

R1/12 In Confidence
Not to be quoted without reference to the Laboratory

FRV "Scotia"
Cruise 7/81
REPORT
15 July - 4 August 1981

7SR81
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Objective

To investigate the migration of the west coast mackerel stock.

Narrative

"Scotia" sailed from Aberdeen at 1630 on 15 July. On the following afternoon, the ship anchored in Ronas Voe (Shetland Islands) when the acoustic instrumentation was calibrated. The acoustic survey commenced on the evening of 16 July, north-east of the Shetlands, working south-westwards along the continental shelf edge. The work continued without interruption until 22 July. "Scotia" then proceeded to Broad Bay where a second acoustic calibration was done, thence to Stornoway for the half landing, arriving there at 0730 on 23 July.

On departure from Stornoway the next day, the ship returned to the shelf edge north-west of Lewis. The southern limit of the survey area, $54^{\circ}30'N$, was reached on 29 July. On the return journey the ship followed the 200m depth contour up to the vicinity of the Shetlands. The period 31 July to 2 August was spent on a more detailed survey of the shelf edge area north and north-west of the Shetlands. On 2 August the ship went to anchor in Fetlar where a further acoustic calibration was performed. "Scotia" then returned to Aberdeen where the cruise ended at 1300 on 3 August.

Results

The survey covered an area around the 200m depth contour along the continental shelf edge between latitudes $62^{\circ}N$ and $54^{\circ}30'N$. The survey track is shown on the attached chart.

Over 350 pelagic fish-type echo traces were observed. They were found predominantly in the depth range 180-250m and in northern waters, above $59^{\circ}N$. The echo integrator was used to measure the echo energy from each shoal and thus to provide an estimate of the "acoustic density" as an aid to species identification.

Some of the shoals were identified by pelagic trawling. The catches consisted almost entirely of pearlsheds (Mauralicus muelleri). It was found that this species gave a characteristic dense echosounder mark (type A) corresponding to a high acoustic density. However, a second kind of mark (type B) was much in evidence. The latter were thin, high marks, up to 90m between top and bottom, and they indicated a lower acoustic density than type A. Attempts to sample the type B shoals by pelagic trawl were not successful. Although on two occasions a few mackerel were taken, there was no indication on the netsounder of fish entering the net nor of fish below the net. The towing speed was generally

between 4 and 5 knots and the gear appeared to be operating correctly. Thus it is inferred that the type B fish were fast swimmers of low acoustic reflectivity. Mackerel is the only shoaling species known to be in the area at the time which would fit this description. Further, the acoustic density of the type B shoals was consistent with that expected from mackerel, as indicated by the results of a previous survey (Marine Laboratory cruise report 7CR30).

Handlines were worked at 29 stations as shown on the track chart. The catches by this method were mainly mackerel, also a few squid (Ommastrephidae) and grey gurnard (Trigla gurnardus) were taken. It was not possible to correlate these captures with particular shoals. The handlines could be worked only down to 50m while the shoals occurred mostly in deeper water.

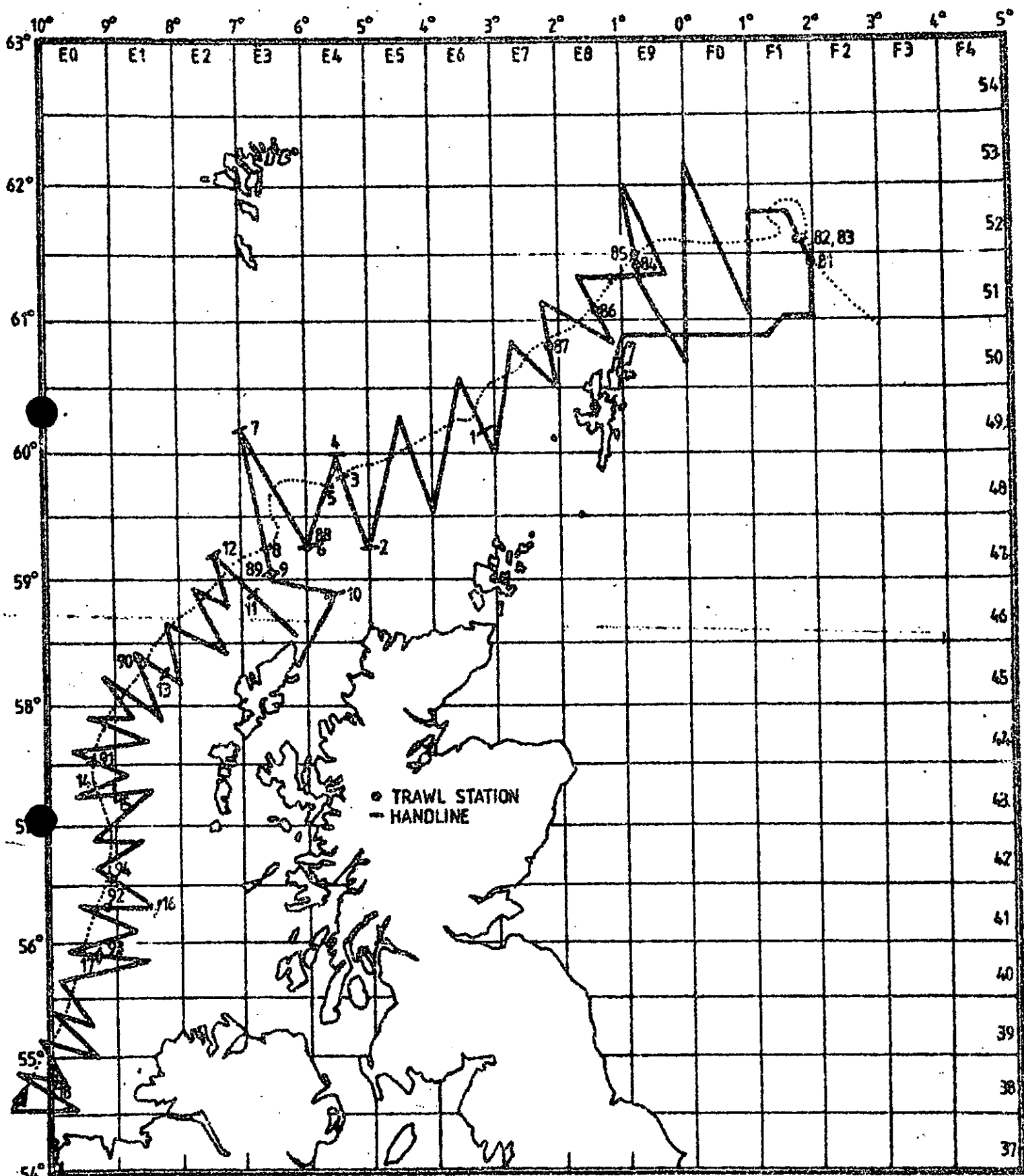
The sampled mackerel had a size range of 30 to 46cm. Fish over 12 years of age predominated with the 1975, 1976, 1978 and 1973 year classes also relatively prominent; thus the age composition was characteristic of the western mackerel stock. Feeding had been relatively heavy with Maurolicus muelleri present in several stomachs investigated.

