Department of Agriculture for Northern Ireland
Agriculture and Environmental Science Division

Cruise Report: LF1395 Ichthyoplankton Survey (EU/AIR3 cruise 6)
Vessel: RV *Lough Foyle*
Dates & area: 14-22 March 1995 in the Irish Sea; ICES div. VIIa

Personnel:	Mark Dickey-Collas	DANI	SIC/HSO
	Willie McCurdy	DANI	SSO
	Colm Reavey	DANI	SO
	Michael McAliskey	DANI	SO
	Peter Coulahan	QUB	research assistant
	Gillian McCullough	QUB	student
	Clive Fox	MAFF	HSO

Objectives:

1. To survey the distribution and abundance of fish eggs for the AIR egg abundance project (AIR3 2263).
2. To collect fish eggs for iso-electric focusing.
3. To investigate the abundance of fish and *Nephrops* larvae in the Irish Sea.
4. To collect fish larvae for lipid analysis, C & N content and otolith primary increment analysis.
5. To investigate the abundance of euphausiids and other macro zooplankton in the Irish Sea.
6. To collect samples for a Queens/DANI studentship.

Cruise narrative

Tuesday 14 March 1995

All scientific crew were onboard by 21:00, and the ship sailed for the first station (38E47) at 21:50 (Figure 1). A full safety drill and smoke hood demonstration took place before sailing.

Wednesday 15 March 1995

The sampler was deployed at 01:00 and recovered immediately as a result of software and data logging problems. Various attempts were made to resolve the problem, but

by 04:00 the Pronet system still failed to function properly, so the *Lough Foyle* returned to Belfast. The ship docked at 08:30. The data acquisition problem was rectified in port, with the assistance of the Pronet manufacturer in Plymouth, and the ship left for the first station at 11:15. Sampling started at 13:57 and continued through to midnight (Figure 1).

Thursday 16 March 1995

Despite the very poor weather, sampling continued throughout the day, using the Irish coast for shelter. 20 hauls of the high speed plankton sampler were taken and one ring net deployment was made for copepod production experiments. Sampling ceased at 23:30, due to the poor weather, and the ship headed south to Rosslare for shelter.

Friday 17 March 1995

The ship remained at anchor all day at Rosslare, in force 9-10 winds.

Saturday 18 March 1995

The *Lough Foyle* set sail at 00:20 for the Welsh coast. Sampling started at 08:15 with haul number 31 (Figure 1). The large swell caused by the poor weather prevented the two most southerly stations from being sampled. The ship worked the grid north for the rest of the day.

Sunday 19 March 1995

The ship sampled all day (hauls 43-61), and completed the north Wales coast despite delays caused by the strong spring tides.

Monday 20 March 1995

Sampling continued (hauls 62-83). The stations in the western Irish Sea and Morecambe Bay were completed. After haul 70, female copepods were sampled with a ring net for production experiments. Sampling in Morecambe Bay was delayed by the presence of a geological survey ship in the vicinity of the gas rigs.

Tuesday 21 March 1995

From 00:00 to 07:00, hauls 84 to 89 were taken. The ship entered Douglas harbour at 07:15, to drop a crew member on the island. Then assisted by the tides, another 15 hauls were made, thus com pleting the north west section of the survey grid.

Wednesday 22 March 1995

The final 5 stations were sampled (hauls 106-110), and the ship headed for Belfast. The *Lough Foyle* docked at 10:00 in Belfast.

Methods

At each station the high speed plankton sampler was deployed to 3m off the sea bed. At shallow stations a double, double oblique haul was carried out so as give a sufficiently large sample for egg analysis. The temperature, salinity and fluorescence of the water column, and the flow through the sampler, was monitored with the Pronet system. The plankton samples were sorted and the fish and *Nephrops* larvae removed and fixed in either 4% buffered formaldehyde or 99% ethanol. Large Crustacea were also removed from the sample and weighed to the nearest 0.1g. The remaining sample was viewed under a dissecting microscope and sorted for fish eggs. Up to 30 eggs, with no clear means of identification, per station were then measured, staged and frozen for iso-electric focusing. The remaining plankton sample was fixed in 4% buffered formaldehyde and stored.

