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MINISTRY OF AGRICULTURE, FISHERIES AND FOOD
FISHERIES LABORATORY, LOWESTOFT, SUFFOLK, ENGLAND

1982 RESEARCH VESSEL PROGRAMME

REPORT: RV CIROLANA: CRUISE 7

(PROVISIONAL: Not to be quoted without prior reference to the author)

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DURATION:

11 August-8 September (29 days)

LOCALITY:

North Sea

AIMS:

As on Cruise Programme

NARRATIVE:

RV CIROLANA left Grimsby at 0740hrs GMT, 26 August 1982. The survey began at 133hrs, twenty miles north-east of Cromer Knoll. At this station the rigs for towing the 3 metre beam trawl and Agassiz trawl and for deploying the shallow water CTD were established and these gear and the shipboard sensors were tested prior to moving off into the southern bight of the North Sea. The pattern of work proposed for this cruise was to work alternate east-west lanes of stations northward from the southern bight to 61° 30'N, then for the second half of the cruise to work back south along the intermediate lanes of fishing stations. This plan was followed with some modifications imposed by steaming distances between fishing stations and the weather.

(Figure 1) AEP1 requirements for sampling water for caesium analysis were fulfilled by diversions to the water stations while steaming between fishing stations, and fish samples for caesium analysis were obtained from selected trawl hauls within designated areas. Benthos samples were obtained from the main trawl and with the 3 metre beam trawl on the outward passage and from the main trawl and the Agassiz trawl on the return. Photographs of the sea-bed were taken at every trawling position using a camera attached to the headline of the trawl. Environmental sensors measuring temperature, salinity, chlorophyll 'a', turbidity and particle size were operated throughout this cruise by pumping clean sea water from 5 metres over the sensors. In depth profiles of temperature and salinity were taken at every trawling station and in addition chlorophyll 'a' was measured at selected stations.

The echo sounder was run continuously and the Furono Colour sounder display observed in selected areas and some permanent records made. Following the final AEP1 water station a transect was made across the Flamborough oceanographic front using the environmental sensors. The ship lay off the mouth of the Humber on the morning of Wednesday, 8 September to clean the ship, pack up the samples and prepare for disembarkation at Immingham in the evening.

On this cruise bad weather curtailed fishing operations on four days and prevented all work on a further two days. For much of the cruise strong winds and heavy swells affected both fishing operations and/or delayed passage between stations. On 17 occasions the trawl was shot in wind speeds in excess of 25 knots in marginal fishing conditions and only 74 trawl hauls were accomplished. Of these only one invalid haul was not repeated and this due to adverse conditions.

RV CIROLANA docked at Immingham at 1748hrs GMT on Wednesday, 8 September prior to entering dry dock on the morning of 9 September. Staff helped unload on the evening of 8 September and returned to Lowestoft by bus on 9 September.

RESULTS:

Aim 1. 73 fishing stations were worked successfully including all but 2 of the original groundfish survey primary stations. (Figure 2).

At each station the weight of each species of fish and shellfish of commercial importance was recorded. The length distributions of each fish species was obtained and the results recorded on data forms and input to the computer. Validity checks were made on the computer file and the data summarised in various ways. A summation of the total fish catch and the average weight for each species is given in Table 1.

Length distributions were obtained for all species and stratified samples of otoliths collected for cod, haddock, whiting, saithe, Norway pout, pollack and plaice for appropriate ICES sampling areas.

Stomachs were preserved from all gadoid species encountered and from mackerel at selected stations. Samples of fish were also collected for caesium analysis (Table 2).

AIM 2:

Surface water samples for caesium analysis were collected and processed from 59 stations and from surface and bottom at 5 stations (Figure 3).

AIM 3:

Continuous measurements of temperature, salinity and chlorophyll 'a' were obtained from the clean sea water pump; particle size counts were made in the size range 2-2500 at 9 minute intervals for each of three sensors overlapping within this range and turbidity and oxygen values recorded at each station. In addition 79 surface to bottom transects of temperature and salinity were made, 73 at the trawl stations and 6 on a transect from 55°N 30'E to 54°N 30'E. At selected stations the Chelsea-Oriel sub-aquatrak was used to measure chlorophyll 'a' profiles.

