MR BATE

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

1975 RESEARCH VESSEL PROGRAMME

REPORT: RV CIROLANA: CRUISE 3B
(Provisional: Not to be quoted without prior reference to the author)

STAFF

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DURATION

Left Great Yarmouth 1725h 13 March

Arrived Humber 1640h 26 March

All times are Greenwich Mean time

LOCALITY

West of Scotland (Porcupine Bank - Rockall)

AIMS

1. To carry out an acoustic survey of Blue Whiting between Porcupine Bank and St Kilda/Rockall using the 'Humber' 30 KHz sounder and Simrad integrator.

2. To analyse single fish target strengths using cycle-counter/pulse height analyser and Simrad integrator/storage oscilloscope methods.

3. To obtain samples of Blue Whiting by fishing for maturation and length/age studies.

4. To rendez-vous with RV EXPLORER to carry out inter-ship calibration runs.

5. To co-ordinate by radio, fishing activities of TRS Vessel ARCTIC PRIVATEER. Contact will be made twice daily at 0930 and 2130 hours.

6. To make tows with the Continuous Plankton Recorder when practicable.

7. To carry out surface temperature and salinity observations over the survey area.

NARRATIVE

After leaving Yarmouth CIROLANA made passage via the English Channel to the beginning of the survey grid on the edge of the continental shelf south west of Ireland (50°30'N 11°00'W) where the acoustic survey commenced at 1945h 15 March. This continued in good weather conditions until 18 March when the vessel was forced to dodge overnight in a SE'ly gale. Work was

resumed the following morning and continued until 20 March when it was further interrupted by a S'ly gale which again forced overnight dodging. The wind then backed to a NW'ly direction and remained in this quarter at force 6/8 for the remainder of the survey, which resulted in very difficult working conditions due to heavy swell.

On 24 March a rendezvous was achieved with RV EXPLORER and a successful intership calibration exercise was carried out over a 6 hour period. After completion of this work at 0030h 25 March CIROLANA set course for the homeward run and eventually anchored in the Humber at 1640h on 26 March after making a good passage via the Pentland Firth.

The scientific staff disembarked by tug the following morning at 0715h because the fishermens' blockade of the port of Grimsby prevented the docking of CIROLANA.

RESULTS

The attached chart shows the vessel track, positions of hydrographic and trawl stations, and an approximate boundary for the distribution of Blue Whiting type echo-traces within the survey area.

Aim 1: The Acoustic Survey

Two Simrad integrator units were used, each providing two channels. The first was set to record integrated voltages per nautical mile at two gain settings (10 & 20 dB), whilst the channels on the second unit were used to record voltages per sounding, one over the same range and gate used for the integrated voltage channels, and the other kept at a fixed range and gate (499-549 metres) to record reverberation noise levels when depth permitted, or in deeper water the signals from extreme range.

The TVG amplifier was used in its 20 log R mode with no preamplifier gain (X1 setting). The gain settings used for the integrated voltages per nautical mile proved capable of handling most of the signals received, although the 20dB channel did saturate on some of the denser concentrations encountered. The survey was undertaken at a constant speed of 8 knots.

The echo-traces associated with blue whiting showed extreme patchiness in their distribution, although in a few places more continuous denser layers were found extending over distances of several miles. The best concentrations were found around the western and northern side of the Porcupine Bank and over the northern end of the Rockall Channel. Elsewhere, the fish occurred mainly as a very thinly dispersed layer with irregularly distributed denser patches and larger shoals here and there. Very little was found to the west of Rockall or in water depths less than about 280 metres.

The 'Myctophid' layer was recorded over most of the survey area and this showed clearly defined diurnal changes in vertical distribution. In full daylight it was mainly distributed within the 100-250 metre depth zone, whereas at night it was mainly confined within the upper 100 metres, and showed fairly rapid changes in depth distribution at dawn and dusk.

The blue whiting traces did not show such clear cut changes in their day and night vertical distributions. In daylight over deep water they were mainly noted between 380-500 metres and in shallow water between 300-400 metres. In darkness most were still found within the daylight depth zones although some rose to about 300 metres in the deeper water areas. The

minimum depth at which the blue whiting layer thinned out to zero was generally about 280 metres on the banks and continental shelf margin. Noise measurements were also carried out at different speeds.

Aim 3: Fish Sampling

Fishing was restricted by time and weather. Three hauls were made, but only one of these (NW side of the Porcupine Bank) yielded blue whiting. On the other two hauls the headline transducer failed to operate effectively, probably caused by cable snags pulling the unit away from its correct aspect.

The successful tow resulted in a catch of 94 baskets (about 3 tons) for 1 hours' effective fishing (net within the depth range of the shoals).

The fish showed a length range mainly falling within the limits 24-34cm, with an average length of 29.7cm. The majority were in the earlier stages of maturation (1-3), with very few ripe running fish. Otolith samples were also taken for ageing.

Aim 4: Intership Calibration Exercise with RV EXPLORER

This was delayed by bad weather and the rendezvous was not achieved until 1800h 24 March. However, the two vessels were able to conduct a parallel survey over a limited box grid for a period of 6 hours, a total distance of 48 nautical miles being covered in this time. Fish traces were fairly plentiful over most of the grid and it is hoped that the results will enable intercalibration of the two different types of acoustic equipment.