Since many of the shoals were intermediate between types A and B, further analysis of the acoustic records is required before an estimate can be made of the quantity of mackerel present in the area surveyed.

D. N MacLennan

11 August 1981

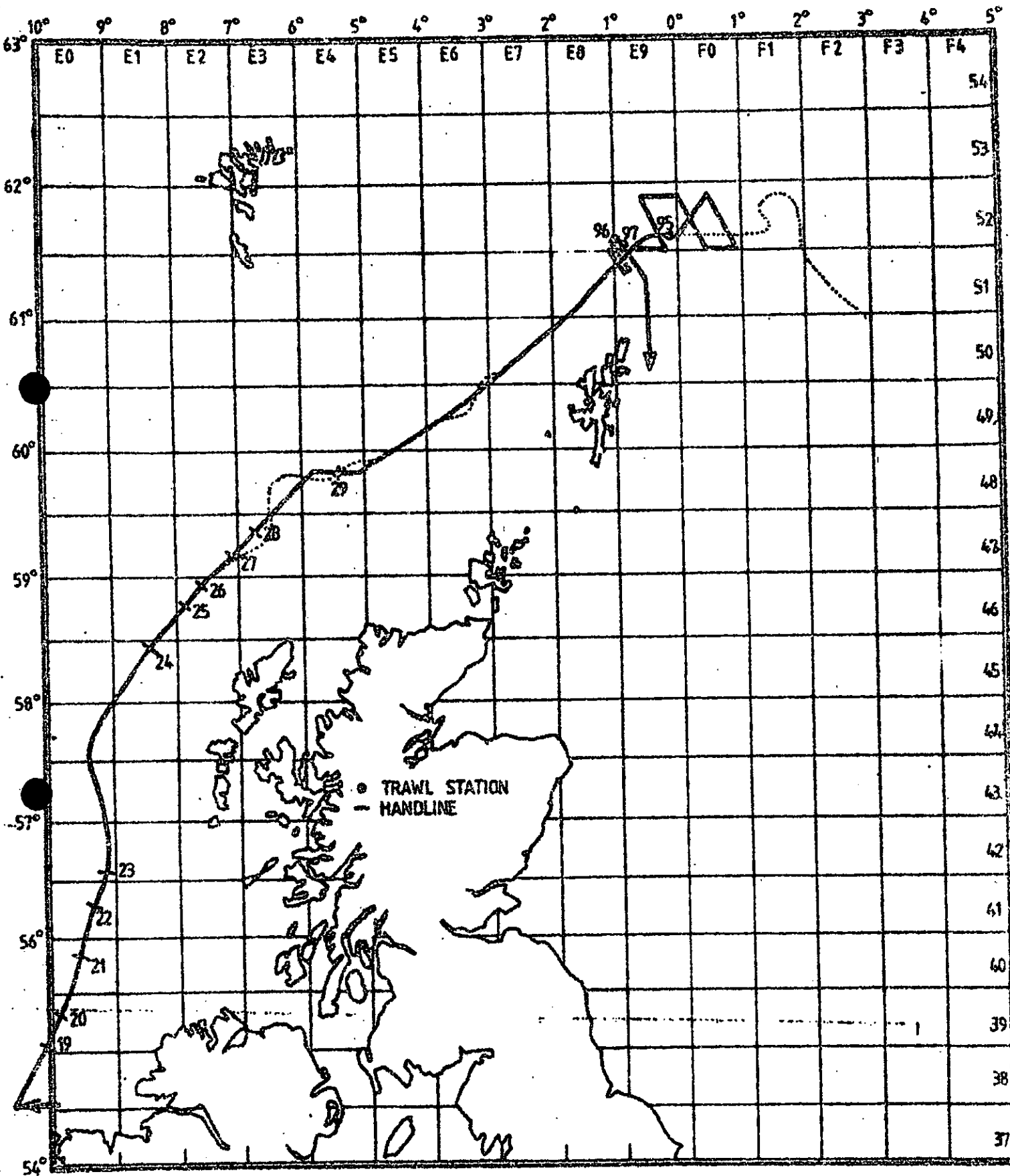
Seen in draft: J W Gillon



Scotia

15. 7. - 4. 8. 81. (part 1)

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Scotia

15. 7. - 4. 8. 81. (part 2)

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