Results

The grid was successfully sampled in 8 days, with only the two stations unsampled. Over 18,500m^3 of water was sampled for plankton at 104 stations. The survey grid was designed to sample areas of higher fish egg production at higher intensity. As predicted, first observations suggest that these regions (the Irish, Manx, Welsh and Cumbrian coasts) did have higher egg densities. From these regions, over 900 eggs were picked and frozen for iso-electric focusing.

As expected from the timing of the cruise, catches of fish larvae and *Nephrops* larvae were low (figures 2 and 3). The majority of fish larvae caught were sand eels and pleuronectids. All of the *Nephrops* larvae were stage one, and were caught over well established *Nephrops* grounds.

Other macro-zooplankton species were found in the samples, with euphausiids and *Pasiphaea* making up most of the biomass. The euphausiid distribution appeared to be ubiquitous through out the region, except for very coastal areas (figure 4). Estimates of the euphausiid abundance in the western Irish Sea suggest that the biomass has dropped ~~to~~ by 70% over winter (55,000 tonnes in November 1994 to 16,500 tonnes in March).

Most of the water in the region was well mixed. However the deep basin in the western Irish Sea had a lens of warmer water at the seabed (figures 5 and 6a, b, c)

which came to the surface in the centre of the western Irish Sea. Fresh water inputs were apparent on the Irish and English/Solway Firth coast (figure 7).

Acknowledgements

The officers and crew of the RV *Lough Foyle* must be thanked for their hard work and help. Their dedication lead to a very successful cruise. The commitment and ardour of the scientific team was crucial to the successful completion of the cruise.. They worked well despite the extremely rough weather and maintained a high standard of operation and productivity. Their team work and efficiency must be commended

Signed

SIC: Mark Collins Date: 28/3/95

Master: Date:

