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FRV *CLUPEA*

Cruise 0196C

REPORT

5-25 January 1996

Personnel

SPR Greenstreet	HSO (in charge)
F Armstrong	SO (first part of cruise)
IM Gibb	SO
J MacMillan	ASO
M Harding	Marine Laboratory contract worker (second part of cruise)

Objectives

To carry out an echo-integrator survey to determine the biomass and distribution of pelagic fish in the Moray Firth and to determine fish species and size composition through trawl sampling. To assess the abundance and distribution of predatory fish by demersal trawl sampling and to collect stomach samples for dietary and food consumption analysis. To determine the numbers and distribution of mammalian and avian predators using transect census methods and to collect observation data regarding diet. To determine spatial variation in water temperature and salinity depth profiles using CTD recorders and to map seabed sediment type using RoxAnn and grab sampling.

Out-turn days per project: 10.5 days GAC1; 10.5 days HAB1.

Narrative

The scientific equipment was loaded onto *Clupea* on 3 and 4 January. Scientific staff joined the ship on the morning of 5 January at Fraserburgh. The ship sailed at 1300 hours. Acoustic survey work was carried out during daylight hours (approximately between 0830 and 1630 hours) starting on the morning of 6 January. Bad weather prevented any work on 7 January and *Clupea* tied up in Invergordon for shelter. Acoustic survey work restarted on 8 January and was completed by midday on 18 January. Concentrations of pelagic fish were sampled using an International Young Gadoid Pelagic trawl (PT154) with 6 mm mesh size cod-end. Otolith samples were collected from herring and sprats and fish were weighed to determine length weight relationships from each haul. The acoustic survey track and pelagic fishing locations are shown in Figure 1.

While *Clupea* was carrying out acoustic survey work the density of seabirds, seals and cetaceans was assessed using standard survey methods. In addition to these formal surveys, all casual sightings of seals and cetaceans were noted. Observations of seabirds carrying prey in their bills were recorded to provide dietary information.

Hydrographic sampling was carried out throughout the day on 14 and 17 January, during the afternoons of 13 and 15 January, and during the morning and late afternoon of 16 January. A total of 81 stations were sampled (Fig. 2).

During the evening of 18 January *Clupea* steamed into Inverness for the half landing. On the morning of 19 January the pelagic fishing gear was exchanged for demersal gear, a Jackson Rockhopper trawl with 10 mm mesh size cod-end.

Clupea left Inverness on the morning of 20 January to carry out the demersal fishing and sediment grab sampling programmes. However, continuous strong south-easterly winds throughout the remainder of the cruise prevented fishing north of latitude 58°N and east of 3°W, severely curtailing both intended programmes. Only nine of the planned 16 fishing stations and 20 of the planned 32 grab locations were sampled; their positions are shown in Figures 3 and 4. Stomach samples were collected for dietary analysis from whiting, haddock, cod and saithe. Samples of the common species were retained for fatty acid analysis by the University of Aberdeen.

Clupea returned to Fraserburgh on 24 January. The scientific equipment was off loaded and scientific staff left the ship on the morning of 25 January.

