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## REPORT

### *Clupea* Cruise (0193 Part II)

#### Personnel

D C Moore	SSO (OIC 18-28 January )
S Greenstreet	HSO (OIC 13-18, 28-30 January)
S Hay	HSO (13-16 January)
J Hunter	PTO

#### Objectives

1. To conduct fluorometric measurements in the surface waters around the area of the Shetlands impacted by the *Braer* oil spill.
2. To collect water, particulate and sediment samples for hydrocarbon analysis.
3. To undertake sea-bird counts
4. To conduct a mark-recapture experiment using seabird carcasses.

#### Narrative

The *Clupea* sailed from Aberdeen at 1100 on 13 January following three days of unfavourable weather. She made passage as far as North Orkney before being forced back to shelter around midnight of the same day. During this shelter period the *Clupea* conducted trials of the fluorometer and collected clean sea water for use in particulate sampling in the area of interest. Bad weather continued, forcing *Clupea* to shelter in Inganess Bay, until Saturday, 23 January when she sailed to Kirkwall to allow S Hay to transfer to Shetland to join the *Michael Sars*. *Clupea* left Kirkwall on Monday 18 January, arriving at Lerwick at 1930 where D C Moore joined.

On Tuesday, 19 January, work commenced on the east coast using the Aquatracka fluorometer (Fig. 1) and collecting water samples for hydrocarbon and particulate analysis (Fig. 2). The water samples were transferred to Scalloway in the evening. The following day the ship sailed but problems with the Decca navigator forced a return to Lerwick to await service. Severe weather then prevented sailing until Friday 22 January. During this period of inclement weather scientific staff were redeployed to various tasks at the Scalloway Laboratory.

*Clupea* finally sailed from Lerwick at 1300 and occupied 42 stations associated with sandeel spawning grounds (Fig. 3) and a 2 nm grid on the east coast (Fig. 4).

The ship then made passage to the west side of the Shetlands following a period of dodging, awaiting a safe passage through the Sumburgh Röst. This was finally achieved during the evening of 23 January and *Clupea* then continued undertaking fluorometric

measurements until blizzard conditions forced a stop to the work at about 2000. Work recommenced at first light the following morning and *Clupea* docked in Scalloway on the evening of 24 January.

Work was again disrupted by severe weather conditions during 25 January, staff again being deployed to the Scalloway Laboratory. When conditions improved *Clupea* sailed and conducted continuous fluorometric surveys within and beyond the FEPA exclusion box in an effort to assess the areal spread of the oil. On completion of this, investigations were extended into the voes surrounding the area of apparent impact with Selivoe, Sand Voe, Skelda Voe, Weisdale Voe, Sandsound Voe, Whiteness Voe and Clift Sound being visited. Each was sampled by fluorometer and grab (see Figs 1 and 3).

D C Moore disembarked on the morning of 28 January to return to Aberdeen and the *Clupea* commenced grab operations on the 2 nm grid covering the west coast, concentrating on the close inshore stations which would be problematic for the *Scotia*. A total of 25 stations (Fig. 5) were occupied before prevailing weather conditions deteriorated to the point where grabbing became impossible. *Clupea* then made passage for Fraserburgh.

## Results

The output data from the fluorometer were transferred to Aberdeen where they were used to create contour plots of the oil distribution. All samples of water for hydrocarbon analysis were transferred to the Scalloway Laboratory where they were extracted and primarily screened for total oil content. The particulate and sediment samples which were collected were returned to Aberdeen for analysis. The resulting data will be published in the Shetland Monitoring Programme Bulletins as they become available.

Inclement weather conditions prevented sea-bird counts from being undertaken. Due to the unavailability of carcasses the mark and recapture experiment was not conducted.