Section Head: S. J. Kenny Date: 28/3/95

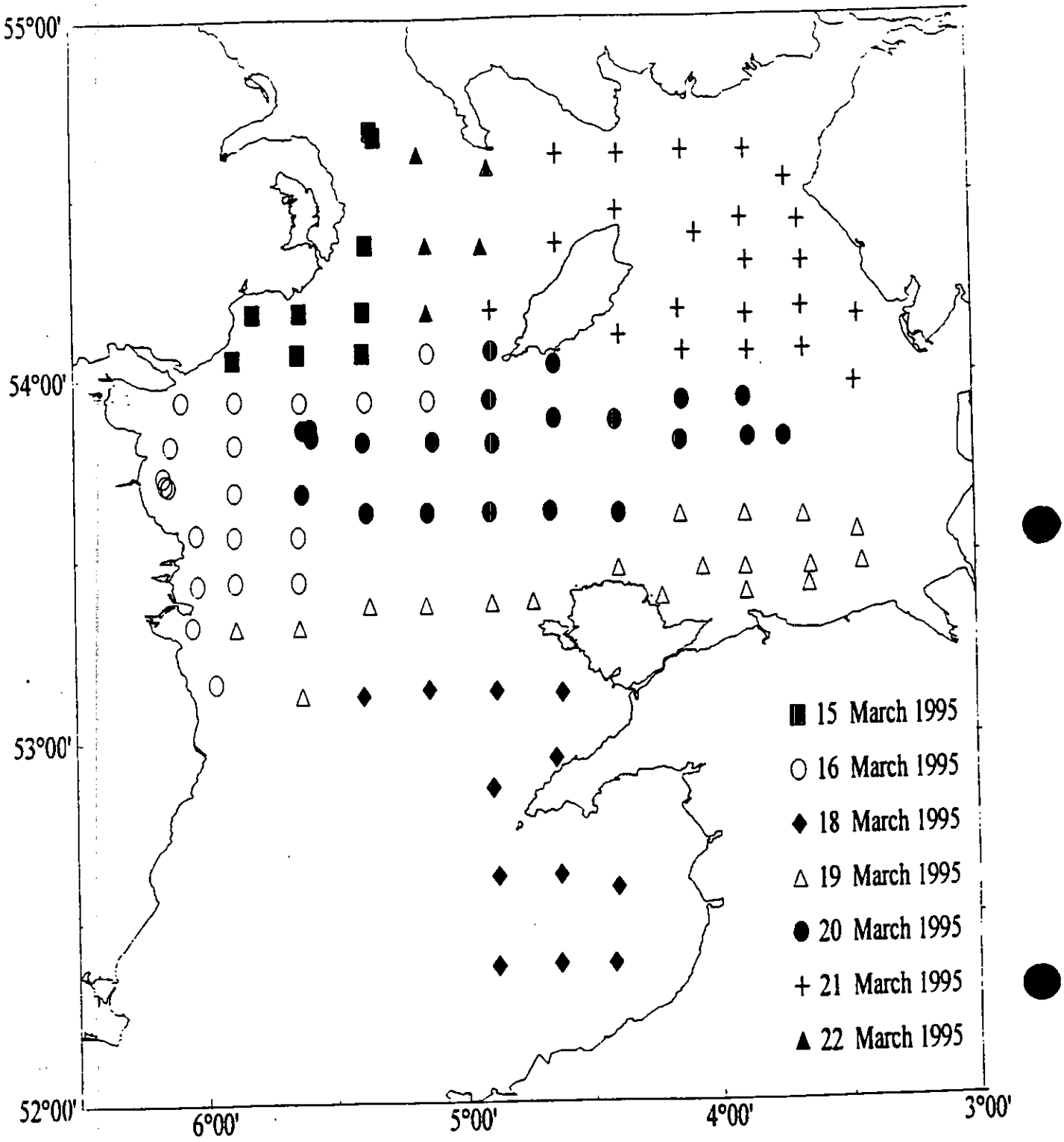

Figure 1, Stations sampled in March 1995, on LF1395

