

**Cruise Report:** LF4598 Larval Herring Survey

**Vessel:** RV *Lough Foyle*

**Dates & area:** 1 - 5 November 1998 in the Irish Sea (north); ICES div. VIIa

<b>Personnel:</b>	Mark Dickey-Collas	DANI	SIC/SSO
	Richard Briggs	DANI	PSO
	John Peel	DANI	ASO
	Michael McAliskey	DANI	SO
	Deirdre Brophy	UCD	Post graduate student
	Brett Danilowicz	UCD	Lecturer

### Objectives:

1. To survey the distribution and abundance of herring larvae from the Manx and Mourne Irish Sea stocks, to produce a larval production estimate (index) and provide data on larval drift.
2. To investigate the abundance of euphausiids and other macrozooplankton in the Irish Sea.
3. To collect samples for UCD projects on larval herring genetics and otolith microstructure.

### Cruise narrative

Sunday 1 November 1998

All scientific crew were onboard by 21:30, and the ship sailed for station 59 at 22:30 (Figure 1). A full safety drill and demonstration were carried out.

Monday 2 November 1998

11 stations were sampled successfully as the vessel headed east across the Irish Sea. However during the deployment at station 12.2 the sampler was lost. No excessive stress was being experienced by the sampler at the time and it appeared that the termination on the winch cable had failed. The sampler was lost at 10:22, near the surface (5m, Figure 2) at 54° 24.927' North, 3° 44.906' West. After the loss, the ship headed immediately for Belfast as conditions were not suitable for a search for the sampler. The ship reached Belfast at 17:30. An eye was inserted on the end of the winch cable and an alternative sampler, without real-time monitoring, was loaded onto the ship for further use.

Tuesday 3 November 1998

A prawn net was loaded onto the vessel to aid the recovery attempts of the lost sampler. Due to poor weather conditions, the vessel did not sail till 20:00. The ship headed to the eastern Irish Sea again.

Wednesday 4 November 1998

15 stations were sampled with the alternative plankton sampler. Then at 12:00 recovery of the lost sampler began. The sampler was recovered at approximately 13:30 by trawling with the prawn net. It was virtually complete and appeared to have suffered only minor damage. The cable termination was still complete and attached to the Gulf. Only the drogue was lost during the recovery. A further 12 stations were sampled in worsening weather conditions.

Thursday 5 November 1998

Three more stations were sampled before 02:00 in the eastern Irish Sea. As the quality of the weather was continuing to decline the ship headed for shelter off the east coast of Ireland. In worsening sea conditions 3 stations near the Mourmes were sampled. The ship went over a fixed net off St John's Point and a Furuno bomb was lost. The ship docked in Belfast at 18:30.

### Methods

A redesigned sampling grid was used to account for likely distributions determined from previous surveys. At each station the high speed plankton sampler was deployed to 4m off the sea bed. At the first 11 stations, the temperature and salinity of the water column were monitored with the Pronet system. After that, mechanical flowmeters were used and the water surface temperature was manually read from water samples taken on the Bridge. At stations with extremely high catches of herring larvae (>1000), a further sample was taken in an attempt to reduce the variance of abundance estimates.

The plankton samples were sorted and all the fish removed and identified. The herring larvae were measured to the nearest 0.1mm and then fixed in 99% ethanol or frozen for later analysis by UCD. The remaining macrozooplankton were sorted from the plankton samples, identified and weighed to the nearest 0.1g, and then returned to the main sample. The plankton samples were then fixed in 4% buffered formaldehyde and stored.

### Results

Over 3.3 million litres of sea water were sampled during the cruise. As in previous years larvae were found to the north of the Isle of Man (Figure 3). These larvae were very small and their presence could suggest a more northerly spawning site for herring

in the Irish Sea. A further patch of larvae were found off Douglas. The survey encountered a very high density of yolk sac larvae (1972 per m<sup>2</sup>), very close to Douglas Bay, suggesting that a spawning event had been sampled. No larvae were found in the western Irish Sea.