D C Moore

4 February 1993

Fig 1

CRUISE TRACK OF FRV CLUPEA

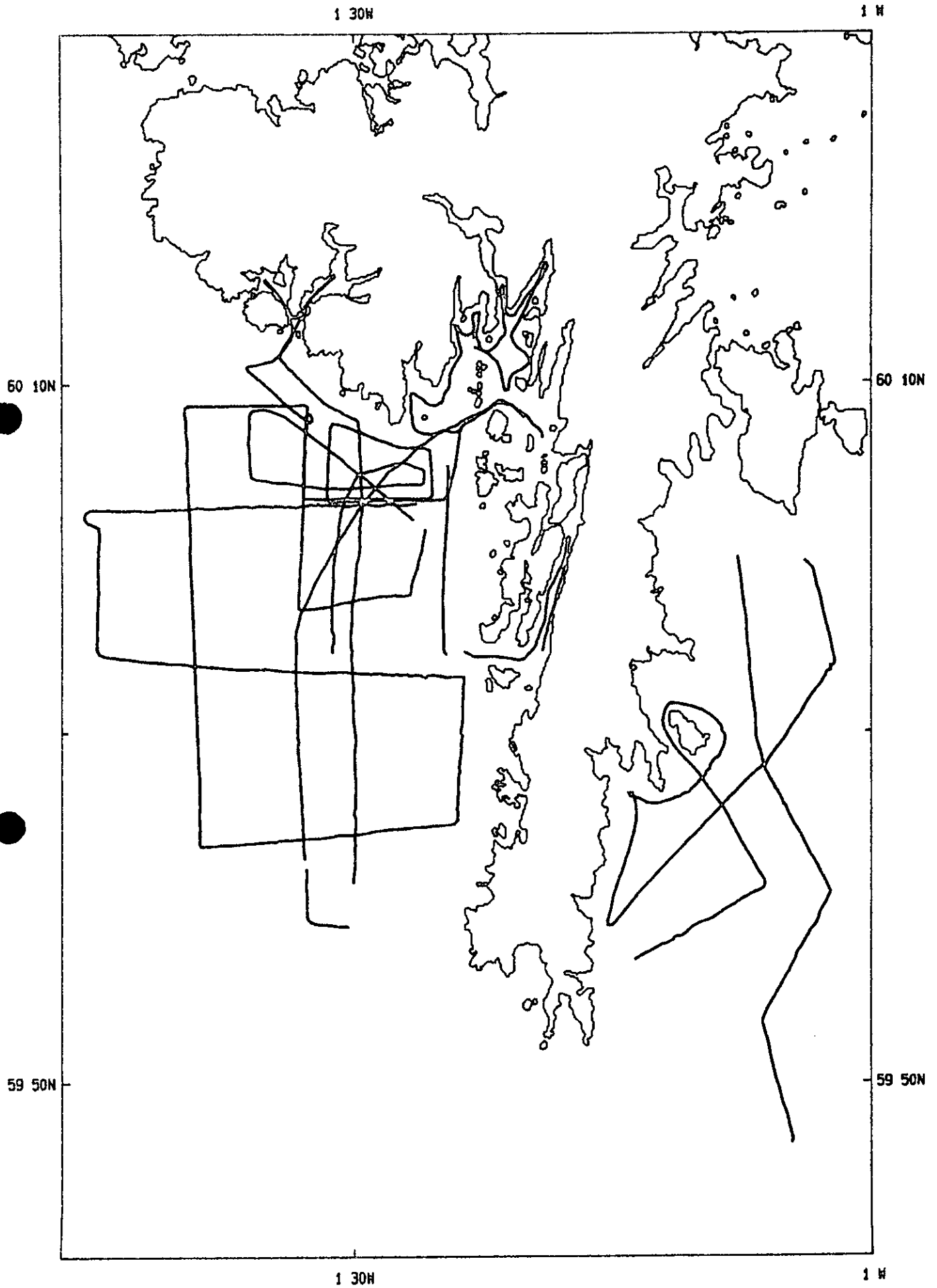


Fig 2

Clupea - Suspended Particulate sampling Points.

