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FRV EXPLORER

Cruise 12/80

REPORT

31 October - 19 November 1980

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OBJECTIVES

1. To carry out an echointegrator and midwater trawling survey for 0-group sprats in the western half of the central North Sea.
2. To investigate the vertical distribution of 0-group sprats at different times of day and night.
3. To investigate the use of low-light television as a means of identifying echotraces.

NARRATIVE

EXPLORER sailed from Aberdeen at 1100 on 31 October and headed south in severe weather to anchor in St Andrew's Bay for repairs to a generator. Because of strong southerly winds, work during the next two days was confined to the Firth of Forth. By 3 November the weather had ameliorated and trawl stations and an echointegrator survey were carried out in the approaches to the Forth and off the north-east coast of England. Trawling became impossible on 5 November and in worsening weather the ship proceeded to the Firth of Forth anchoring in Largo Bay for the night of 6 November. A passage was then made to the Forties Field and on 8 November, two stations were completed before the weather again deteriorated. EXPLORER spent 9 November trawling at different depths in an area of sprat shoals north of Bell Rock, and then proceeded to Aberdeen for the half-landing docking at 1100 on 10 November.

EXPLORER sailed from Aberdeen at 1330 on 11 November and in a gale made a direct passage to the Moray Firth. Echointegration and trawling was carried out in this area until 14 November. The following day work was confined to the Scottish east coast. Two offshore stations were completed on 16 November, but in an increasing south-west wind, a passage was made to the Tyne to complete stations omitted in the first half of the cruise. Finally, two further hauls were carried out off Montrose on 18 November and EXPLORER docked in Aberdeen at 2300.

On 19 November, scientific staff were exchanged and a team from BBC's "Tomorrow's World" programme joined the ship for the day to take film of trawling and TV operations close to Aberdeen. The ship redocked in Aberdeen the same evening at 1700.

1) Echointegration and trawling survey

Throughout the cruise trawling was limited to the hours from 0800-2000 and echointegration was carried out between trawl stations and at night. The track chart is shown on the attached figures. Intense echotraces were not found in any areas, but relatively diffuse traces probably attributable to clupeids and small whiting, were found off the east coast of Scotland, notably from the Bell Rock-Montrose and in the Firth of Forth. There was no commercial sprat fishery in operation in any of the areas surveyed.

A total of 36 hauls were carried out with an International Young Gadoid pelagic trawl (PT 154) fitted with an 11mm knotless mesh codend. Hauls were of one hour's duration, divided between 20 minutes close to the sea bed, 20 minutes in the middle of the water column and 20 minutes as near the surface as practicable (usually the headline depth was about 15m). Small catches of clupeids were made in 28 hauls, the largest being $3\frac{1}{2}$ baskets in one haul off Montrose. Sprats predominated numerically in most hauls, but 0-group herring were widespread, and estimated proportions of the two species by weight indicated that herring, on average, predominated in the Moray Firth (59% herring) and off the north-east coast of England (71% herring), while sprats predominated in the Firth of Forth (44% herring) and off the east coast of Scotland (23% herring). Catches in numbers of the two species are shown on an attached chart.

The sprats caught ranged in length from 2cm metamorphosing larvae to 14.5cm. In almost all areas, except those offshore, 0-group sprats predominated. In the Firth of Forth the mean length was 3.9-6.9cm and in the Moray Firth 7.3-10.1cm. Two samples off north-east England had mean lengths of 6.2-6.4cm and two north-west of the Dogger Bank 3.4-3.6cm.

The herring caught were predominantly 0-group ranging in length from 7.5 to approximately 15cm, with a mean of around 11cm in all areas. Only small numbers of 1-group were caught in several widely separated areas. Samples of small herring were returned to the laboratory for examination of pyloric caeca.

Several other species of fish were caught, but the only one in any numbers and with any regularity was whiting. Inshore stations contained two modal size-groups, one with a mode of 10-13cm in length, the other 20-23cm, but offshore off north-east England, a much smaller size-group was found ranging in length from 2-7cm with a mode between 3 and 6cm.

Records of coelenterates were obtained for Mr S Hay. In one haul offshore off north-east England ca 20 litres of salps were caught.