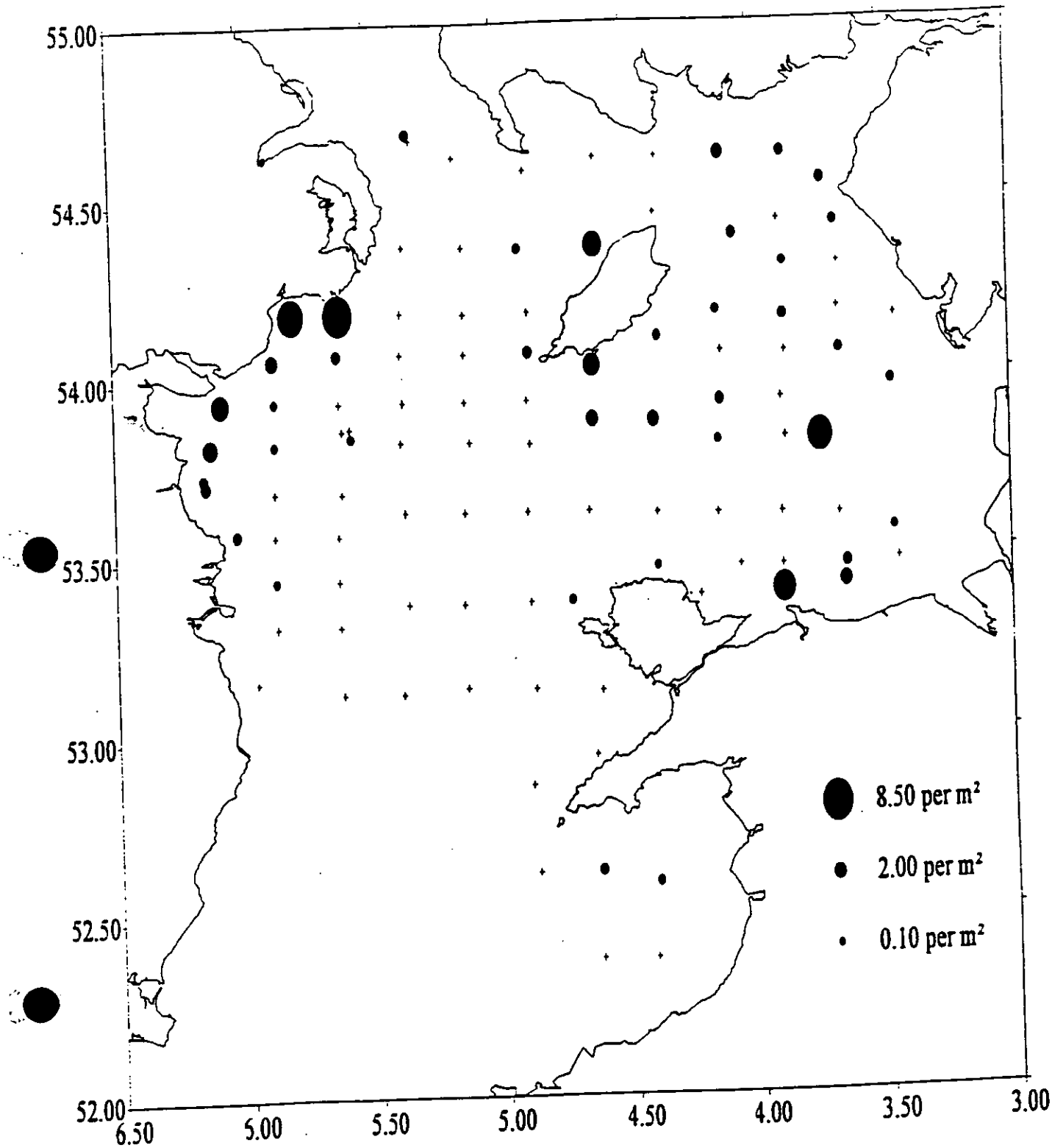

Figure 2, number of fish larvae per m² in March 1995 on LF1395

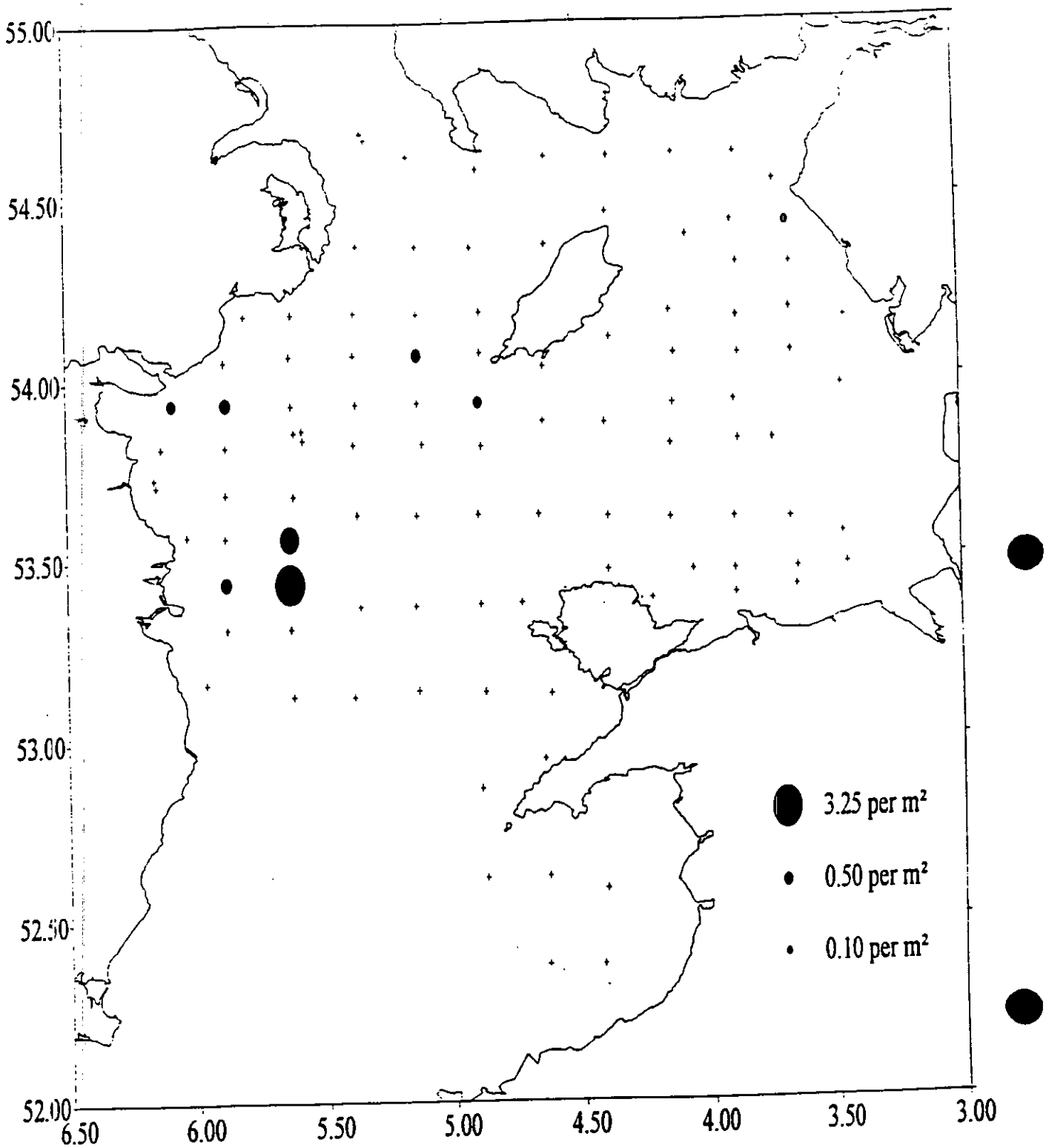