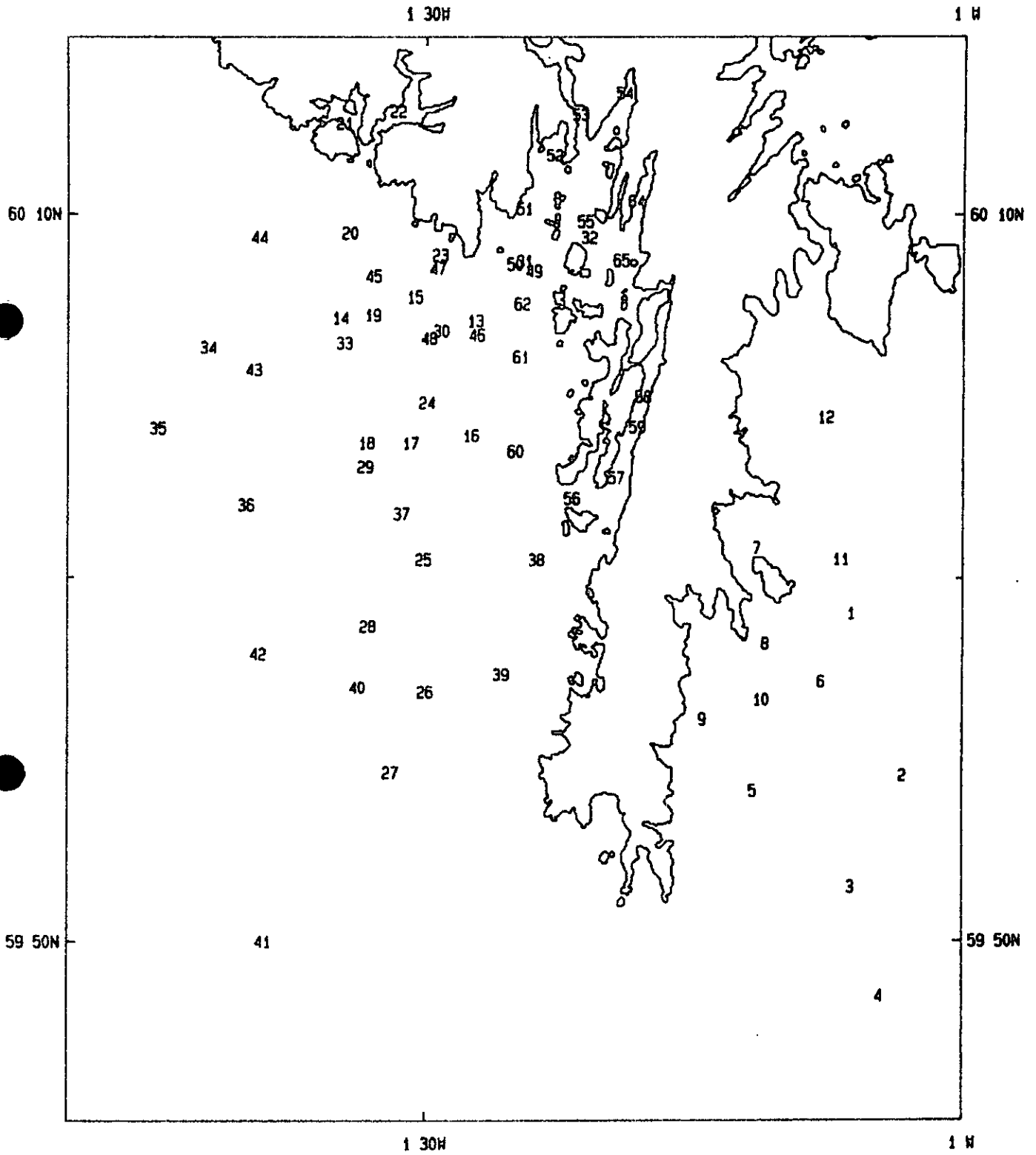


Fig 3  
Clupea - Discrete samples from Sandeel Grounds and West Coast Voes