2) Information on the depth distribution of sprats was obtained from echosounder traces. In addition, in a trawl haul off the east coast on 9 November, it was noticed that whereas small 0-group sprats (modal length 4cm) were still alive on hauling, larger sprats (6.5cm and above) were dead. Since the last part of the haul was near the surface, this suggested that small sprats were caught in the upper part of the water column and larger ones at a greater depth. To investigate this further, two short hauls were made in the same area. One near the surface caught only small 0-group sprats (2.5-5cm), while one near the sea bed caught a mixture of sizes (3.5-12cm) most being in the range 4.5-7cm. Small herring were caught only in the haul near the bottom.

3) The TV camera was lowered while the ship was stationary on four occasions. In the inner Moray Firth on 12 and 13 November no fish were observed in mid-water, but large numbers of Nephrops burrows, some with the animals on the mud nearby, were seen together with small bottom fish. Despite the presence of echotraces near the bottom in Nairn Bay, no fish were seen in the TV camera. In some places, parallel furrows were observed on the sea bed, probably indicating the passage of a trawl.

In the Firth of Forth on 17 November in two areas of midwater echotraces, occasional glimpses of clupeids were obtained and in one case the camera passed through a small disorientated shoal while being lowered. Identification to species was not possible from the TV observations, but still photographs taken

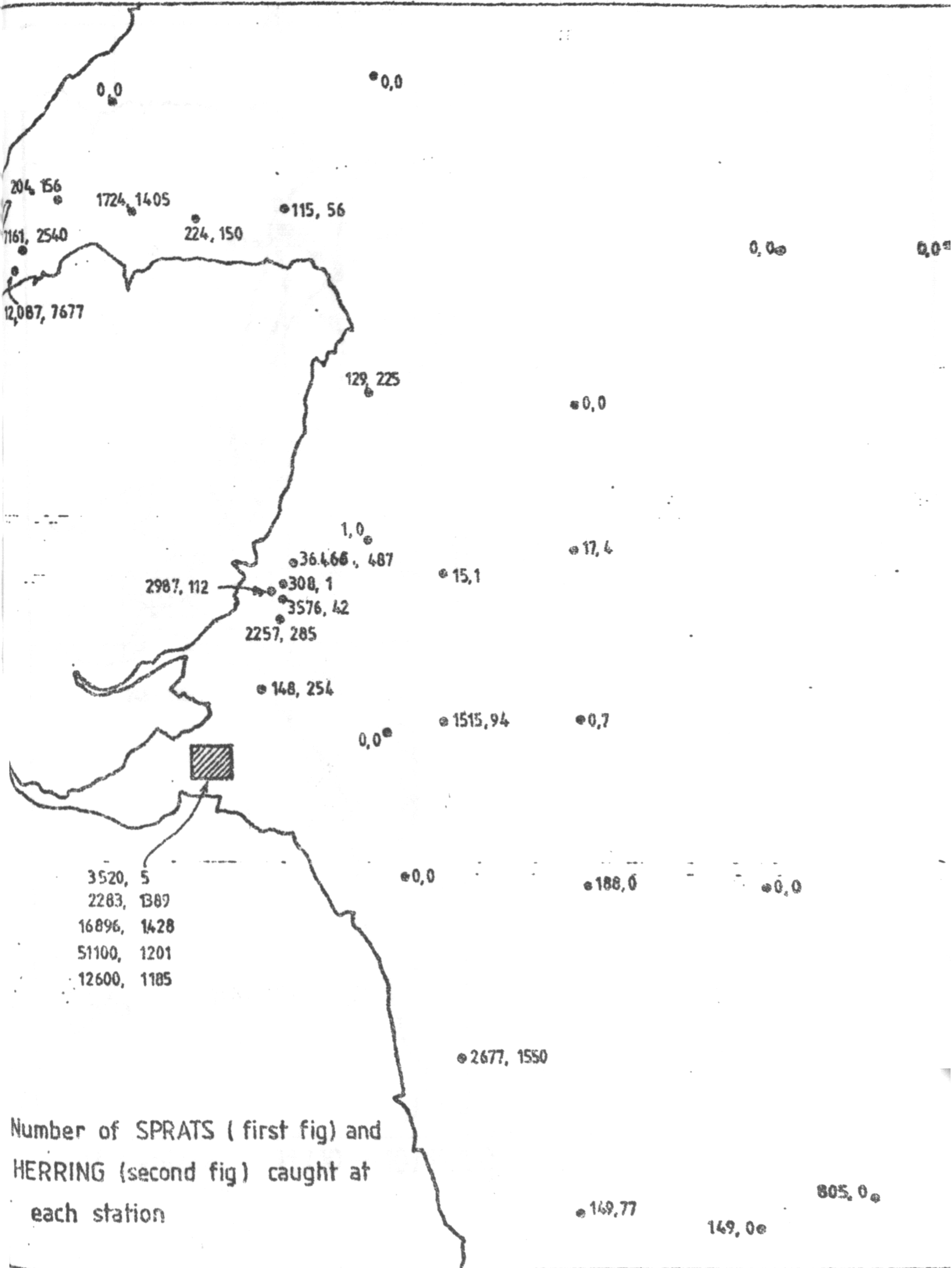
by flash with a Hasseblad camera were obtained for examination in the laboratory. Overall, it appeared not to be possible to lower the camera into echotraces with any reliability because of the drift of the ship.

