

Department of Agriculture for Northern Ireland
Agriculture and Environmental Science Division

Cruise Report: LF3295 Ichthyoplankton Survey (EU/AIR3 cruise 11)

Vessel: RV *Lough Foyle*

Dates & area: 18-26 April 1995 in the Irish Sea; ICES div. VIIa

Personnel:	Mark Dickey-Collas	DANI	SIC/HSO
	John Peel	DANI	ASO
	Chris Burns	DANI	ASO
	Michael McAliskey	DANI	SO
	Peter Coulahan	QUB	research assistant
	Maria O'Neill	DOM	research assistant

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 18 April 1995

All scientific crew were onboard by 21:00, and the ship sailed for the first station (38E47) at 22:00 (Figure 1). A full safety drill and smoke hood demonstration took place before sailing.

Wednesday 19 April 1995

The vessel headed east and completed the stations in the north east Irish Sea, hauls 1-21 (Figure 1).

Thursday 20 April 1995

Due to the continuing northerly winds the ship continued working in the eastern Irish Sea and hauls 22-43 were made.

Friday 21 April 1995

The ship worked its way around the Welsh coast to Cardigan Bay (hauls 44-62).

Saturday 22 April 1995

The *Lough Foyle* headed north and then west to the Irish coast. However the sea conditions worsened as the winds increased and sampling had to cease at 15:00. The ship dodged off Dublin waiting for the strong NE winds to die down.

Sunday 23 April 1995

Sampling began at 06:00 but further problems were encountered when the nets began to clog with phytoplankton (haul 73-75). Clogging occurred at 60-70m depth, and was reflected by an increase in fluorescence at this depth. To enable sampling to continue the net was changed to the larger mesh size of 425 μ m (from 280 μ m). Hauls 76 to 88 were then successfully carried out.

Monday 24 April 1995

The ship continued working in the western Irish Sea and hauls 89 to 110 were made. The larger meshed net was replaced with the 280 μ m net after haul 101, as clogging was thought unlikely to occur outside the coastal region.

Tuesday 25 April 1995

In increasingly poorer sea conditions the last three stations were sampled (Figure 1). The ship headed back to Belfast at 04:45 and docked at 10:15 in Barne's Dock, 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. Over 14,000m³ of water was sampled for plankton at 106 stations. The survey grid was designed to sample areas of higher fish egg production at higher intensity. The number of fish eggs caught was far lower than in March, so only 120 were plated for iso-electric focusing.

As expected, fish larvae were more abundant in the coastal region (figures 2). The catches were dominated by sand eels and pleuronectids. Whilst gadoids were caught they were not as numerous as other groups. *Nephrops* larvae were caught over the two fishing grounds (figure 3). Both stocks seemed isolated from each other, with initial estimates of larval abundance suggesting that the western stock is 20 times bigger than the eastern stock (110.0 billion larvae in the west, 4.8 billion in the east).

Other macro-zooplankton species were found in the samples, with euphausiids, *Pasiphaea* and ctenophores making up most of the biomass. Euphausiid numbers were lower than in March (72%), but their distribution was typical for the summer season over the deeper seasonally-stratified water in the western Irish Sea.

Most of the water in the region was well mixed. Fresh water influenced the surface layers near the Solway Firth, Liverpool Bay and the Irish coastal region (figure 5). Stratification of the water column was found in the eastern and western Irish Sea, however it was due to the presence of haloclines and not temperature stratification (figures 6). This finding supports the results of previous surveys this year which suggest a large saline input at depth from the south, with fresher water on the surface influenced by the Irish coast. This Irish coastal region also exhibited the highest fluorescence (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 completion of the cruise. Peter and Maria are

particularly thanked for their help and hard work. The good humour and energy of the team as a whole ensured that the cruise was very productive and a complete success.