Figure 3, number of *Nephrops* larvae per m² in March 1995 on LF1395

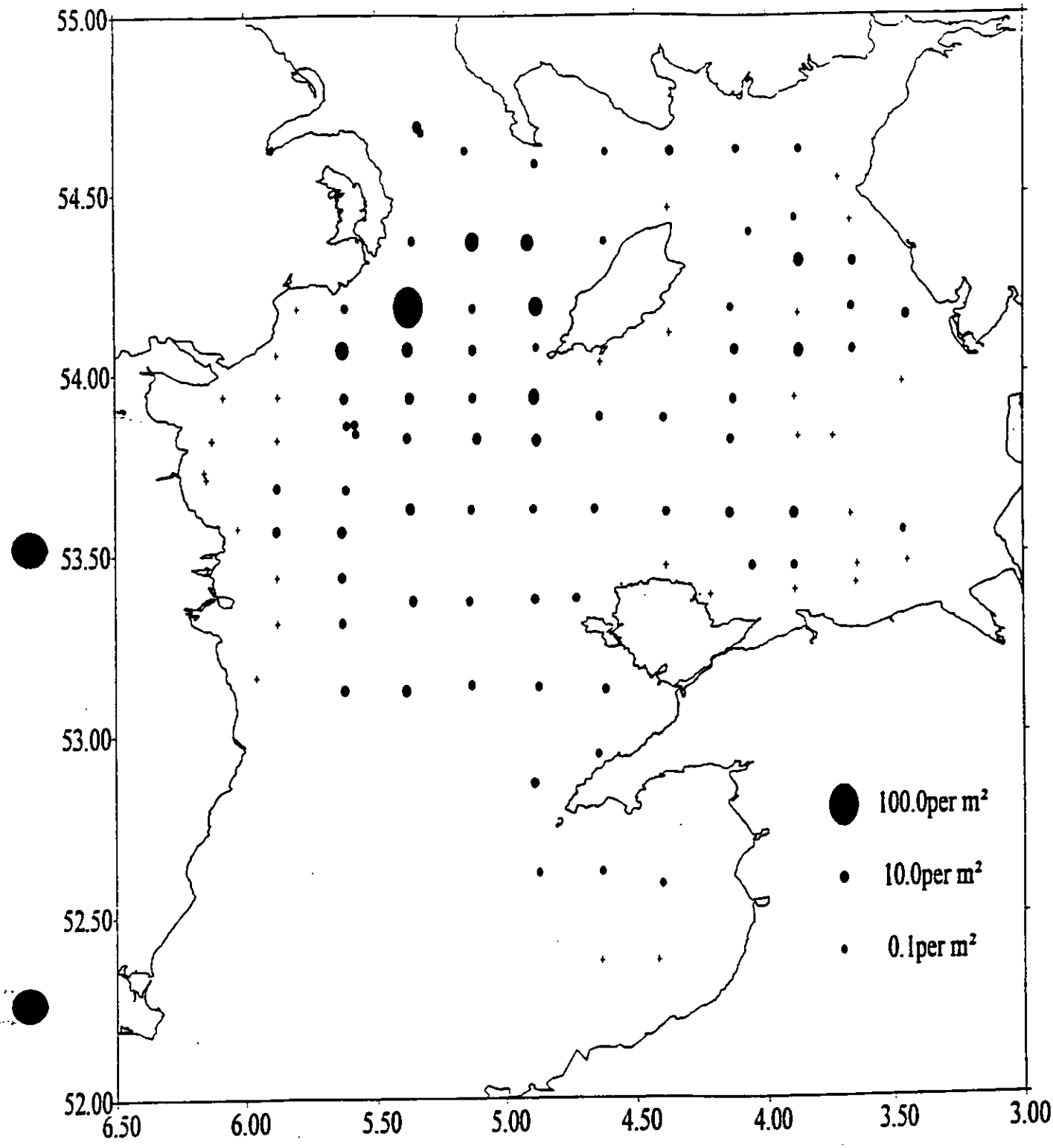

Figure 4, number of euphausiids per m² in March 1995 on LF1395

