north-east coast, was completed between 31 August and 4 September using the 20-inch high-speed plankton sampler. Small recently hatched herring larvae were taken in large numbers at only one station. This was a few miles south of the Longstone. In addition small numbers of larvae were taken at a few other stations in the Longstone area and at a few of those worked off the Yorkshire coast.

AIM 5. It had been planned to carry out this aim towards the end of the cruise, thus it was impossible to achieve owing to the lack of herring larvae in sufficient numbers off the Yorkshire coast.

R J Wood
4 September 1979

SEEN IN DRAFT: GS, RCN.

INITIALLED: AJL

DISTRIBUTION:

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