Signed

SIC: *M. Callas.*

Date: *1 / 5 / 95.*

Master:

Date:

Section Head:

Date:

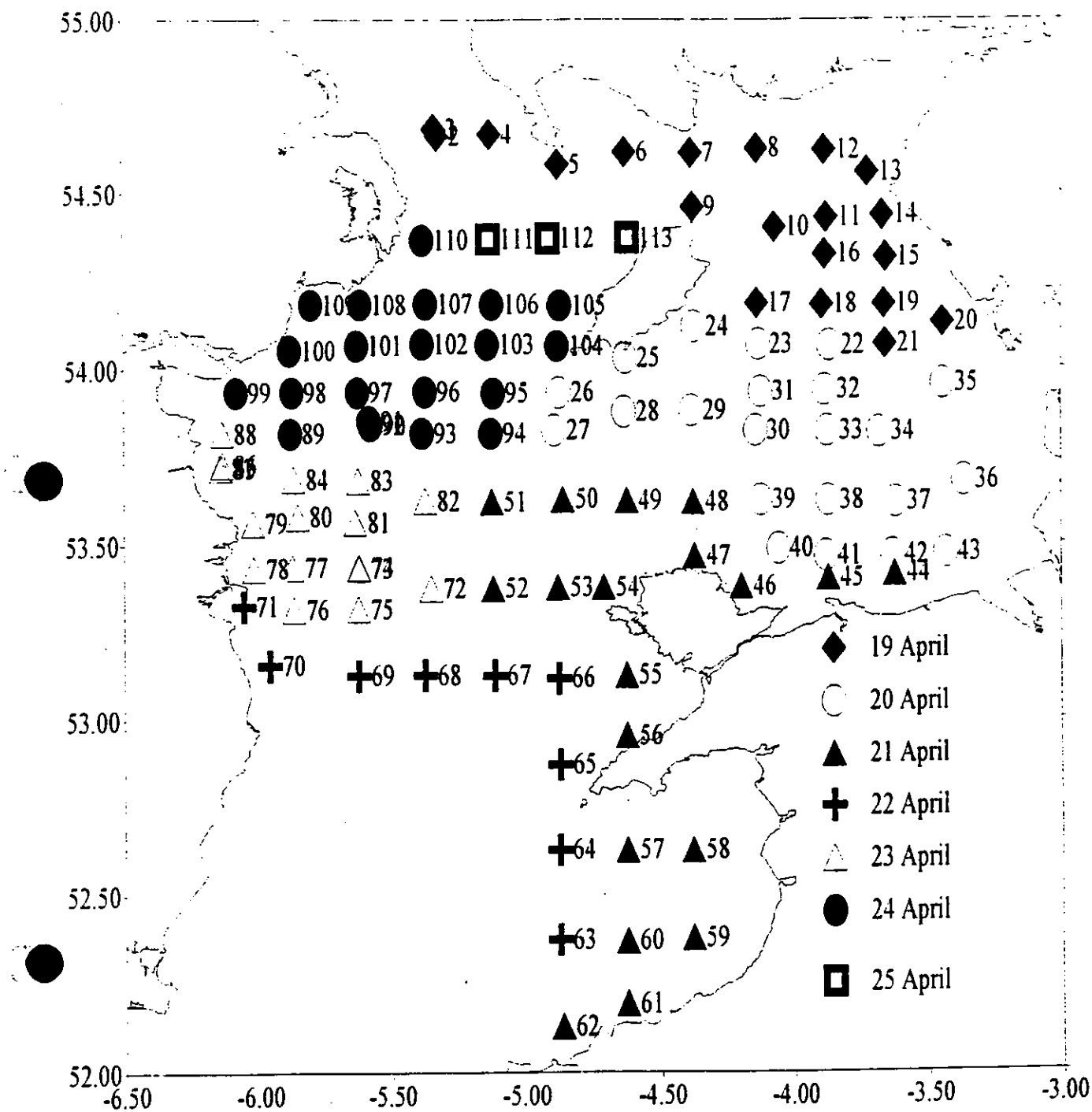