S P R Greenstreet
7 May 1996

Seen in draft: A Simpson

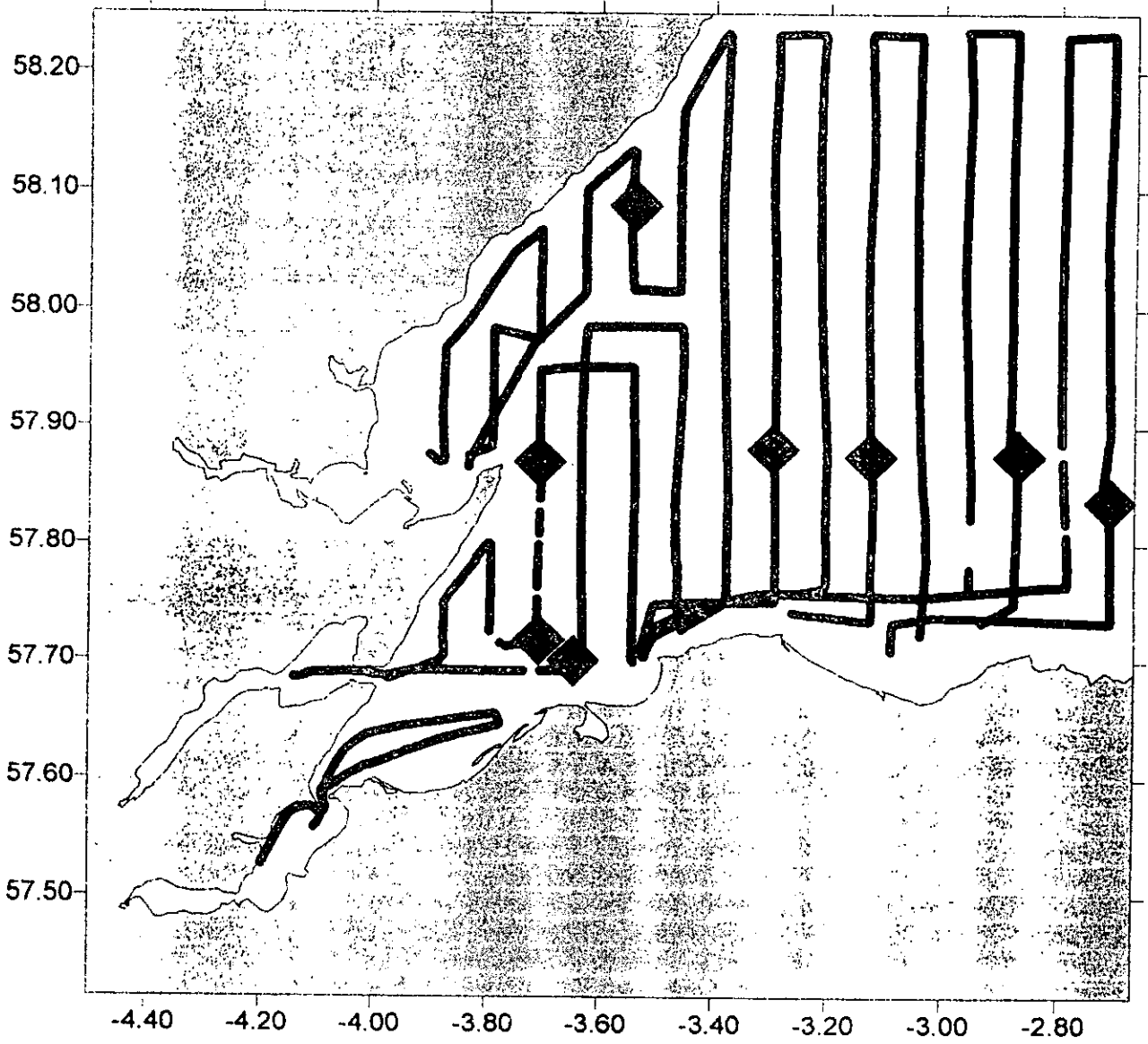


Figure 1. Acoustic cruise track and pelagic fishing locations.