### Discussion

Despite the early setbacks, the cruise was a success. A good estimate of larval production will be possible. The Mourne herring does not appear to be making a recovery. In the eastern Irish Sea, the size of the larvae and the encounter with a spawning event, suggests that previous reports of later spawning is correct. There may also be a substantial herring spawning off the Scottish coast. Confirmation of this would require further research.

With the new survey design and the additional resampling of high outlying samples, the production and abundance estimate should be more robust. Further analysis of this series will be carried out over the next few months.

### Acknowledgments

As with most marine fisheries cruises this Autumn, the weather was very poor. This, combined with the early loss of the real-time monitoring plankton sampler, ensured that the cruise was difficult for scientific staff, officers and crew. Work on the *Lough Foyle* in rough seas is not pleasant, and yet a successful survey was carried out. In addition the lost sampler (estimated value £35,000) was recovered with Mr. P. Scott as fishing skipper. Hence the officers and crew of the *Lough Foyle* must be heartily thanked for their hard work and commitment, and the scientific staff must be commended for their determination to see the job through in a professional and very competent manner.

Signed

SIC: Mark Callan

Date: 6 Nov. 1998.

Master:



Date: 5 XI 1998.

Section Head:

Date:

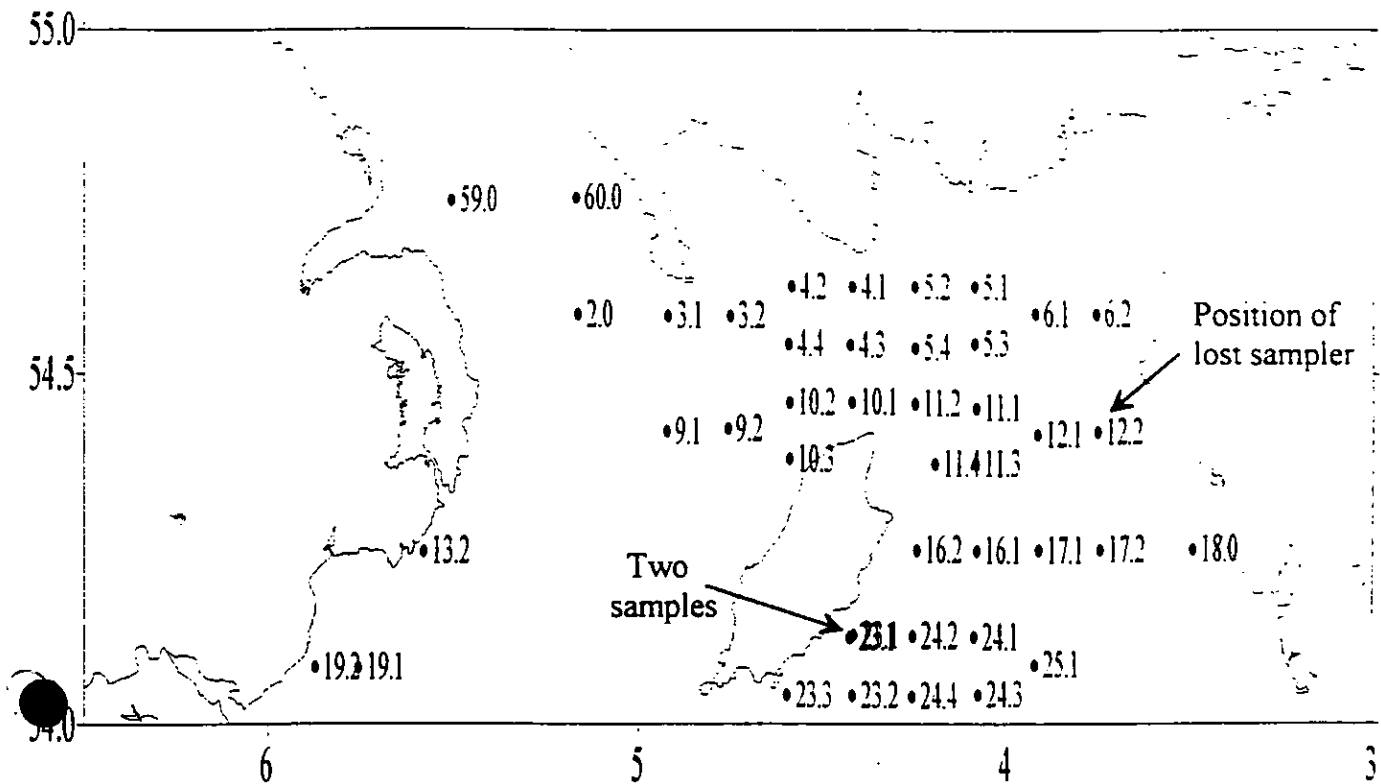


Figure 1. Stations sampled on LF4598, 1-5 November

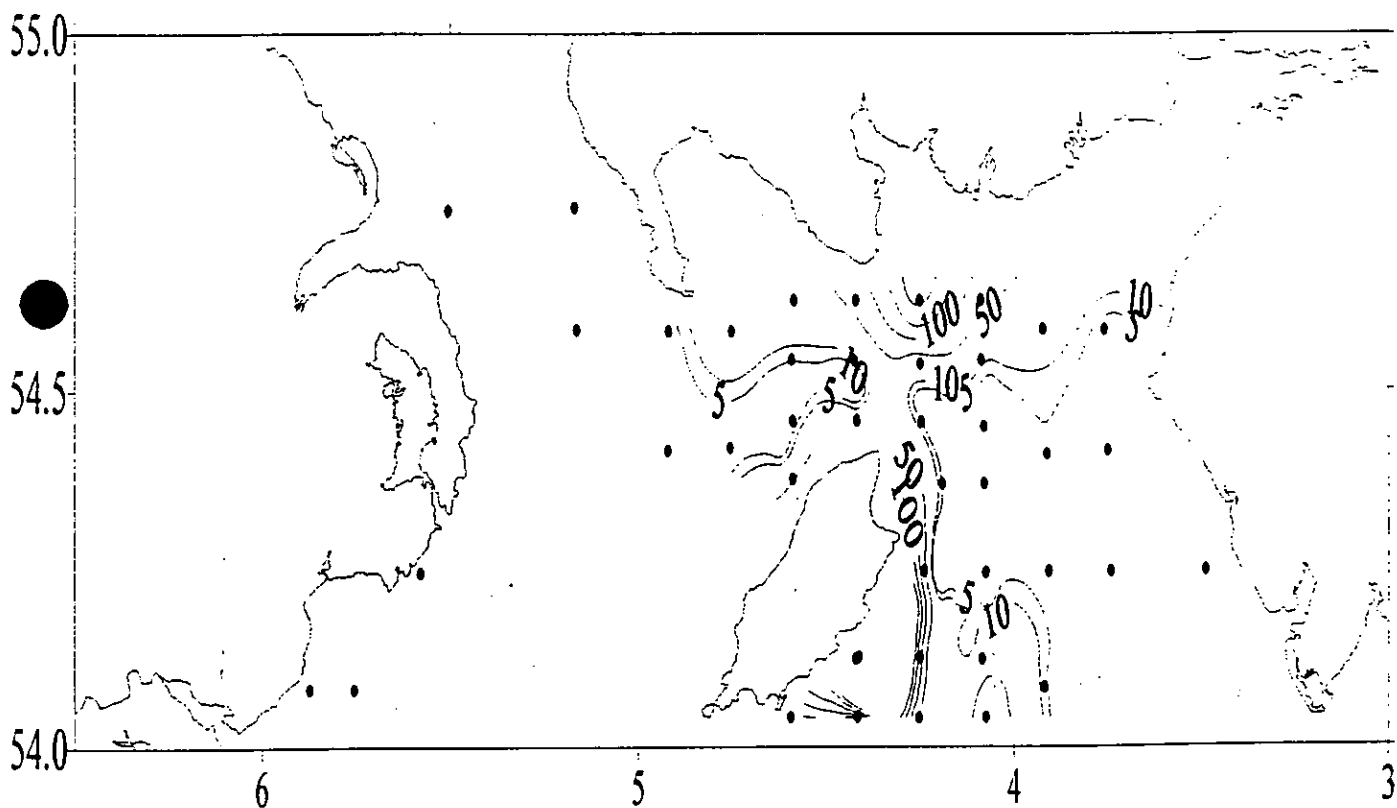


Figure 3. The abundance of herring larvae per m2 during LF4598.