Figure 1 Hauls made in April 1995 on LF3295

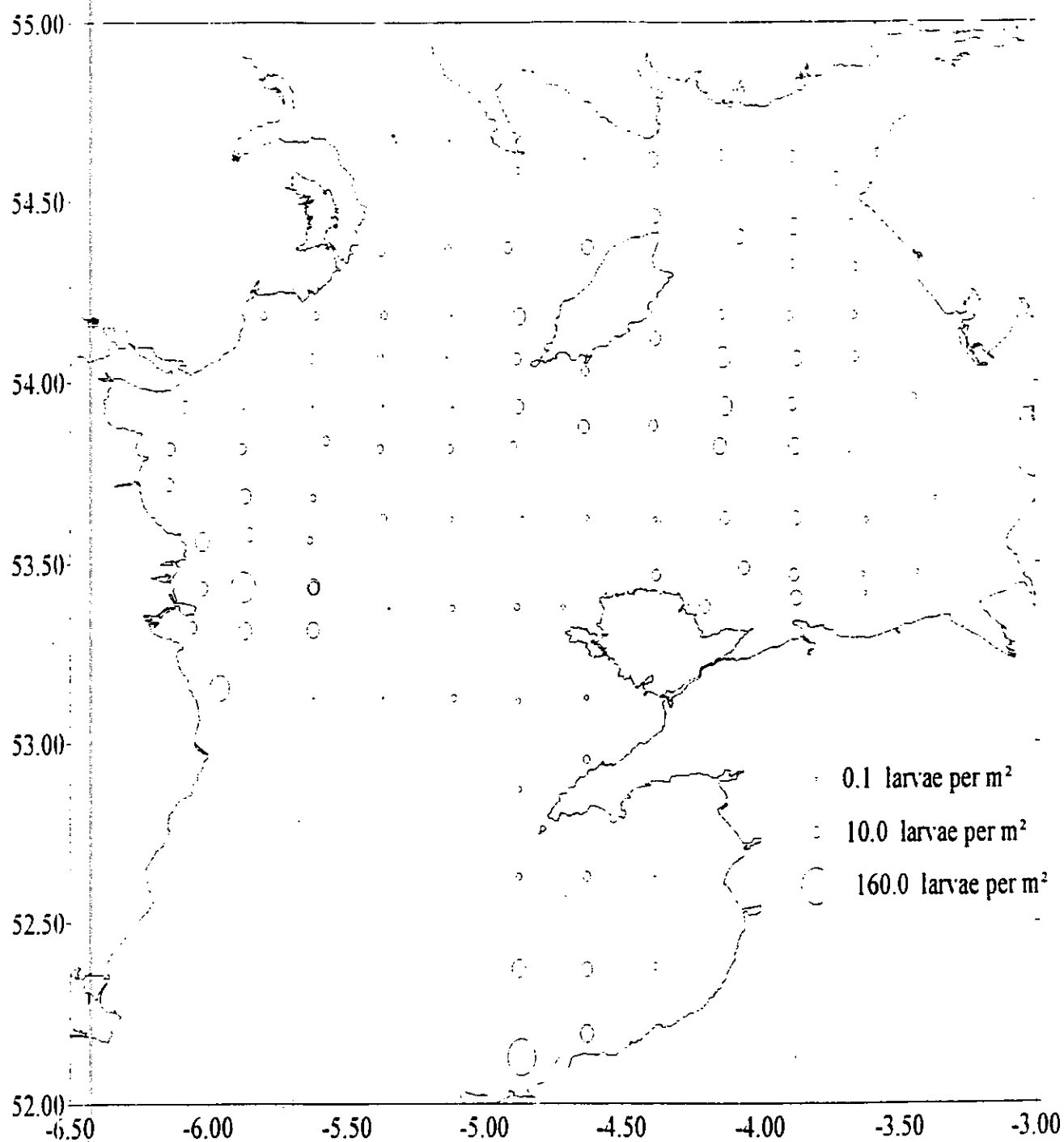