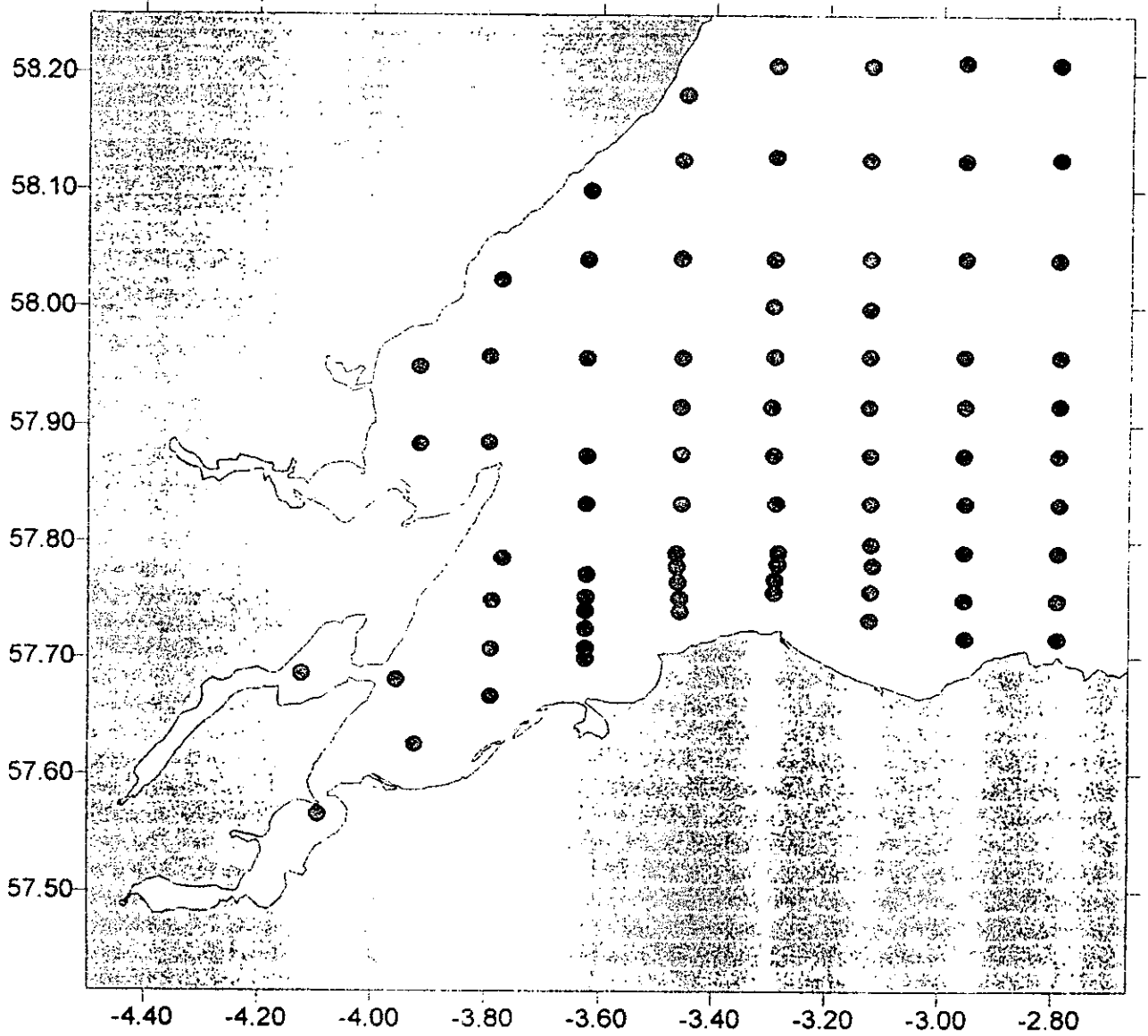


Figure 2. Hydrographic sampling locations.

