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FRV *CLUPEA*

Cruise 1495C

REPORT

29 August - 18 September 1995

Personnel

S P R Greenstreet	HSO (In charge)
F Armstrong	SO (first part of cruise)
I M Gibb	SO
J MacMillan	ASO
M A Bell	SO (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 reverser bottle sampling. To determine the abundance distribution of phytoplankton and zooplankton using reverser bottle and GULF III sampling. 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 23 August. Scientific staff joined the ship on the morning of 29 August at Fraserburgh. The ship sailed during the afternoon and made for sheltered water near Helmsdale where a calibration of the acoustic integrator equipment was attempted. Acoustic survey work started on the morning of 30 August and continued during the mornings and early afternoons (approximately between 0600 and 1400) when sandeels were likely to be most active in the water column. 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, sprats and sandeels 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 during the afternoons after acoustic survey work was stopped. A total of 46 stations were sampled using CTD, reverser bottles and GULF III (Fig. 2). Water samples were collected at each station for Stable Isotope analysis by the University of Aberdeen.

Acoustic survey, hydrographic sampling, and seabird and marine mammal survey work was completed by 1400 on 9 September and *Clupea* sailed into Inverness for the half-landing. On the morning of 11 September the pelagic fishing gear was exchanged for demersal gear, a Jackson Rockhopper trawl (BT158) with 10 mm mesh size cod-end. A problem was detected with the demersal gear and the time required to sort this out prevented *Clupea* sailing on the afternoon tide. Instead *Clupea* left Inverness at midnight and anchored in the Inverness Firth ready to continue work early in the morning of 12 September.

Between 12 and 17 September demersal fishing survey and sediment grab sampling programmes were implemented. In all 22 fishing stations and 33 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 all the common fish species were retained for fatty acid analysis by the University of Aberdeen.

Clupea returned to Fraserburgh on 17 September. The scientific equipment was off-loaded and scientific staff left the ship on the morning of 18 September.