These measurements indicated that a pool of cold bottom water with salinity in excess of 35^o/oo was present in the central and northern North Sea. This was separated from the surface water by a strong thermocline above which the salinity was usually less than 35^o/oo and from coastal water by a frontal system. The tidal front at Horn's Reef off the Danish coast was particularly strongly developed.

AIM 4:

The Furono colour sounder was used to look at differences between coastal mixed water and offshore stratified water waves and indicated that the scatter layer was strongly developed in water masses where the thermocline was well developed, but inshore and in mixed water the whole water column was dense with echo trace. Herring shoals were observed near their spawning grounds on the east coast of England and Scotland and Spawning herring were taken occasionally in the trawl in this region.

AIM 5:

Benthos was recorded from each Granton trawl haul. Large specimens were measured and where appropriate sexed, and much of the smaller benthos was preserved for identification at a later date.

To sample the smaller benthos more efficiently a 3 metre beam trawl was used at 21 stations between 10 August and 22 August when the net was lost. From then on the Agassiz trawl was used at 16 stations (Figure 4). Pedometers were fitted to the trawls in an attempt to quantify the results, and with the aid of an under water camera to estimate catch efficiency.

The under water camera was used on every Granton trawl haul and programmed to take one photograph each minute. The camera worked on all but 6 stations where the film failed to wind on, some 5000 μ /w photographs (colour transparencies) were taken of the sea bed during this cruise. Two short strips of exposed film were developed on board to check exposure times.

AIM 6:

The HP 1000 computer was used throughout this cruise. The catch and length data was input into disc and catch and length summaries produced. Charts showing the cruise track and various sampling positions were produced and are appended to this report.

The data logger was also used throughout this cruise, but unfortunately a fault in the disc hardware prevented a complete record of the cruise being logged.

The Decca and Satellite Navigator interfaces to the computer system were used for the first time, both worked well, but decca information must be supplemented regularly by chain and lane titles and this is not satisfactory.

A problem with some of the disc cartridges caused corruption of some software and a call was made to Frascburgh where complete software and spare discs were collected from the Pilot Boat.