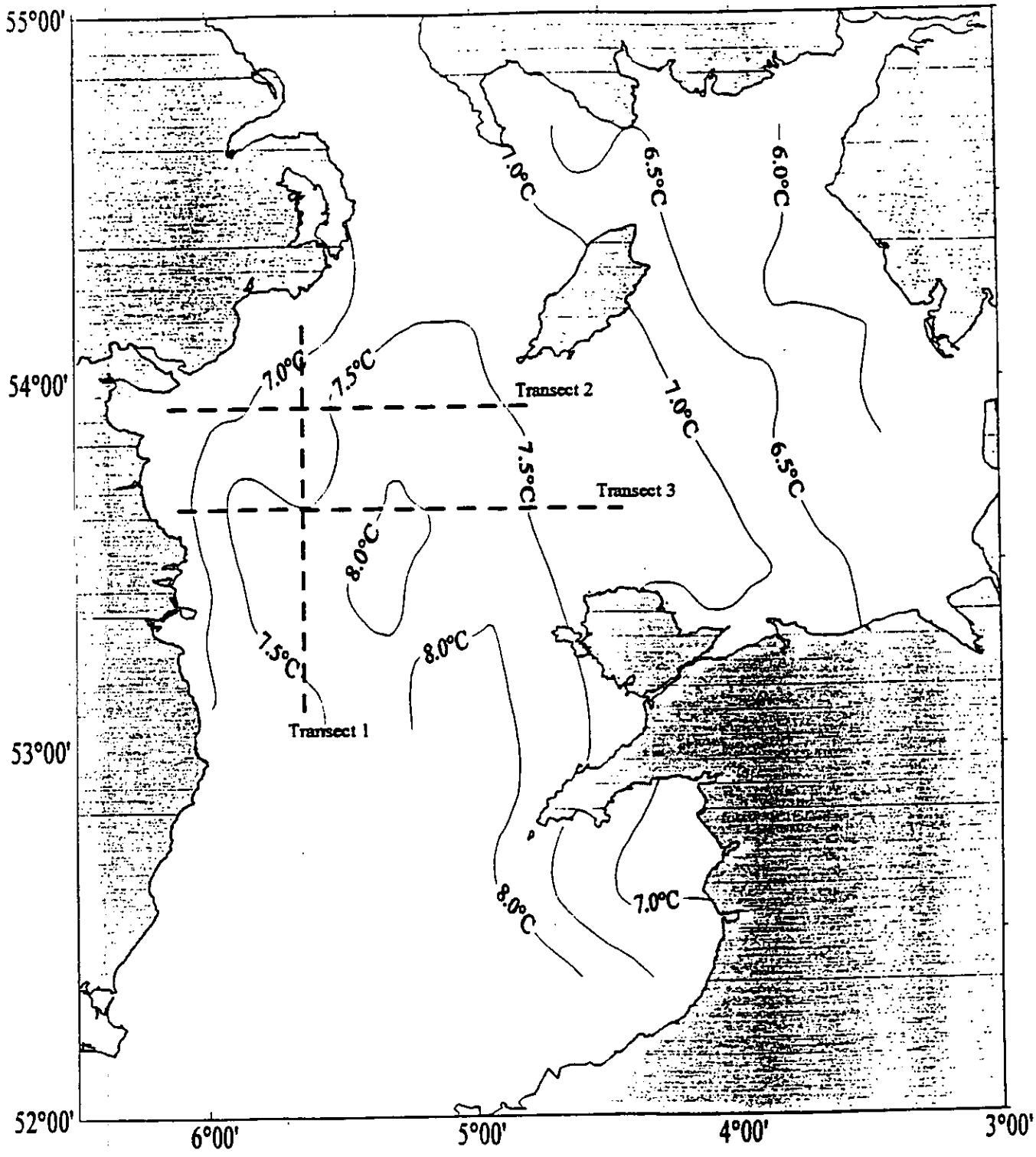

Figure 5, mean temperature of the water column (°C) from 14-22 March 1995 on LF1395

