DEPARTMENT OF AGRICULTURE FOR N. IRELAND
AQUATIC SCIENCES RESEARCH DIVISION

CRUISE REPORT: CRUISE LF/06/93: HERRING PRE-RECRUIT ACOUSTIC SURVEY

VESSEL: R.V. *Lough Foyle* (DANI)

DATES: 22 Feb -25 Feb 1993

AREA OF OPERATION: Irish Sea (West); ICES Division VIIa

TYPE OF SURVEY: Acoustics / midwater trawling

PERSONNEL:

M. Collas	HSO (S.I.C.)
M. Armstrong	SSO
W. Clarke	SSO
C. Reavey	SO
C. Burns	ASO
J. Milne	(DOM)

OBJECTIVES

1. To determine the distribution, size composition and biomass of sprat and juvenile herring in the Western Irish Sea, during late February.
2. To compare and contrast the results of day and night surveys.
3. To attempt to identify adult cod during acoustic surveys.
4. To test the new design of calibration rig.
5. To further improve acoustic survey methods on *Lough Foyle*.

METHODS

A sphere-calibrated EY-200 echo-sounder and a 38-kHz transducers (Nos. Tr 22317 and Tr21994)) mounted in a towed body were employed to carry out echo integrations along three transects in the Western Irish Sea (see Fig. 1). It was intended to carry out four transects but this was prevented by the weather and equipment failure. The transects were surveyed twice, once during the night and once during the following day. Acoustic targets were identified by means of aimed tows of a midwater trawl fitted with a 10-mm sprat brailer and a Furuno netsonde.

Acoustic data was digitized and stored using the Hadas echo-integration software. Data were stored on 40 MB cartridges. Further data (trawl stations, species catch composition and length-frequencies

of fish from all trawl catches) were stored on 3 inch disks. The transducer was to be calibrated when calm sea conditions prevailed.

Subsamples of herring and sprat were frozen for later stomach content analysis in the laboratory.

CRUISE NARRATIVE

Sunday 21 February

W. Clarke, C. Reavey and C. Burns boarded vessel in the afternoon to assemble the sonar equipment and rig up the towed body and transducer.

Monday 22 February

The remaining staff boarded by 09h.30, and the *Lough Foyle* departed Belfast harbour at 10h.04 for Dundrum Bay. The Fishing Master gave a comprehensive demonstration of safety procedures and gear. Whilst heading South, the vessel stopped to allow the towed body to be tested in the water. At 16h.30, the vessel reached Dundrum Bay, but the sea condition was to rough to carry out a successful calibration, so the *Lough Foyle* continued south to the start of the first transect, at 53°35′ North, 06°01′ West. The night survey of transect 1 began at 20h.45. One trawl (No.1) was taken that evening.

Tuesday 23 February

At 01h.22, the vessel stopped to allow the alkathene-covered transducer cable to be resecured to the hydrographic wire. The transect ended at 03h.44 and trawl 2 was carried out on very sparse scattering layers. The day survey of transect 1 started at 07h.09 and two further trawls were taken, one aimed at the mid-water layers and the other at the bottom layer. On completion of the transect the vessel cruised to position for the night survey of transect 2.

Two trawls (nos 5 & 6), were made in the first half of the transect 2, the first caught herring close to the sea bed and the second was aimed at a mid-water scattering, which was juvenile whiting.

Wednesday 24 February

As time allowed, the transect was extended to 04°30′West. It was completed at 03h.53. The fish was then removed from the water and the cables checked. The day survey of transect 2 commenced at dawn, 07h.14. The first trawl was aimed at a mid-water scattering of whiting. The survey progressed but at 11h.58 the fish had to be removed from the water as the cable had become detached. The transducer was changed (to No. Tr21994) as the cable was damaged. The survey was resumed at 13h.55 and finished at 19h.30, after one further catch (no. 8) of sprat was made.

Transect 3 (night) began at 21:15. One trawl was taken on very dispersed scattering throughout the water column. The catch was very mixed in terms of species composition.

Thursday 25 February

The sea condition began to worsen, resulting in the bottom signal breaking up. So the ship stopped at 01h.20 to allow the fish to be lowered 1m further. This allowed the fish to swim better and the survey continued. However very few targets were detected and the sea state prevented trawling. The transect was completed off Port Erin (IOM) at 3h.47. The day survey of transect 3 began at 07h.15. The bottom signal was breaking due to turbulence and the fish was removed from the water at 08h.54. The protective covering of the transducer cable was found to be damaged. Due to transducer malfunction and the worsening sea conditions, the cruise was terminated at 09h.35 and the vessel changed course to head for Belfast harbour.

WORK COMPLETED

The survey successfully identified sprat and herring populations over the area covered, and completed two full day and night transects. One night transect from Annalong to Port Erin was also completed. All acoustic data was captured and digitized using the Hadas software, and stored on 40 MB disks. 38 echo integration files were collected.

Nine midwater trawl tows were completed for identification of acoustic surveys. The trawl positions are shown on Figure 1. Details of the tows are given in Table 1. The trawls highlighted the positions of distinct whiting and sprat/herring scatterings. Only one cod was caught.

Due to sea state, no transducer calibrations were made. The alkathene water piping protected the transducer cable to a limited degree. During the 4 days of survey the cable broke twice. This was thought to be due to the towing method and the worsening sea state. The towed body was towed from the port boom and supported on the hydrographic cable. More work is required to resolve this problem.