Seen in Draft: M J Willcock, Captain
W J Saxby, Fishing Skipper

D Harding SIC

TABLE 1 AVERAGE AND TOTAL CATCH OF ALL SPECIES CAUGHT FOR ALL STATIONS ON THE 1982 GROUND FISH SURVEY

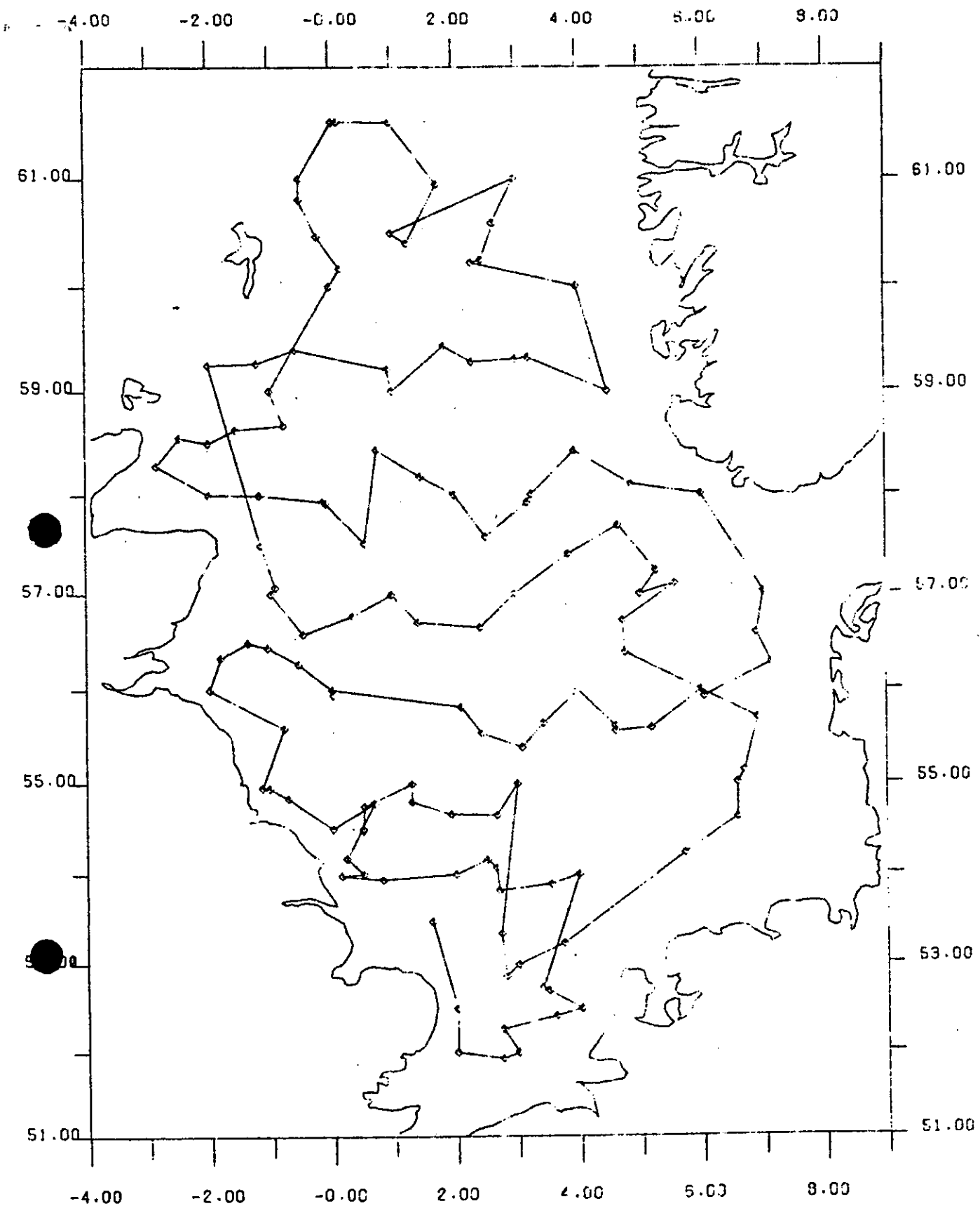
SPECIES	CATCH	AVERAGE CATCH
Blue whiting	81.35	1.13
Cod	2108.85	29.29
Haddock	8810.65	122.37
Hake	35.15	.49
Ling-common	87.45	1.21
Norway pout	1043.48	14.49
Pollack	31.50	.44
Poor cod	105.50	1.47
Saithe	2553.65	35.47
Tusk	5.20	.07
Whiting	4746.97	65.93
Whiting pout	9.60	.13
Gadiculus	.97	.01
Triglops	.01	.00
Bull rout	2.05	.03
Lumpemus	.50	.01
Brill	4.80	.07
Dab	2608.79	36.23
Dab long-rough	390.72	5.43
Halibut	5.40	.08
Lemon sole	337.80	4.69
Megrin	9.66	.13
Plaice	560.21	7.78
Turbot	35.15	.49
Witchling	16.57	.23
Solenette	1.16	.02
Snake Blenny	.61	.01
Lesser Weever	47.82	.66
Argentine sphyraena	10.74	.15
Catfish	67.45	.94
Dragonet	9.67	.13
Gurnard grey	932.60	12.95
Gurnard Tub	13.10	.18
Lumpsucker	.10	.00
Monk	150.77	2.09
Rockling 3-beard	8.03	.11
Rockling 4-beard	1.56	.02
Sandeel	23.42	.33
Sebastes viviparous	12.25	.17
Squid	65.91	.92
Hagfish	.80	.01
Bullhead	.71	.01
Argentine silus	.50	.01
Herring	1770.94	24.60
Horse mackerel	661.61	9.19
Mackerel	766.45	10.65
Sprat	158.82	2.21
Maurolicus	.02	.00
Pilchard	.20	.00
Lesser spotted dogfish	30.87	.43
Spurdog	428.84	5.96
Tope	1.00	.01
R Clavata	39.56	.55
R Montagui	36.00	.50
R Naevus	50.38	.70
R Radiata	449.80	6.25
Pandalus	17.70	.25
Crab	11.35	.16
Nephrops	23.30	.32
Spider crab	21.90	.30
Total	29407.91	408.44

