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

1977 RESEARCH VESSEL PROGRAMME

REPORT: RV CIROLANA: CRUISE 4

STAFF

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DURATION

Left Grimsby 1810 h 6 April
Arrived Grimsby 1145 h 27 April

LOCALITY

Celtic Sea, Porcupine Bank, Rockall Channel, West of Hebrides.

AIMS

1. To carry out a mackerel egg and larval survey in the Celtic Sea - Porcupine Bank area.
2. To study the vertical distribution of mackerel eggs and larvae.
3. To study the development rates of mackerel eggs and larvae.
4. To identify fish concentrations by trawling.
5. To measure temperature, salinity and chlorophyll levels at each station using the environmental monitoring system.
6. To carry out in situ target strength measurements on blue whiting where suitable concentrations are found.
7. To catch and biologically sample blue whiting.
8. To collect fish samples for mercury content analyses.
9. To collect material from as wide a range of species as possible for histological muscle fibre analysis.
10. To collect and deep freeze spleens from blue whiting/mackerel for the Institute of Cancer Research.

NARRATIVE

CIROLANA left Grimsby at 1810 (G.M.T.) 6 April and made passage to the western end of the English Channel where the mackerel egg and larval survey commenced on 8 April. This was then successfully completed by 16 April in generally good weather conditions. An acoustic survey grid then commenced along the northern side of the Porcupine Bank to find concentrations of blue whiting suitable for acoustic measurements. However, such concentrations were not located until 18 April when a dense layer of fish was found along the edge of the continental shelf to the south west of St Kilda. After fishing to identify these traces acoustic measurements were then carried out by lowering a transducer and frame, with standard target attached, into the fish layer. The remainder of the voyage was then spent in the general area west and northwest of the Hebrides along the margin of the continental shelf, where further fishing and acoustic observations were made. This work was interrupted by a severe south-westerly gale on 20-21 April, and was terminated early on 25 April by a very severe southerly gale. After this a return passage was made to Grimsby via the northern route around Orkney, and CIROLANA eventually docked at 1145 h (GMT) 27 April.

RESULTS

1. Double oblique hauls down to 100 metres depth were made with a 0.76 m diameter high speed townet at 74 stations over the Celtic Sea-Porcupine Bank region to determine the distribution and abundance of mackerel eggs and larvae (Chart 1). In addition a continuous plankton recorder was towed at a depth of 10 metres between each townet station. This was also used over a large part of the survey grid further north and in all was towed over a distance of 1820 nautical miles.

2. The environmental monitoring recorder was run continuously over the egg and larval grid and this provided measurements on surface temperature, salinity, chlorophyll level, dissolved oxygen, pH and turbidity of the sea water. In addition chlorophyll extracts and estimations were made on each station using filtered samples of phytoplankton.

3. The Longhurst-Hardy plankton recorder was used at 11 stations down to a maximum depth of 695 metres in order to study the vertical distribution of mackerel and blue whiting eggs and larvae.

4. No further work on the development rates of mackerel eggs and larvae was carried out because the mackerel caught were not in ripe running condition. However, blue ling eggs were obtained and artificailly fertilized, maintained in vivo and their development studied.

5. The best concentrations of blue whiting within the area surveyed (see chart No. 2) were found southwest and west of St Kilda (57°-58°30'N) close to the edge of the continental shelf, within their usual depth range of 300-400 metres. Traces were very thin or absent over the deeper water and became less abundant or absent along the shelf edge north from about 58°30'N.

   The samples of blue whiting caught showed most fish in the length range 25-35 cm, with a modal length of 31 cm, and the majority were spent.

6. The deep water transducer unit was lowered to within 20 metres of the blue whiting aggregations and amplified echoes from single fish were recorded on magnetic tape for future analysis. About 3 hours of successful recordings were made containing some 2 000 single target signals.

7. Samples of blue whiting were deep frozen for mercury content analysis.

8. Granton trawl hauls were made at 14 stations covering a depth range of 120-1000 metres and these yielded a wide variety of species for histological and biochemical sampling.

   Grenadiers, black scabbard fish and blue ling predominated in the deepest hauls (650 - 1000 metres), blue whiting along the upper slope of the shelf (300 - 400 metres) and haddock, pollack, ling, gurnards, spurdogs, spotted dogfish and mackerel in the shallower water tows (120 - 150 metres).