Figure 2 Fish larvae per m² in April on LF3295

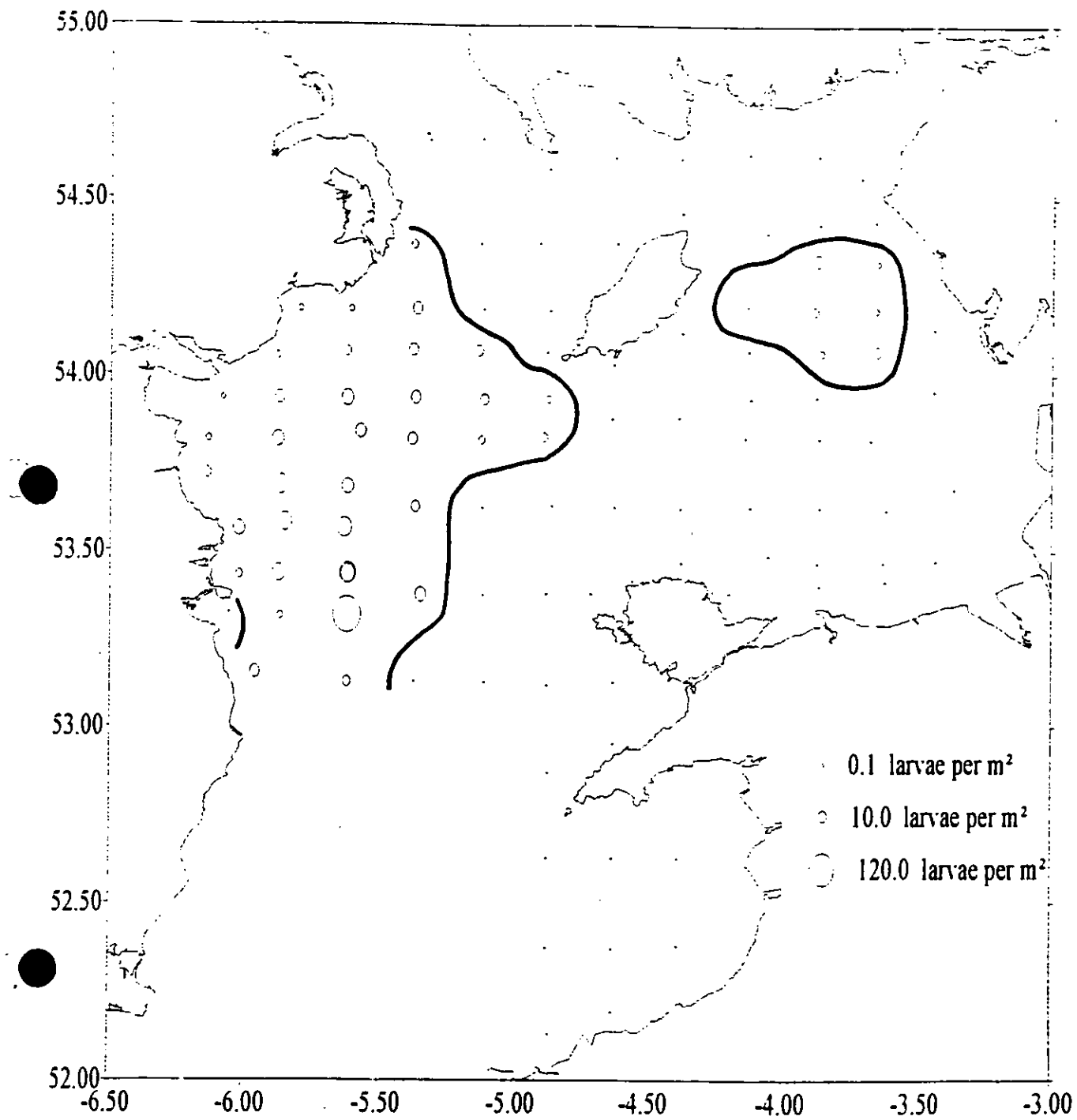


Figure 3 *Nephrops* larvae per m² in April on LF3295