S P R Greenstreet
2 May 1996

Seen in draft: A Simpson

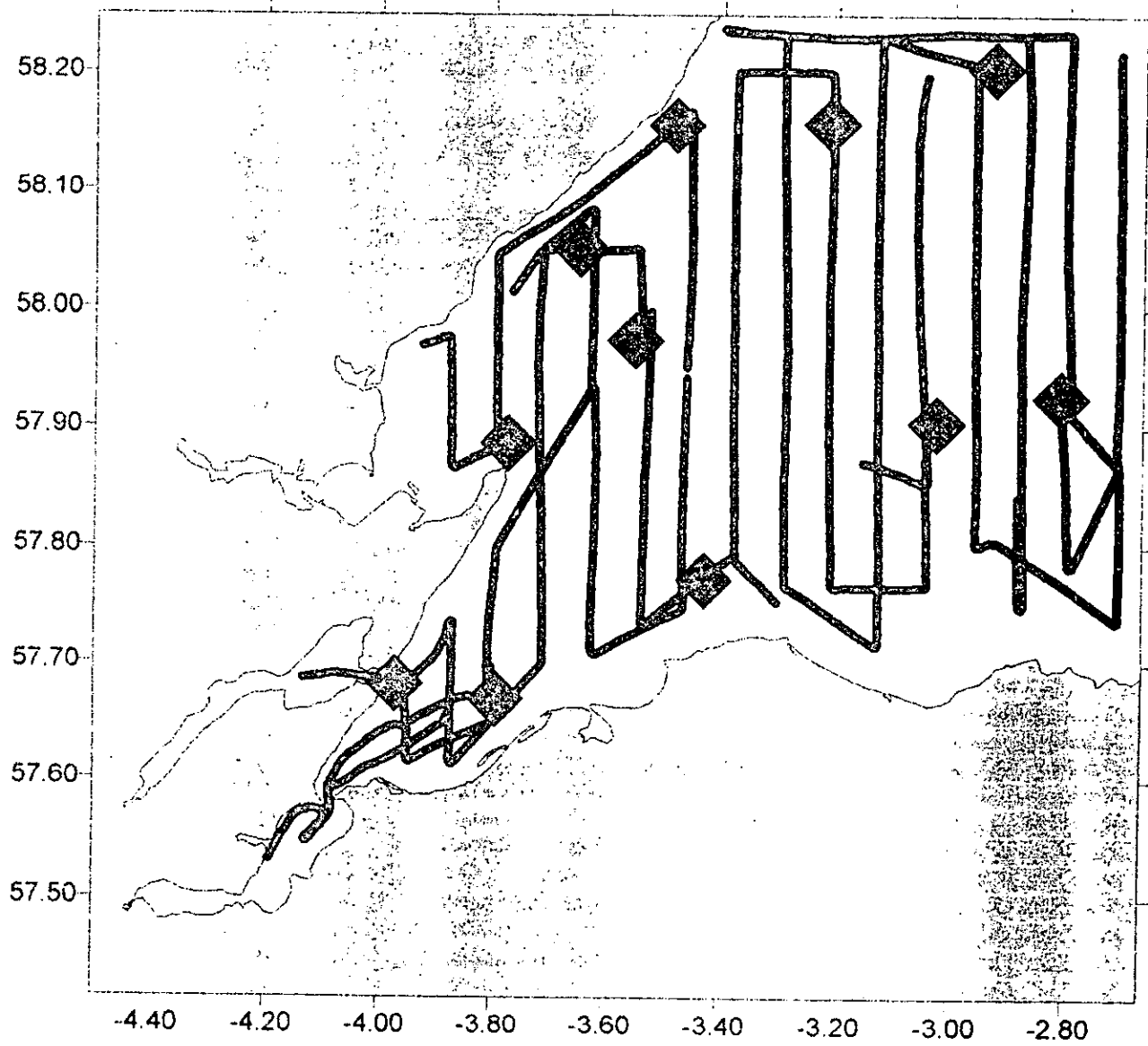


Figure 1. Acoustic cruise track and pelagic fishing locations.