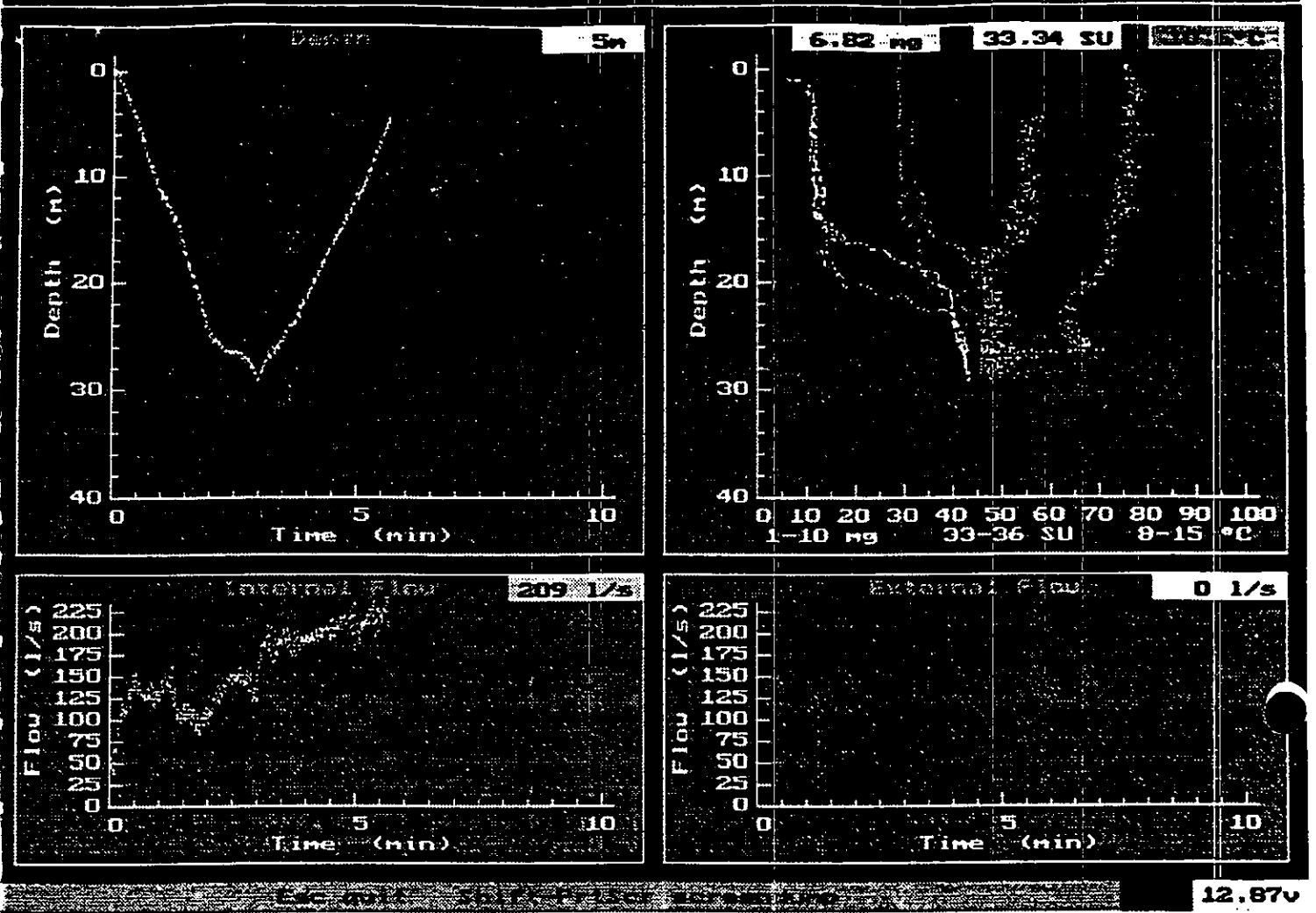


Figure 2. The deployment profile of Haul 12, when the sampler was lost.

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