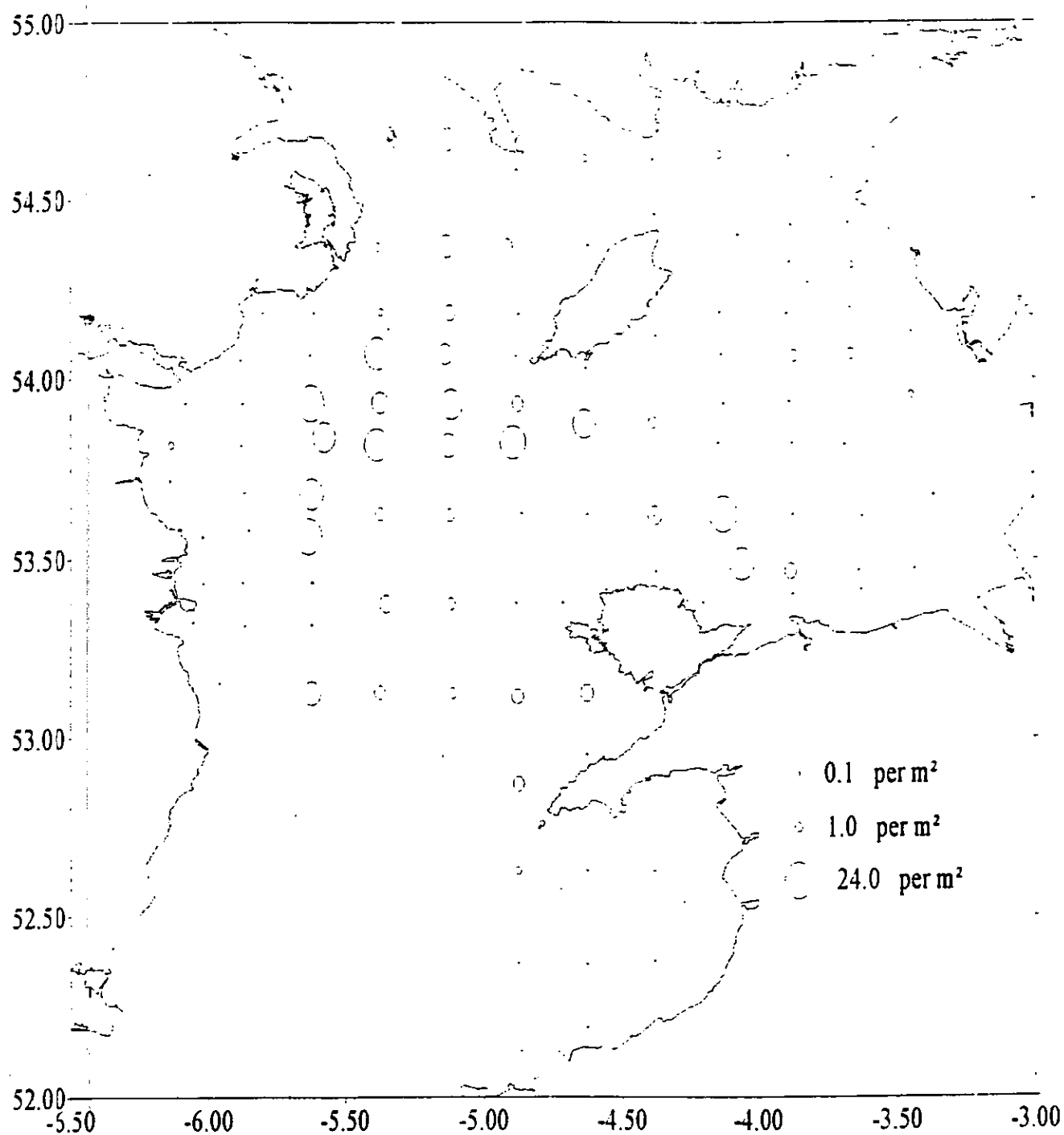


Figure 4 Euphausiids per m² in April on LF3295