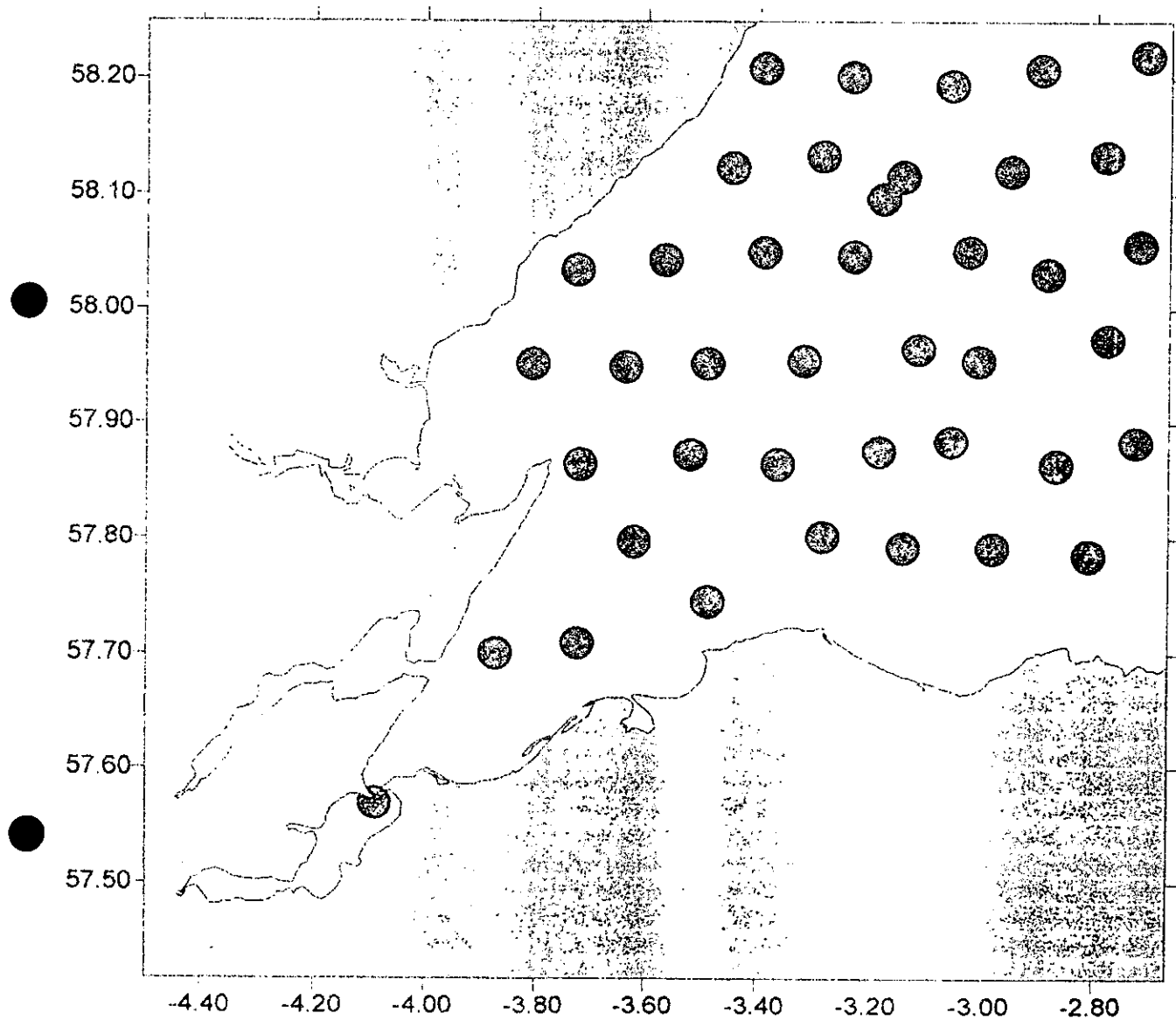


Figure 2. Hydrographic sampling locations.

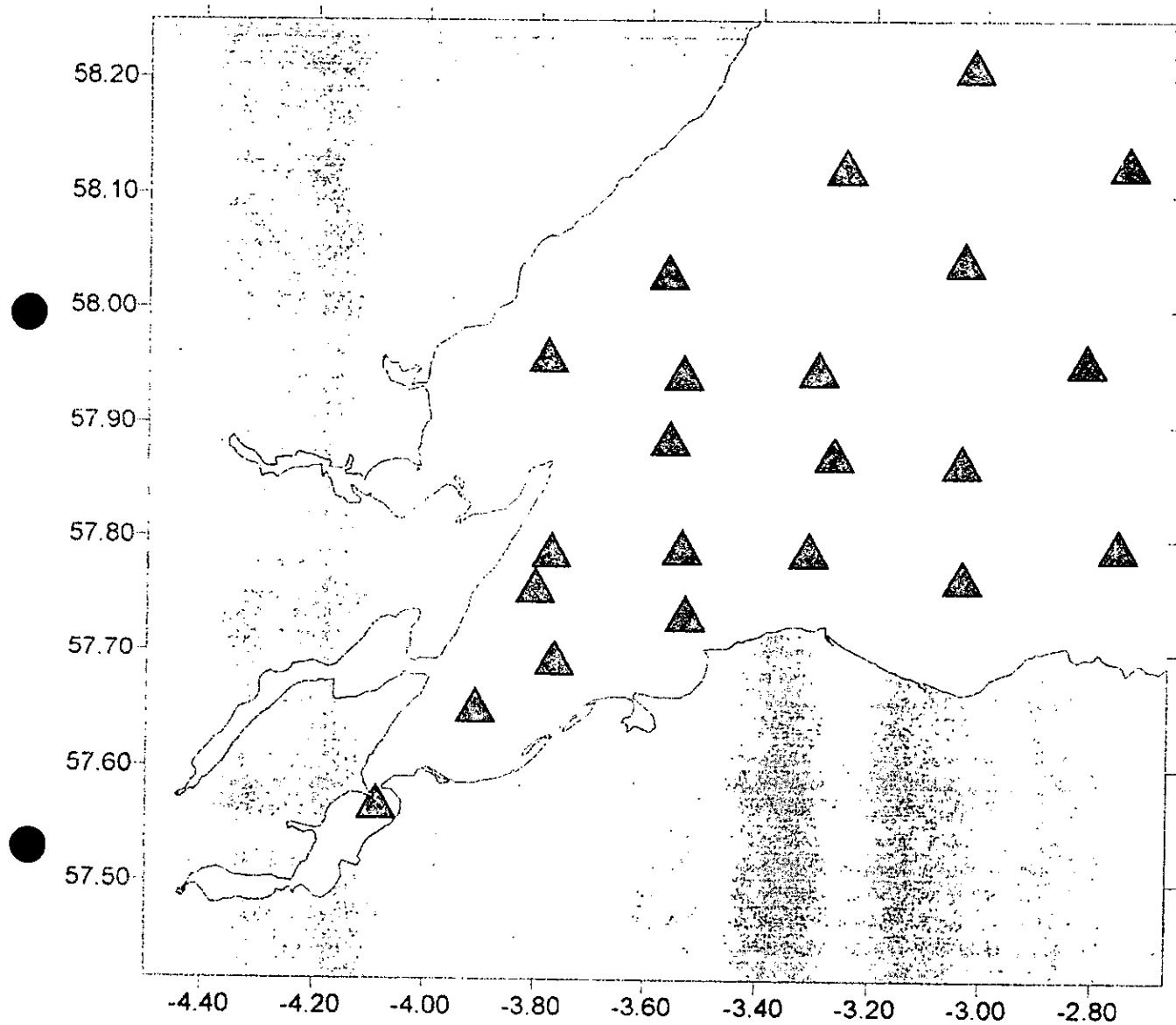


Figure 3. Demersal fishing locations.