TABLE 2

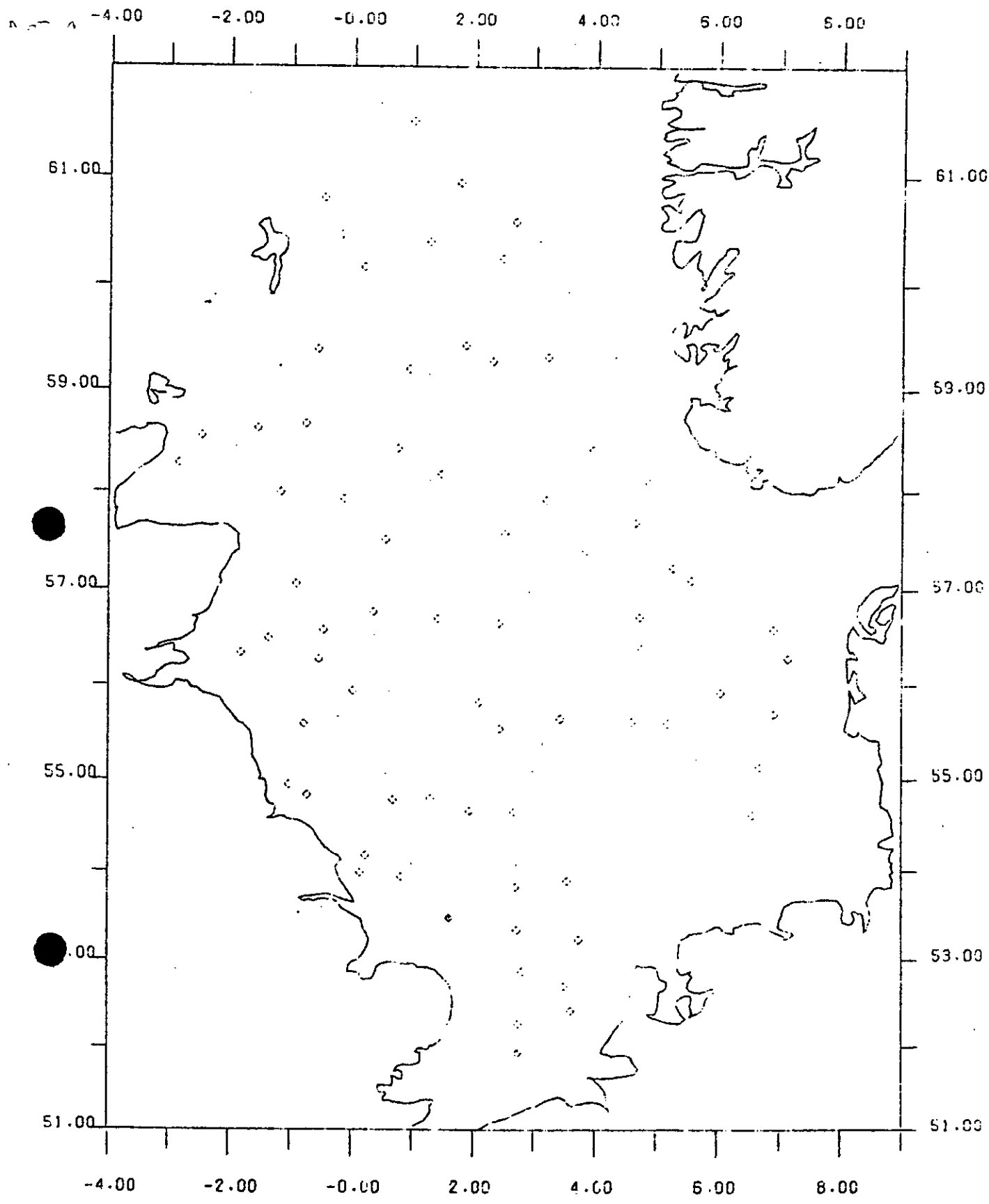
AEP FISH SAMPLES FOR CAESIUM ANALYSIS

AREA					
1	COD	PLAICE	WHITING		
2	"	"	"		
3	"	"	"	HADDOCK	
4	"	"	"	NIL	
5	"	"	NIL	NIL	
6	"	NIL	NIL	"	
7	"	NIL	NIL	"	
8	"	NIL	NIL	"	
9	"	NIL	NIL	"	
10	"	NIL	NIL	"	
11	"	NIL	NIL	"	SAITHE
12	"	NIL	NIL	"	NIL