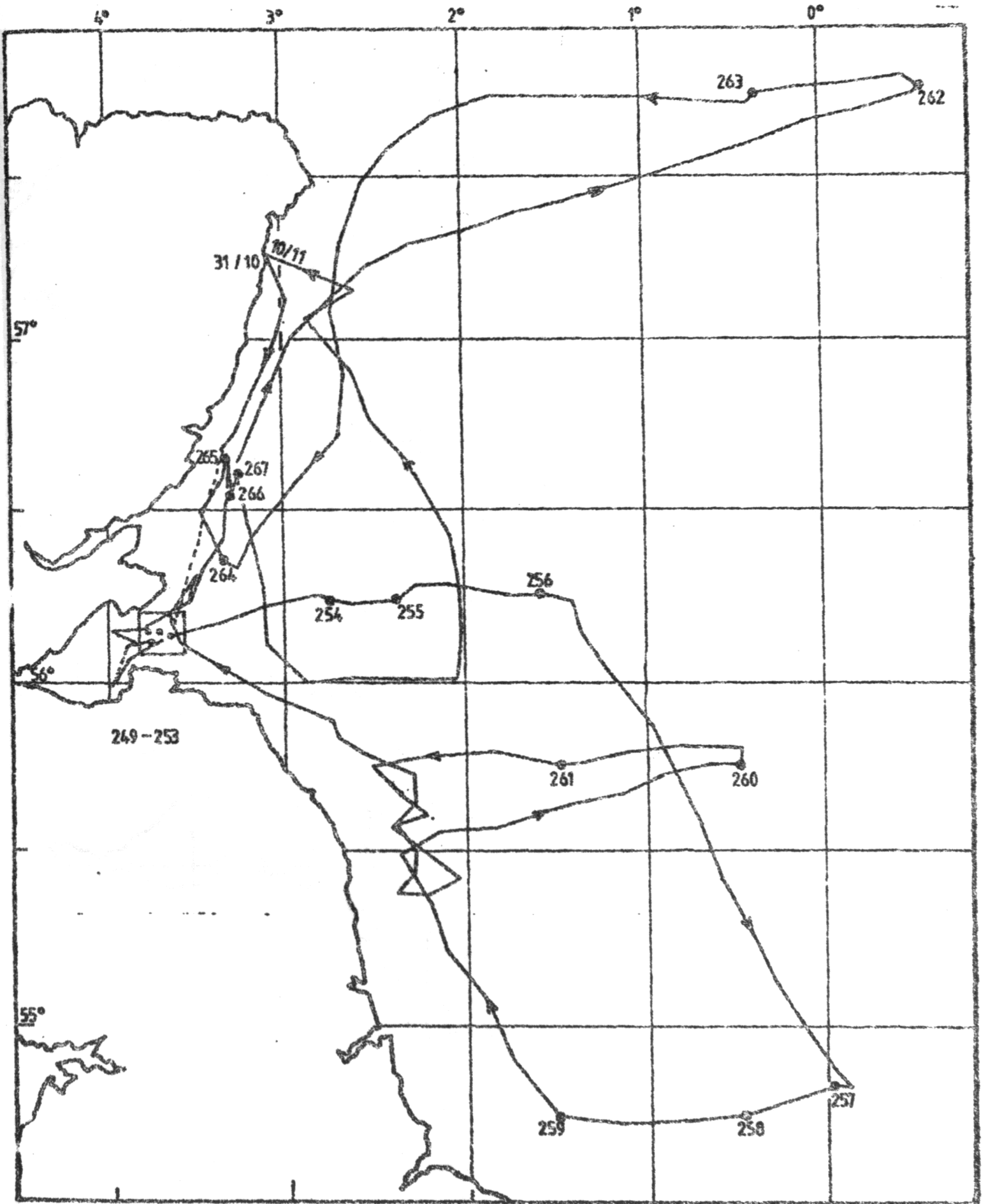
4) Seabird observations were made by Mr O'Neil of the Nature Conservancy Council on the first half of the cruise.