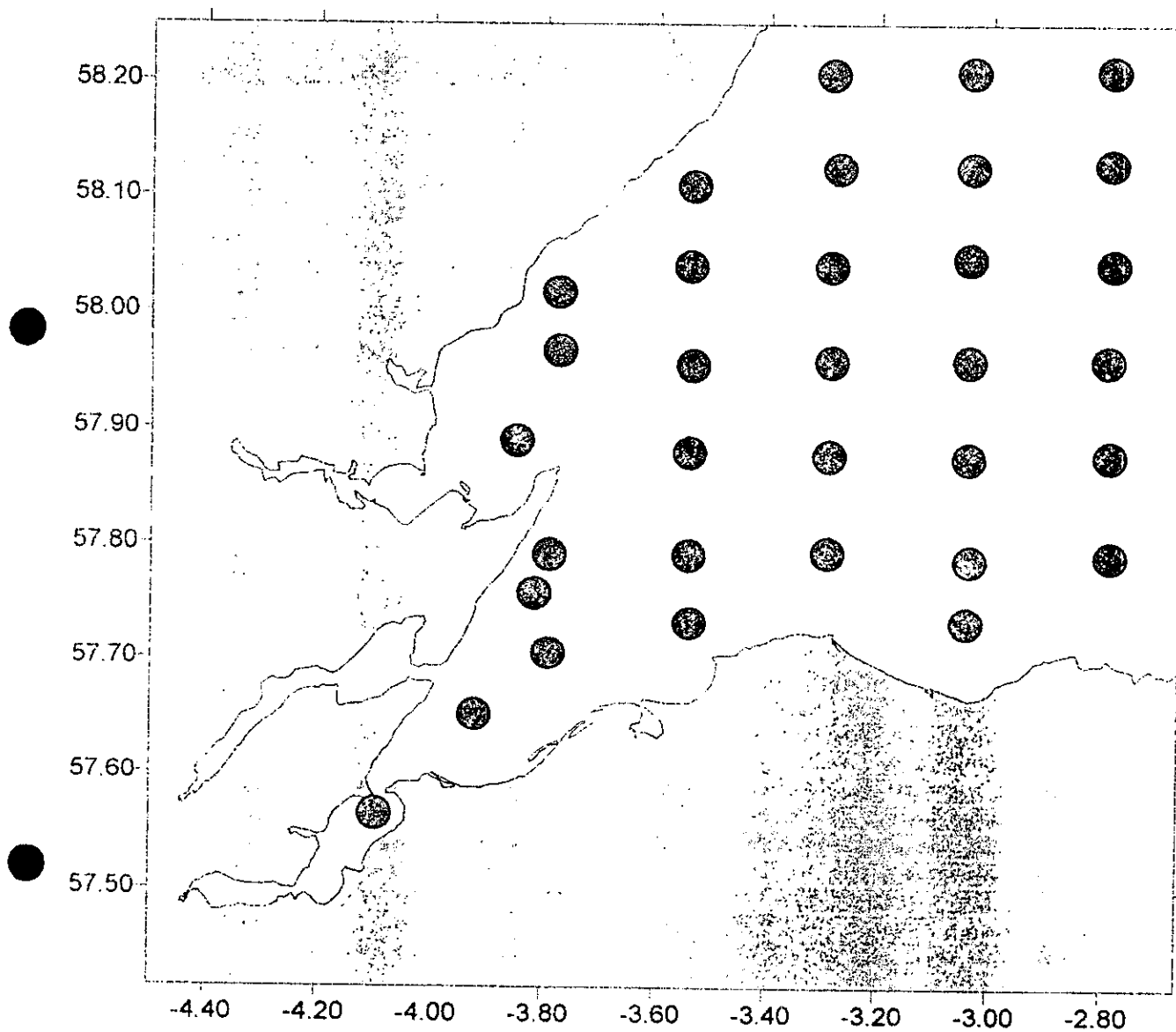


Figure 4. Sediment grab sampling locations.