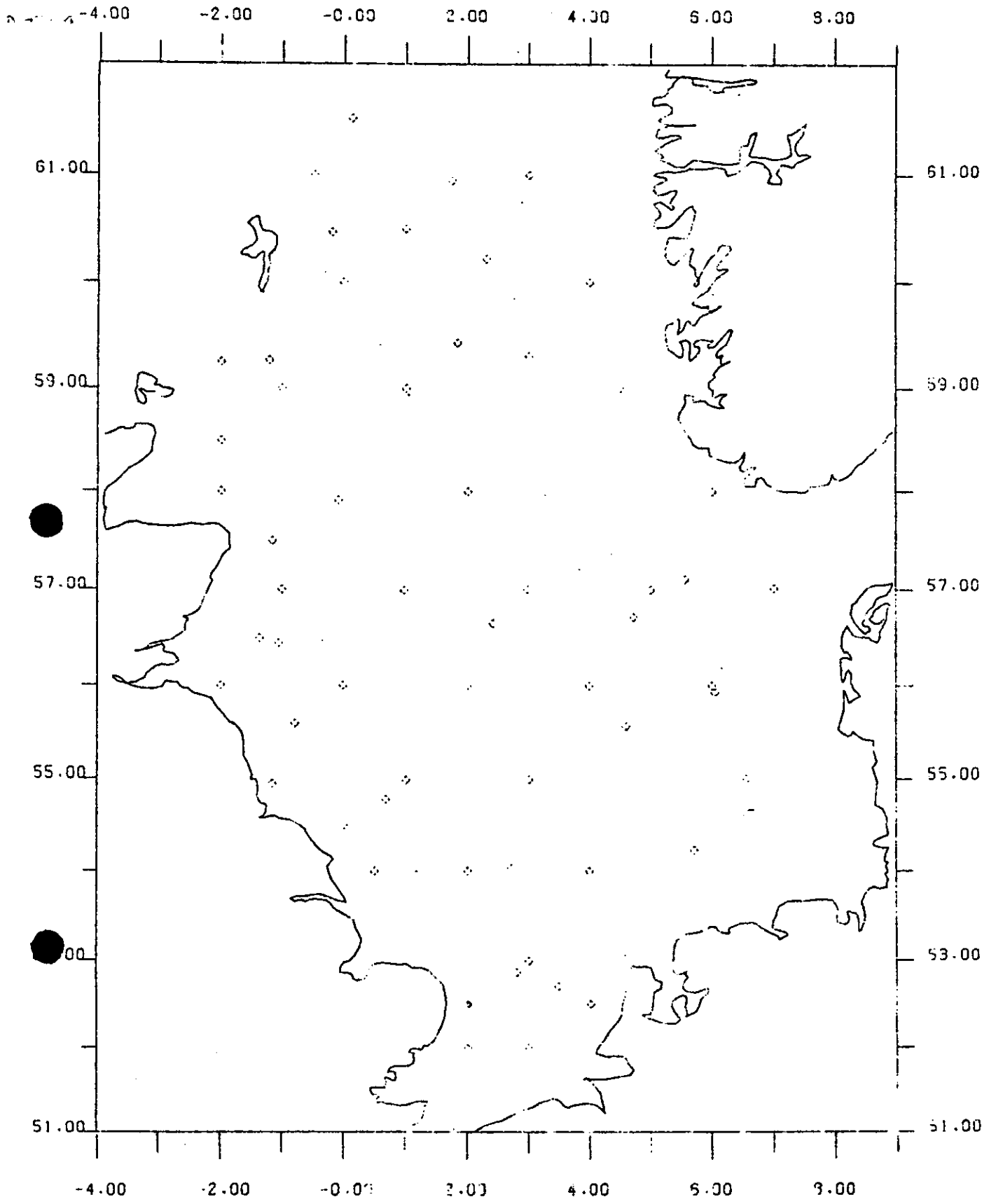
2 kg FILLETS MINCED FOR RADIOCAESIUM ANALYSIS