ACKNOWLEDGEMENTS

The Ship's Master, Officers, Fishing Master, Engineers, Catering Staff and Crew are thanked for their cooperation during this cruise. The scientific staff are also acknowledged for their dedicated hard work throughout the cruise.

Signed:

Scientist in charge..M. Collins..... date..18/3/93.

Ships master..... date.....

Division Head..... date..26/3/93

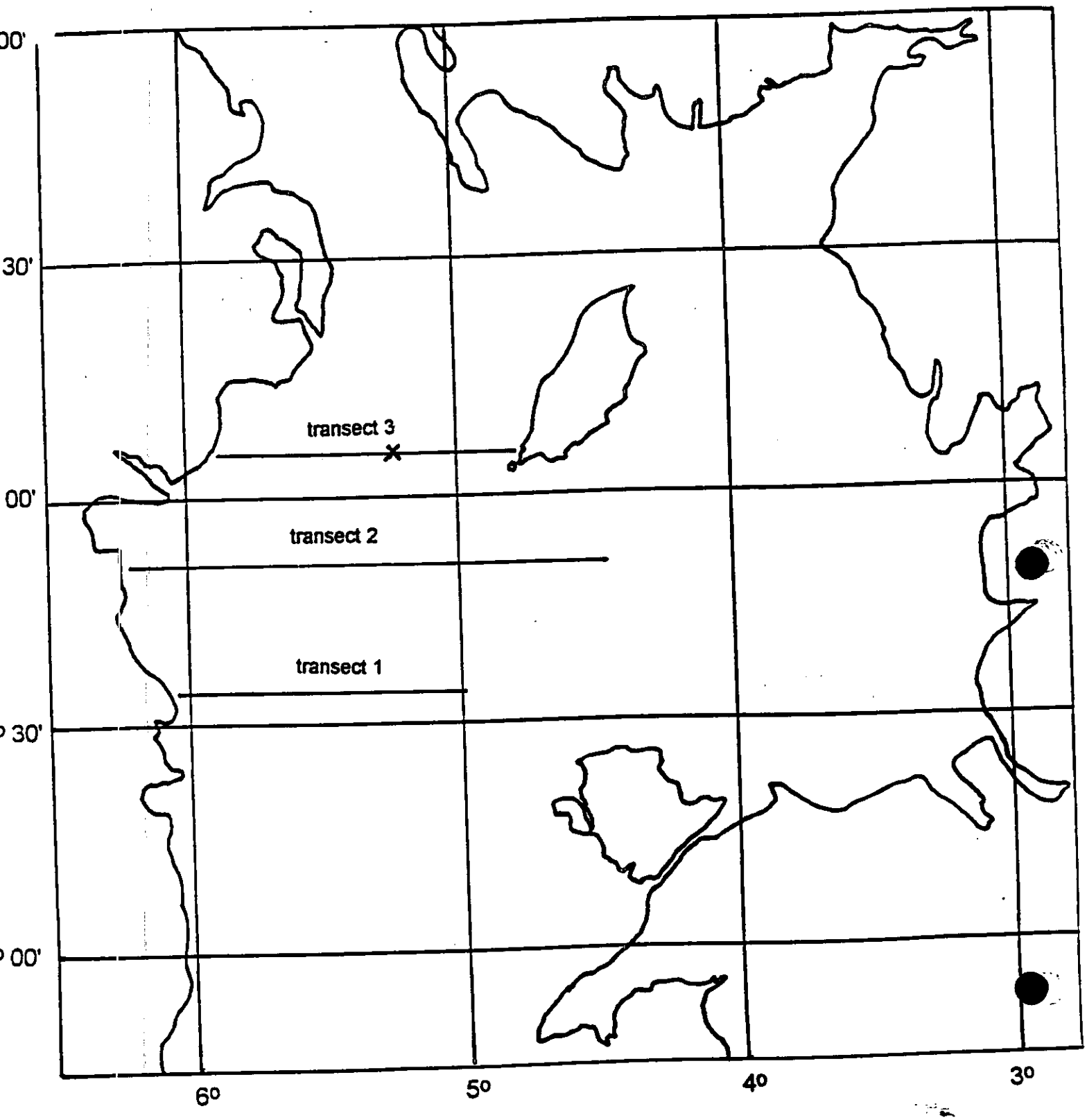

Figure 1 Transects made on research cruise LF0893 in the Western Irish Sea.
x denotes the position at which the day run of transect 3 was terminated

Table 1 Positions and durations of mid-water trawls taken during the research cruise LF0693, in the western Irish Sea.

Trawl	From				To				Duration (mins)
	°	'N	°	'W	°	'N	°	'W	
1	53	36.12	05	28.49	53	35.00	05	44.20	56
2	53	35.03	04	59.87	53	34.50	05	08.29	60
3	53	35.50	05	23.40	53	35.40	05	20.06	33
4	53	35.43	05	20.05	53	35.75	05	23.92	45
5	53	50.13	06	03.67	53	50.27	06	05.24	16
6	53	50.11	05	34.75	53	50.01	05	35.97	15
7*	53	50.06	04	47.75	53	50.12	04	48.03	42
8	53	50.03	05	48.84	53	49.50	05	46.15	30
9	54	04.93	05	22.04	54	05.32	05	24.49	50

* Trawl 7 turned back on itself.