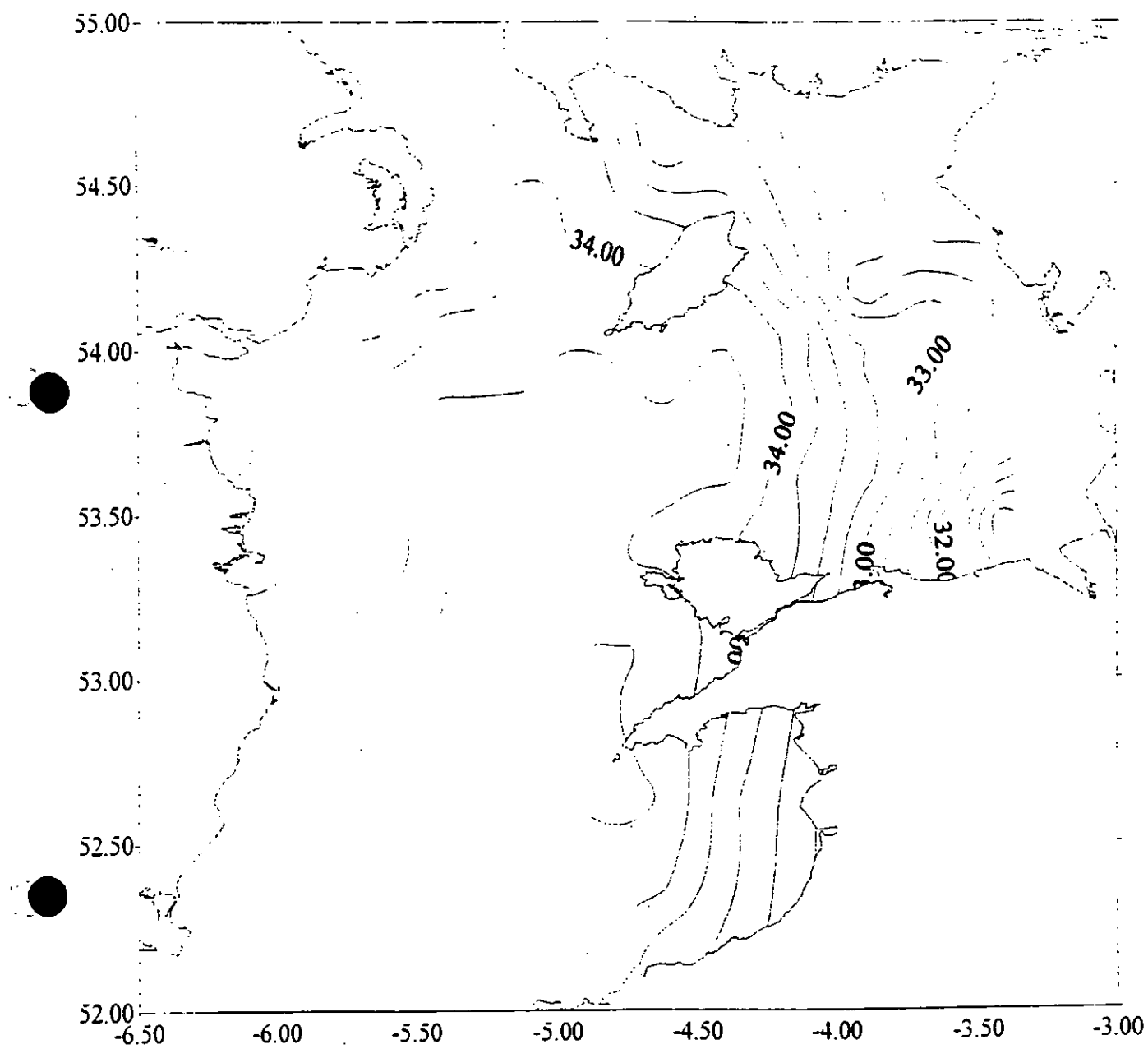


Figure 5 Median salinity (ppt) of the water column in April 1995 on LF3295