9. Grenadiers, fork-beard hake, blue whiting, haddock and mackerel were sampled to provide 167 samples for muscle enzyme (ATPAs) analysis, with a further 135 heart and 110 muscle samples deep-frozen for dry weight content.

   In addition 72 heart and muscle samples from blue whiting and mackerel were fixed in Bouin's fluid, and another 50 heart samples from a wider range of species preserved in formalin, for histological studies.

10. Samples of spleens from blue whiting, blue ling, ling and chimaeras were also taken and deep frozen for the Institute of Cancer Research.

P O Johnson
3 May 1977

SEEN IN DRAFT R A Taylor
W J Saxby

INITIALLED AJL

DISTRIBUTION

Basic List

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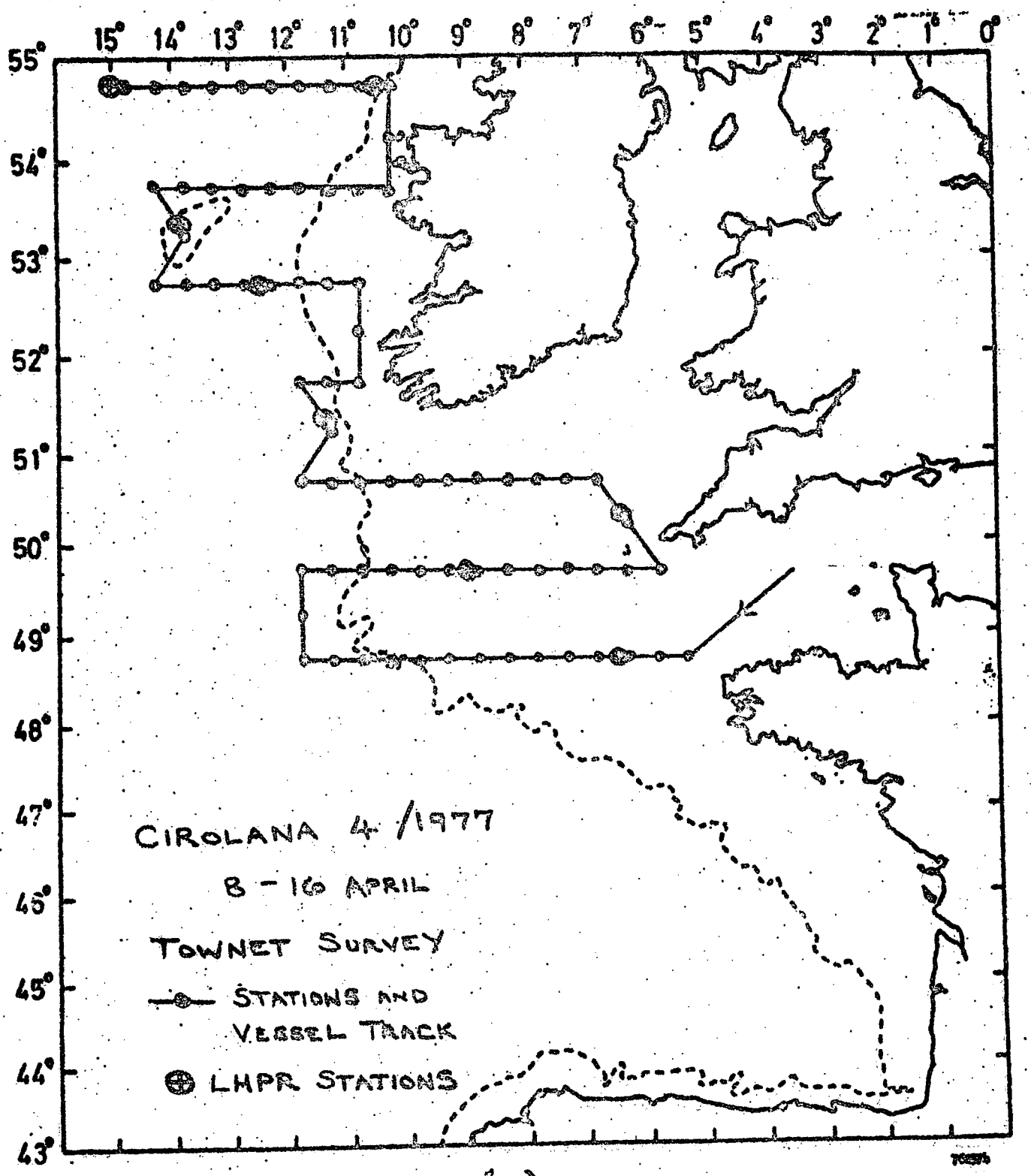
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CIROLANA 4/1977
8 - 16 APRIL
TOWNET SURVEY
STATIONS AND VESSEL TRACK
LHPR STATIONS