Dotted lines show three transects for vertical temperature mapping

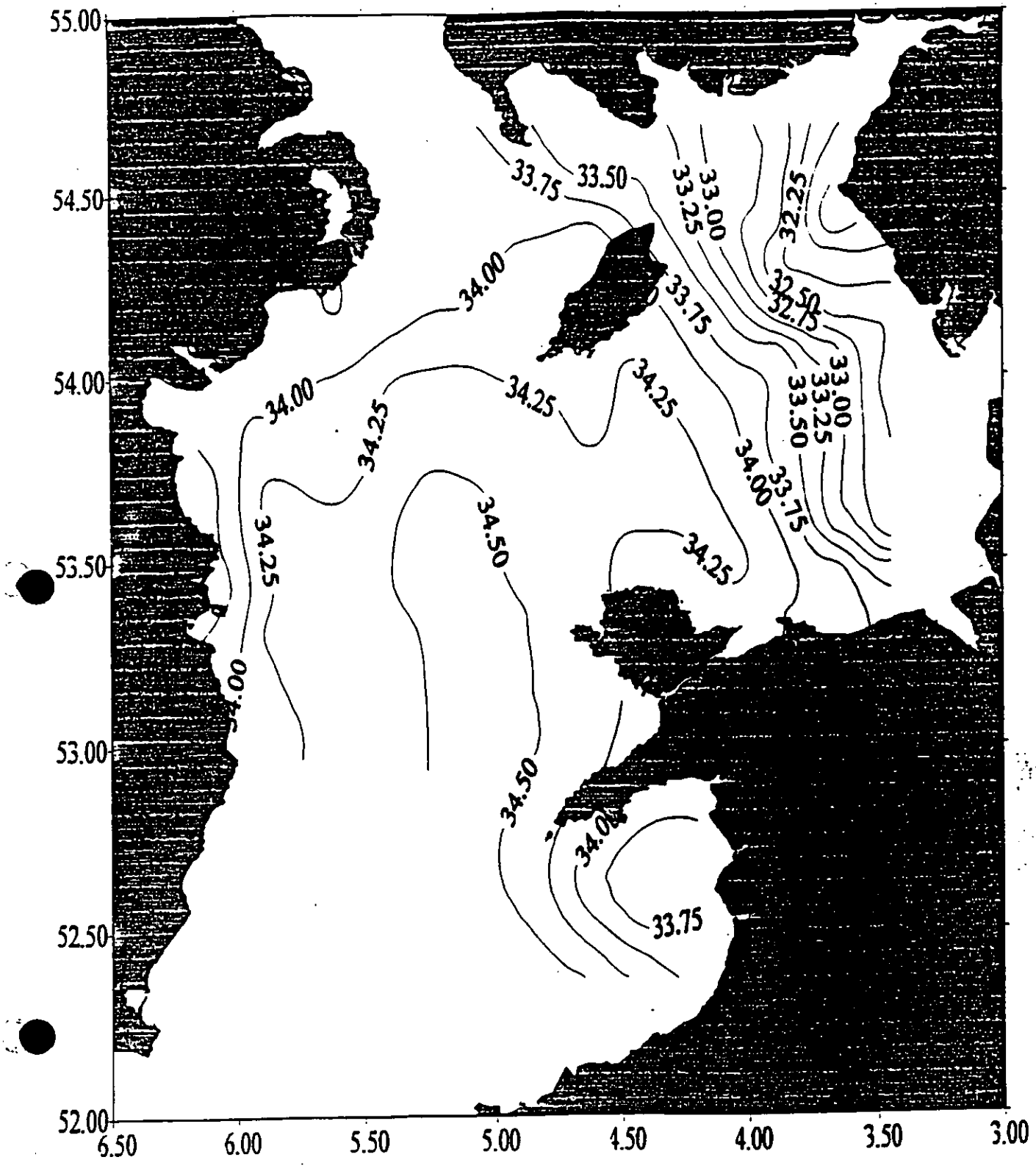

Figure 7, mean salinity of the water column (°/oo) from 14-22 March 1995 on LF1395