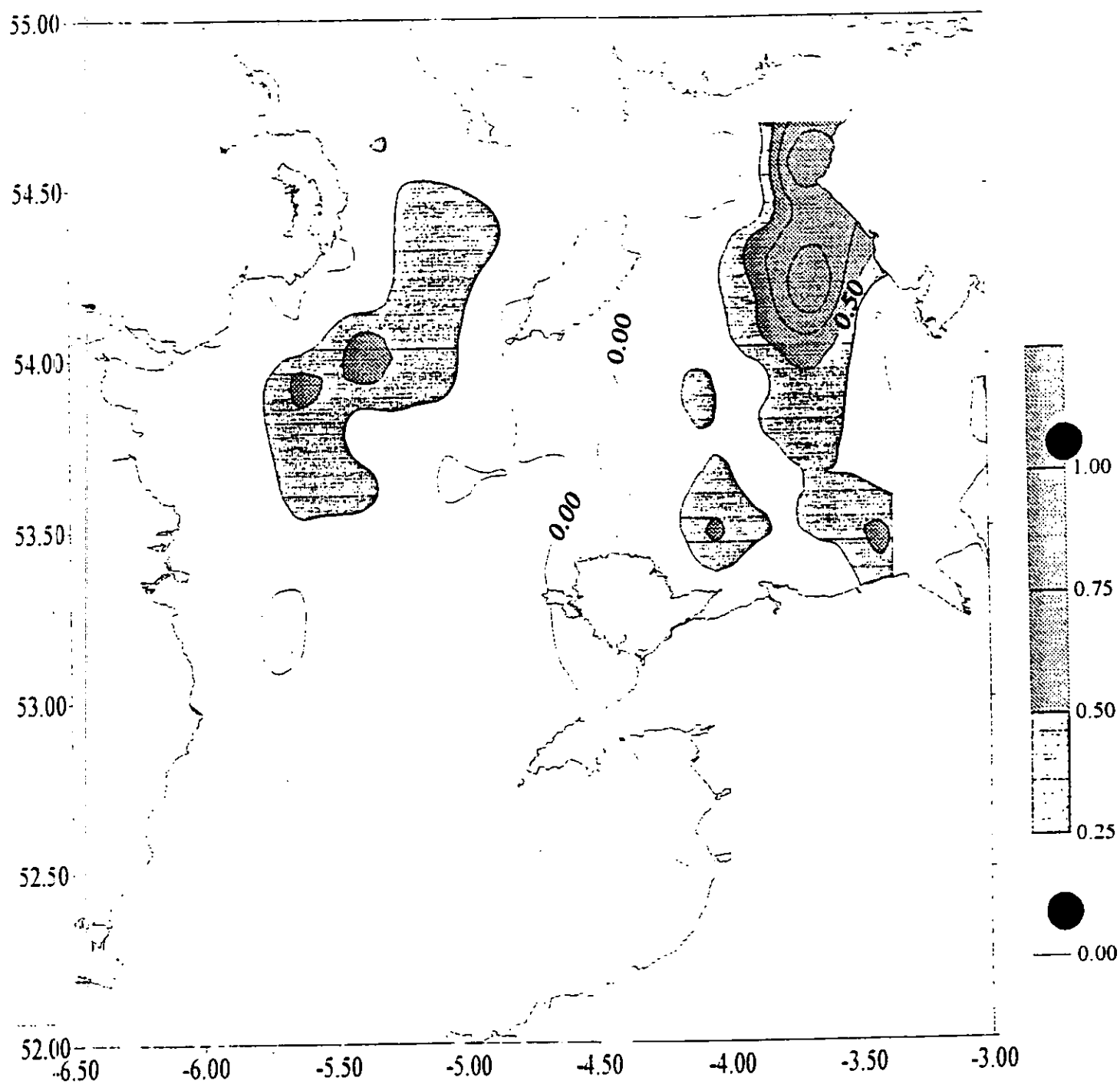


Figure 6 Difference in bottom to surface salinity (ppth) in April 1995 on LF3295