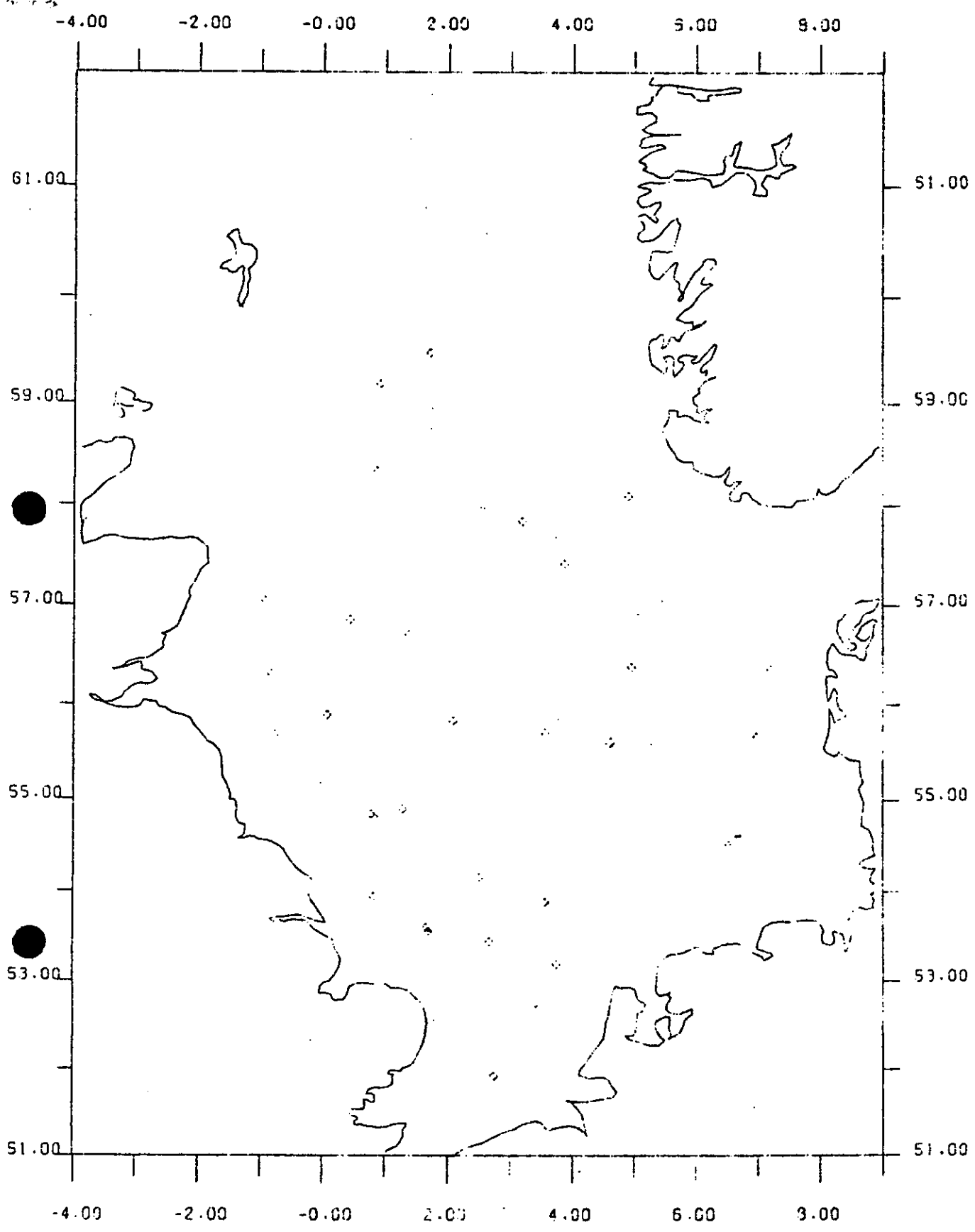
CIROLANA 7/82 CRUISE TRACK



CAROLANA 7/82 TRAWL STATIONS



CAROLANA 7/92 REPI WATER STATIONS



CIRIANA 1/92 BENTHOS STATIONS