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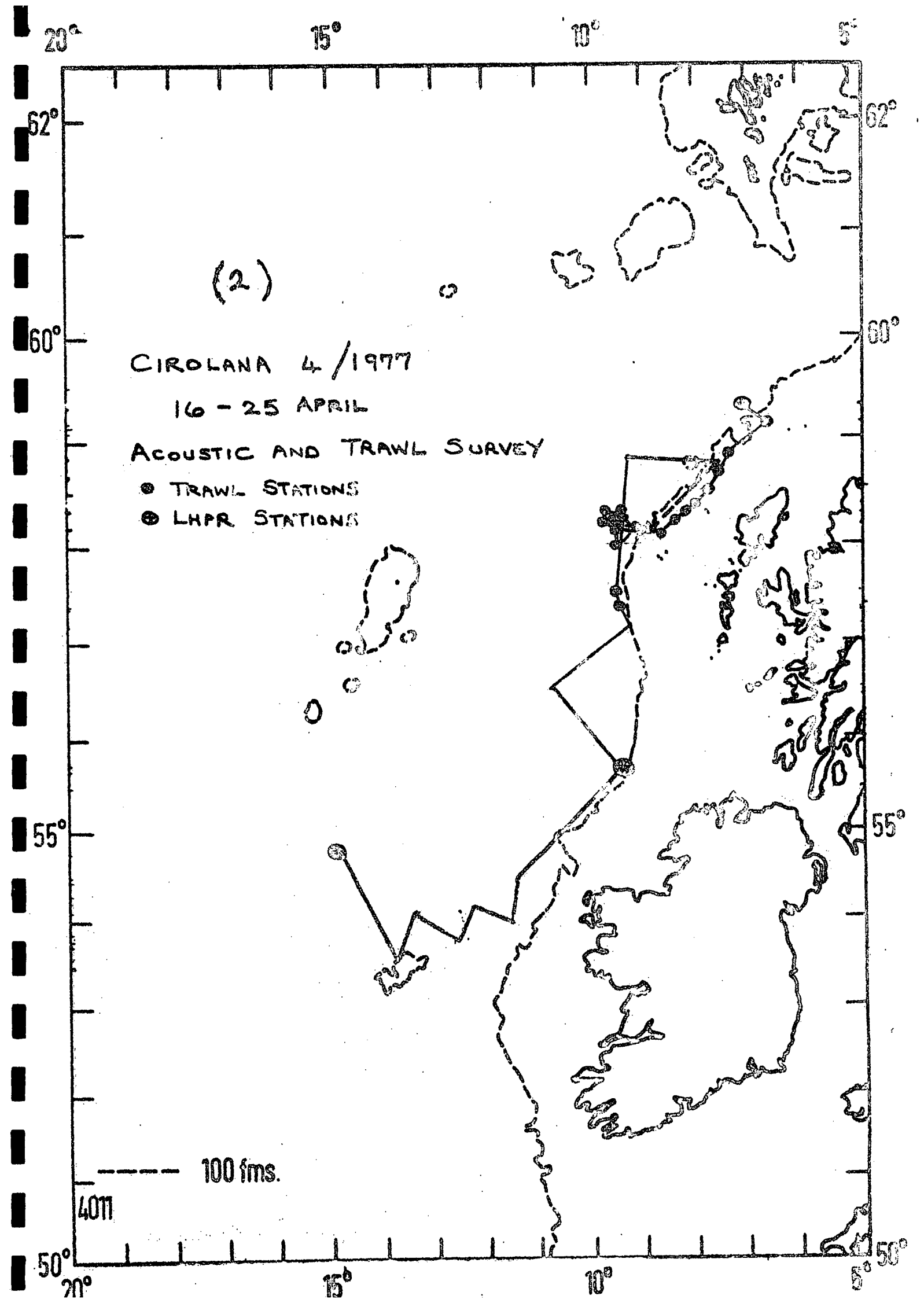
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CIROLANA 4/1977
16 - 25 APRIL
ACOUSTIC AND TRAWL SURVEY
TRAWL STATIONS
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