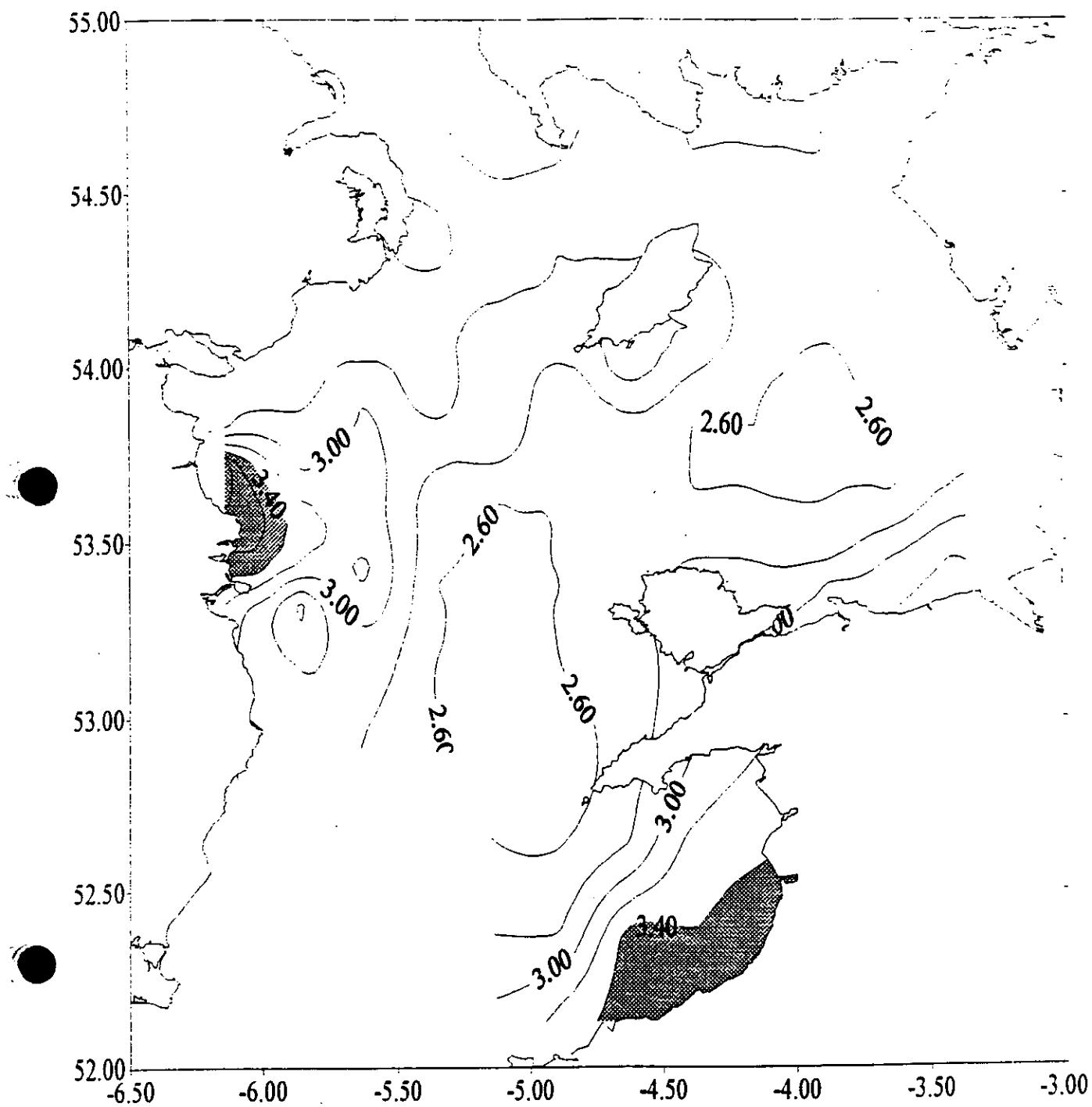


Figure 7 Median fluorescence of water column, relative values, in April on LF3295