Aim 5: Contact with ARCTIC PRIVATEER

The fishing activities of the ARCTIC PRIVATEER were monitored by radio contact twice daily when she was operating. Her activities over the period 19-25 March were concentrated within the limited area shown on the accompanying chart and her reported catch rates on successful tows were about 50-60 baskets per haul. She has so far lost several days fishing due to bad weather, net damage, and crew trouble requiring the replacement of the cook.

Aim 6: Continuous Plankton Recorder

This was towed over a large part of the grid, the first 500 miles being successfully accomplished. Unfortunately, the second mechanism used was found on hauling to have jammed shortly after launching due to the fusee wire breaking. This resulted in the silk folding up on itself and not being taken up into the preserving tank.

Aim 7: Hydrographic Observations

A total of 24 hydrographic stations were carried out, which included XBT casts and surface temperature and salinity observations. The thermograph was also run continuously over the survey grid.

P O Johnson
7 April 1975

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DISTRIBUTION

Basic list

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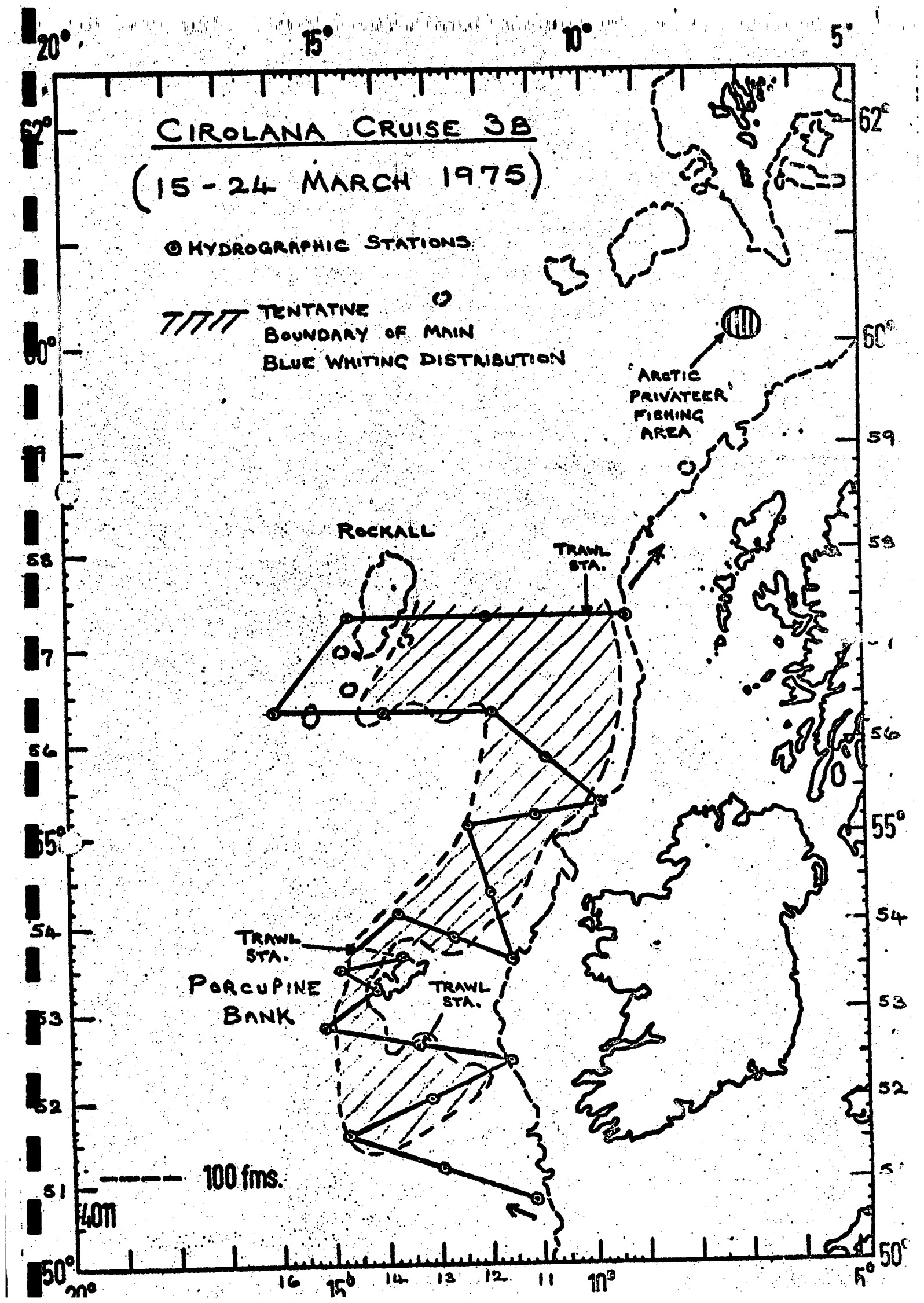
CIROLANA CRUISE 3B
(15 - 24 MARCH 1975)
HYDROGRAPHIC STATIONS
TENTATIVE BOUNDARY OF MAIN BLUE WHITING DISTRIBUTION
ARCTIC PRIVATEER FISHING AREA
ROCKALL
TRAWL STA.
TRAWL STA.
PORCUPINE BANK
TRAWL STA.
100 fms.
4011
20°
15°
10°
5°
62°
60°
59
58
57
56
55°
54
53
52
51
50°
16
15°
14
13
12
11
10°
5°