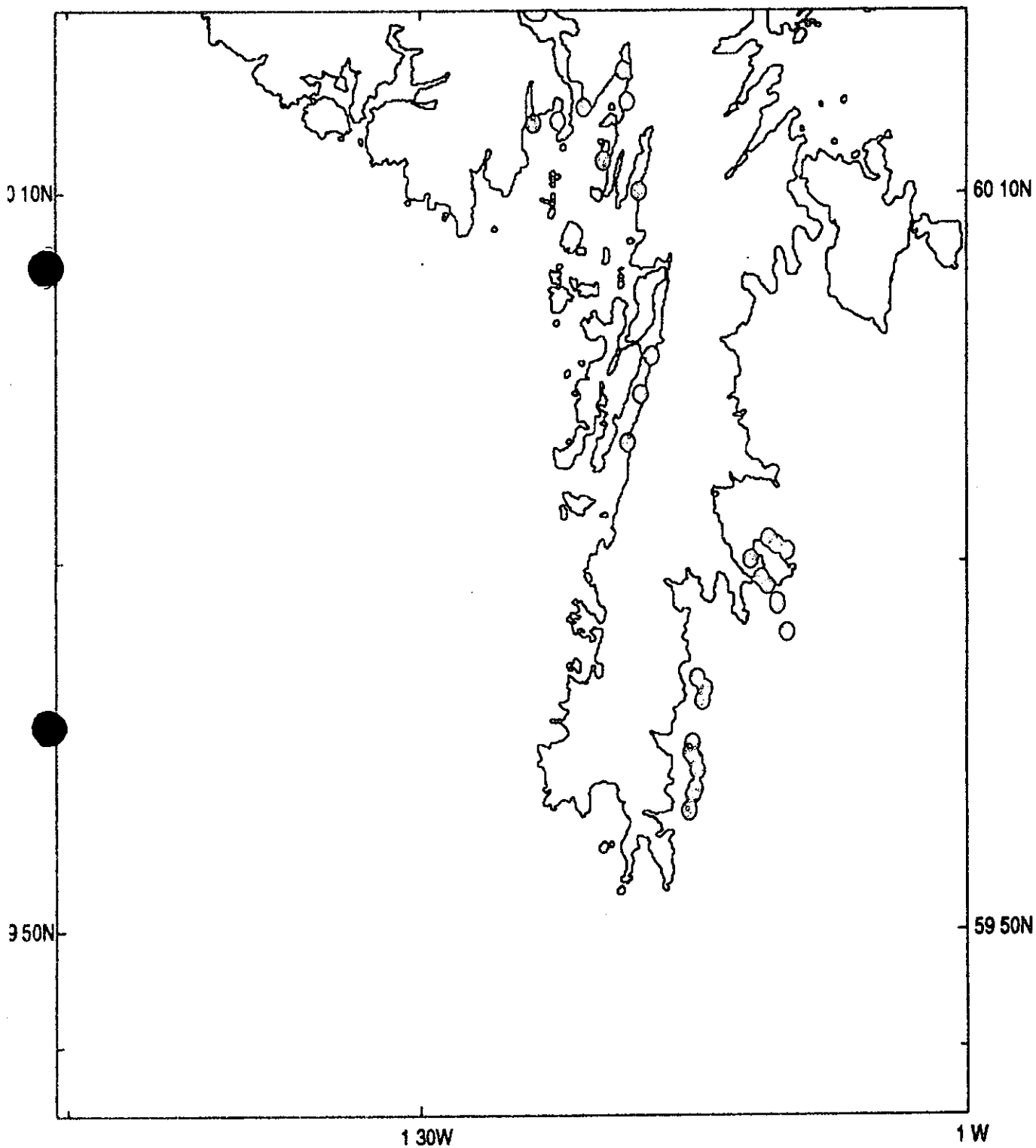


Fig 4<sup>a</sup>

Clupea East Coast Sediment Sampling Stations