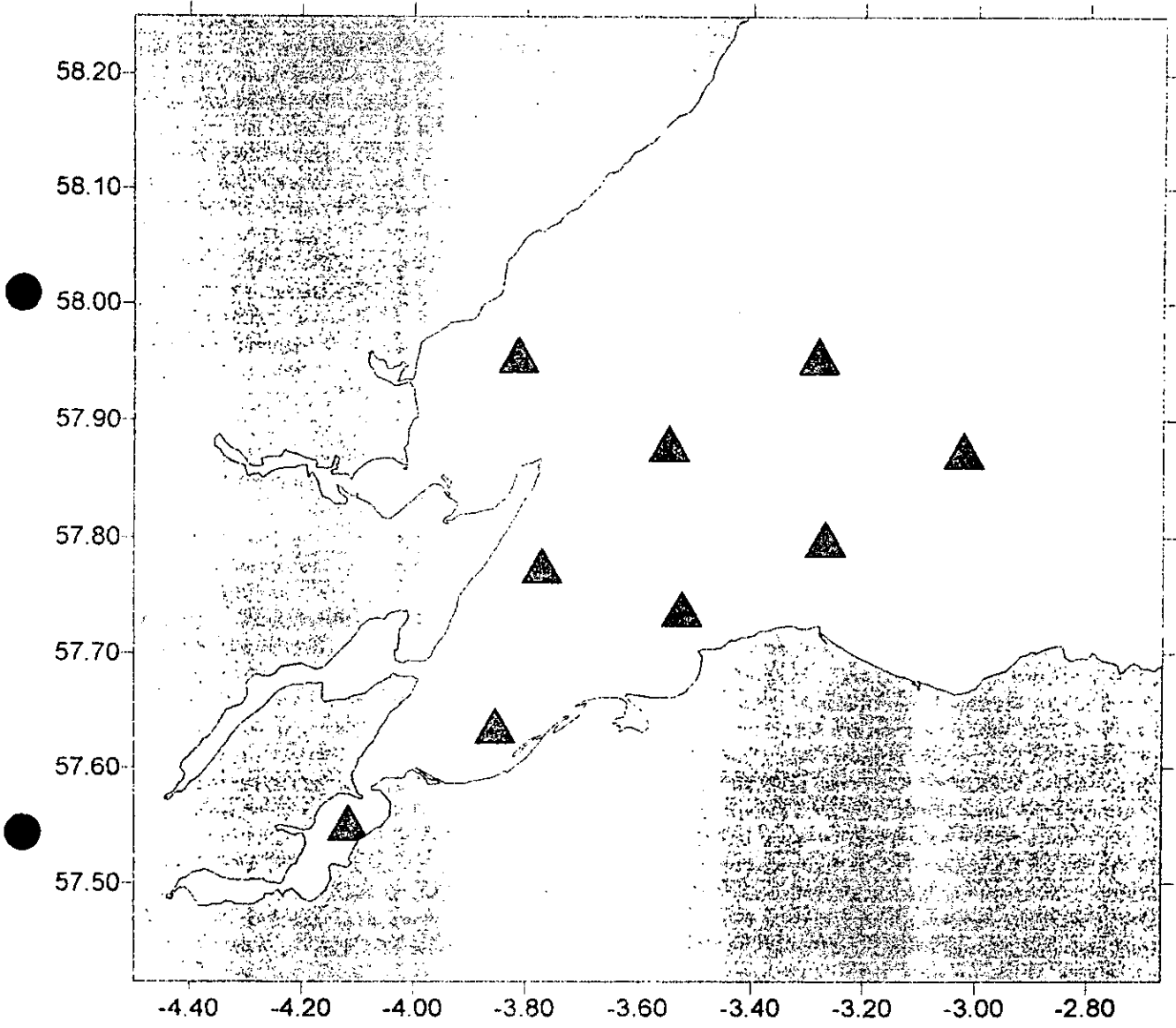


Figure 3. Demersal fishing locations.

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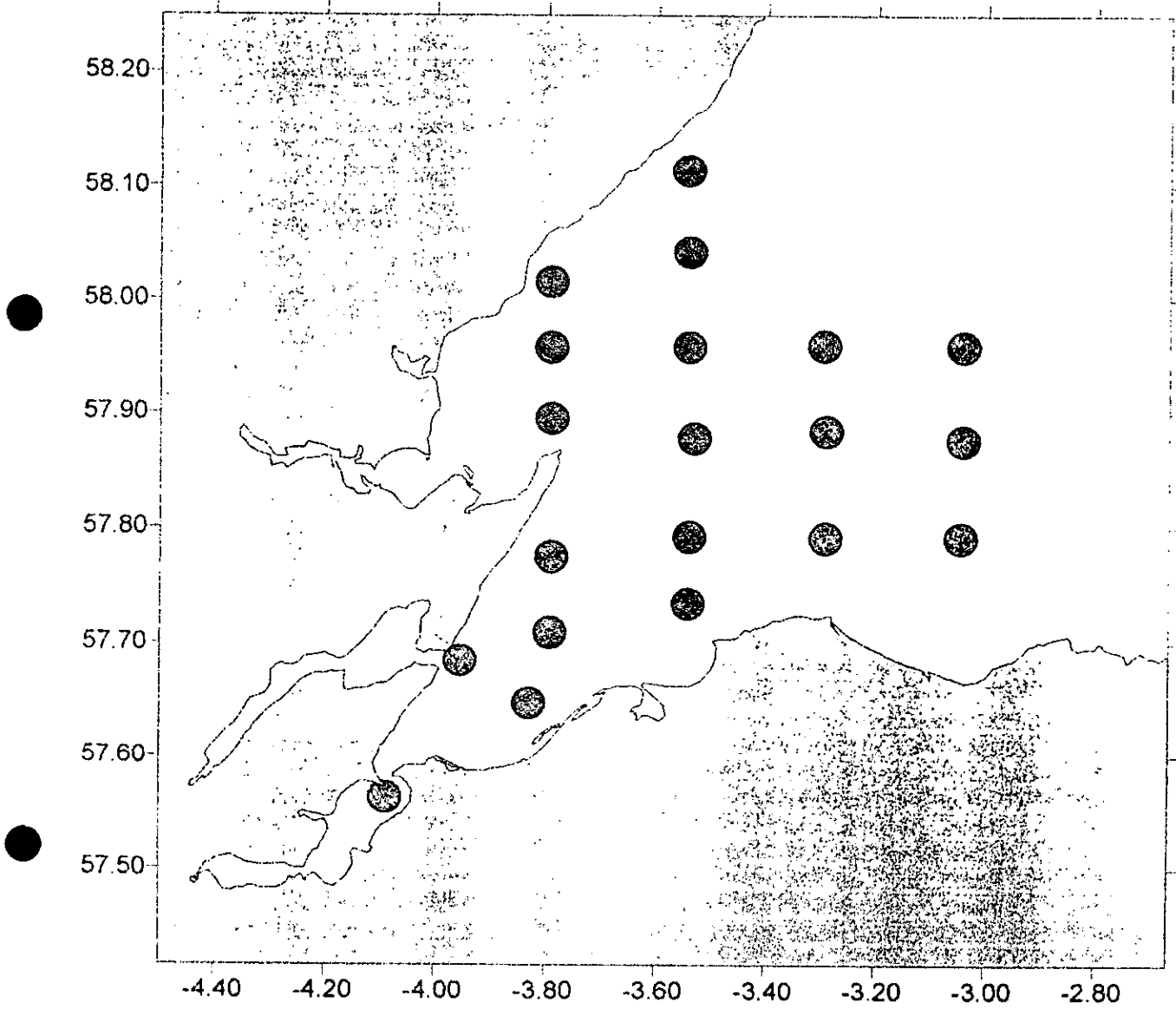


Figure 4. Sediment grab sampling locations.