5) Daily communication was made with two Norwegian Research vessels also taking part in a sprat survey.

R S Bailey
6 February 1981

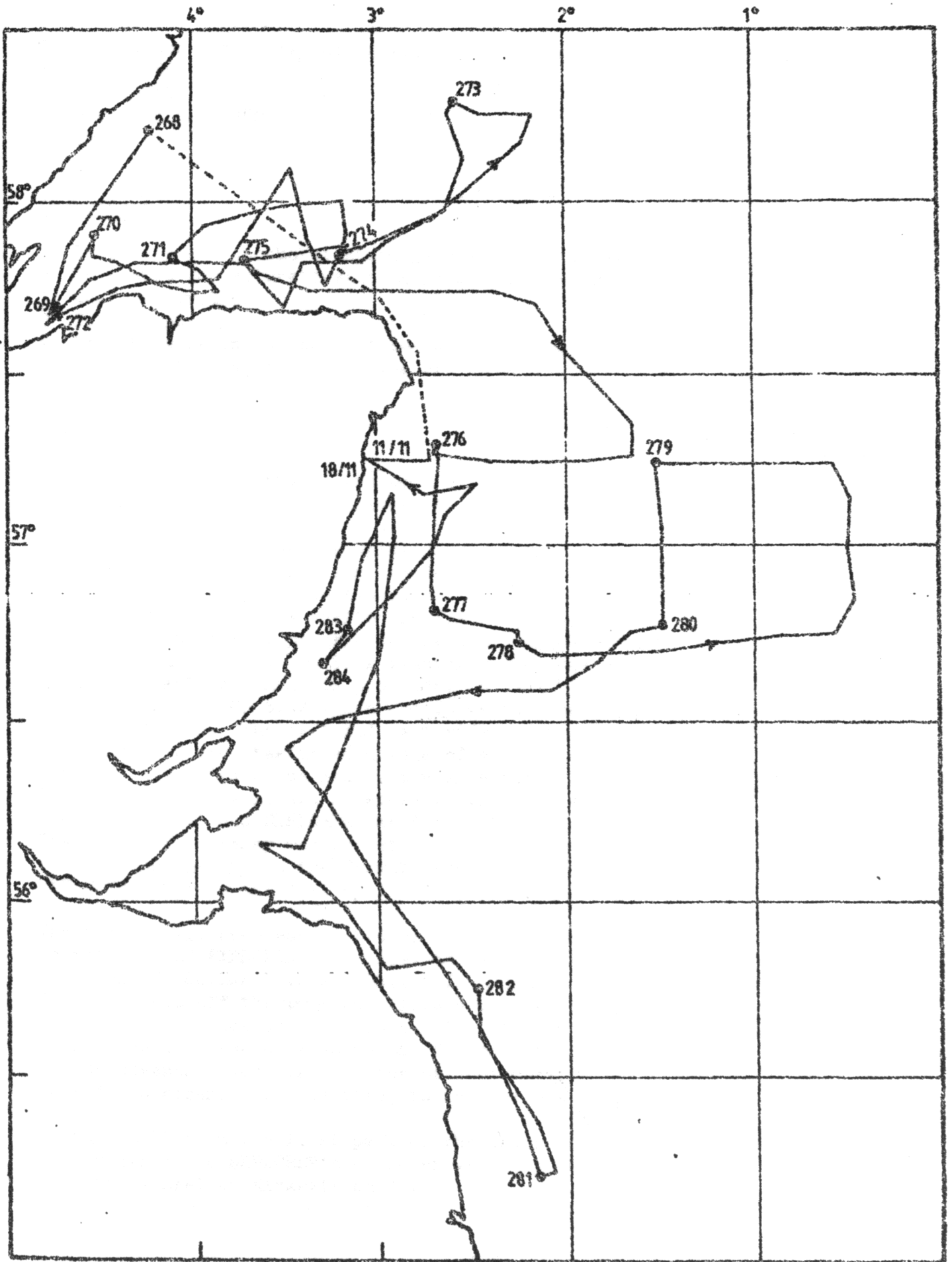
Seen in draft: G H Henderson - Commanding Officer





FRV Explorer 31/10 - 10/11/80

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FRV Explorer 11/11 — 18/11/80

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