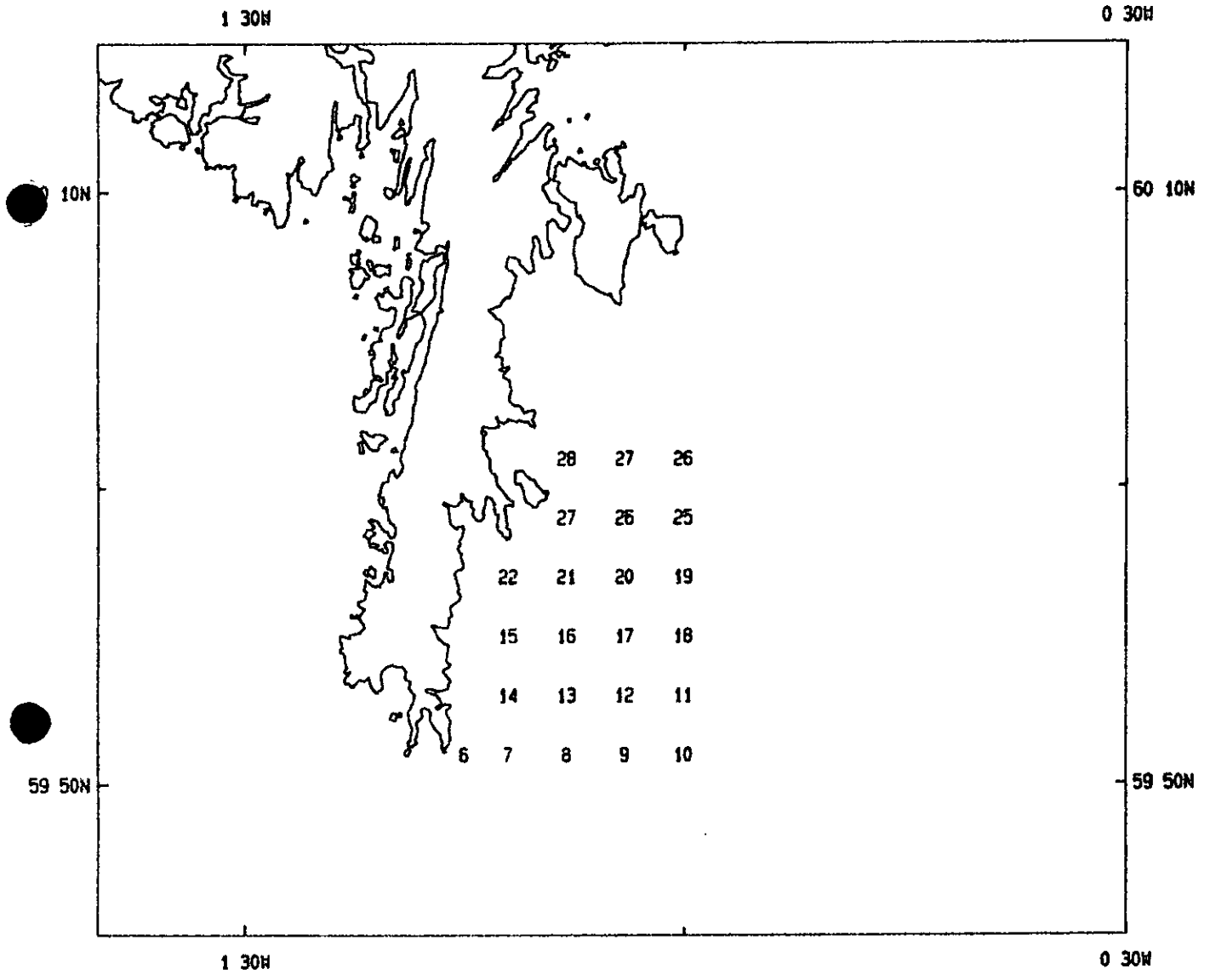


Fig 5

Clupea West Coast Sediment Sampling Stations

