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DEPARTMENT OF AGRICULTURE FOR NORTHERN IRELAND
AQUATIC SCIENCES RESEARCH DIVISION

CRUISE REPORT: CRUISE LF/12/94: PELAGIC FISH ACOUSTIC SURVEY

VESSEL: R.V. Lough Foyle (DANI)

DATES: 2 - 6 May 1994

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

TYPE OF SURVEY: Acoustics / midwater trawling / plankton sampling

PERSONNEL:	M. Armstrong	SSO	(DANI; S.I.C.)
	M. Dickey-Collas	HSO	(DANI);
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	C. Burns	ASO	(DANI).

OBJECTIVES

1. To locate concentrations of sprat and juvenile herring in the western Irish Sea and to investigate predation on zooplankton and ichthyoplankton relative to the densities in the water column as estimated using a Gulf-3 high speed plankton sampler;
2. To re-calibrate the EY-200 echosounder;
3. To try out the new Lebus towing winch.

WORK COMPLETED

An EY-200 echosounder and a 38-kHz transducer mounted in a towed body were employed to carry out echo integrations along transects in the Northwestern Irish Sea (see Fig. 1 for survey grid). The grid was designed to map the overall distribution of sprat and juvenile herring from the Mourne coast to Rockabill and was surveyed during daylight when the fish were in the lower water column. Sea conditions were not calm enough for sphere calibration of the echosounder to be carried out.

Three patches of sprat and juvenile herring were located for more detailed study (sites "A" - "C", Fig. 1). The fish and plankton were sampled at sites "B" and "C" during the afternoon, just after dusk and just before dawn. Site "A" was only sampled during darkness. Each sampling exercise comprised an echo-integration of targets, a midwater trawl and two successive Gulf-3 double-oblique hauls along the track of the trawl.

The Gulf-3 sampler was successfully deployed from the new Lebus towing winch, using a Furuno transmitter to monitor the depth of the net. The Methot-Isaacs Kidd frame trawl was deployed in the afternoon and evening at site "B", again using the Lebus towing winch.

Acoustic data were digitized and stored using the Hadas echo-integration software.

Species compositions and length-frequencies were recorded from all trawl catches (Table 1). Samples of sprats, herring and juvenile whiting were taken for stomach content analysis. Part of each sample was preserved in formalin and another part was frozen. Plankton samples were preserved in formalin. Some larvae were preserved in alcohol for growth analysis. Samples of euphausiids were also preserved for population analysis.

CRUISE NARRATIVE

Monday 2 May

Lough Foyle departed Belfast and proceeded overnight towards Dundrum Bay.

Tuesday 3 May

Conditions were too rough for calibration. Acoustic surveying commenced on a transect off Dundrum Bay at 07h.20 but was terminated due to excessive aeration under the transducer. The vessel then dodged southwards towards Dundalk Bay. By the evening the sea had calmed sufficiently for acoustic surveying to recommence on transect #2. A midwater trawl and two Gulf-3 hauls were made from 22h.00 onwards at experimental site "A" about 10 miles east of Drogheda on transect #3 (Fig. 1; see Table 1 for details of trawl catches). The vessel then remained in the vicinity of the trawl station until early morning.

Wednesday 4 May

A second trawl and two Gulf-3 hauls were made at about 3h.30 onwards at site "A". Acoustic surveying recommenced at 10h.00 on transect #3. A band of sprat targets was recorded around the 70m contour. Trawl #3, two Gulf-3 hauls and a MIK net haul were completed in the afternoon in the vicinity of these targets on transect #4 at site "B" (Fig. 1). Surveying of transects 4 and 5 was then completed. Site "B" was then revisited to carry out the cycle of fish and plankton sampling after dark.

Thursday 5 May

A third set of acoustic data, trawl and Gulf-3 samples was collected at site "B" between 3h.00 and dawn. The vessel then proceeded inshore to the start of transect #6 off Dundalk Bay, commencing surveying at 9h.15. On completion of transects 6, 7 and 8 the vessel proceeded southwards to locate an area of fish concentrations in approx. 70m of water on transect #6 (site "C"). Site "C" was sampled (echo integration, midwater trawl and Gulf-3) in the afternoon and again after dark.

Friday 6 May

Site "C" was sampled a third time just before dawn. The vessel then returned to Belfast.

PRELIMINARY RESULTS

The sampling for cruise objectives 1 and 3 was successfully attained. Sprat and herring were sampled at each trawl station for analysis of stomach contents on shore. The distribution of these species within the area surveyed appeared more limited than in previous acoustic surveys, and densities were low. A dense sound scattering layer of plankton was present in inshore waters. Large samples of zooplankton (mainly copepods) were collected using the Gulf-3 sampler which was deployed easily from the Lebus winch. Fish larvae were common in the plankton samples.

The Methot-Isaacs Kidd net required an excessive time to reach the lower water column, and modifications to the depressor will be required before further use.

ACKNOWLEDGEMENTS

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

Signed:

Scientist in charge..... *M. J. Arthur* date..... *6.5.94*

Ships master..... *AM Stoddart* date..... *6.5.94*

Division Head..... *S. J. Kearney* date..... *9.5.94*

Table 1 Details of midwater trawls in survey LF1294 (May 1994).
 Depths given are averages during each tow and are the depths
 below the ship's transducer.

Date	Tow No.	Expm't. Site	Time	Shooting posn.		Hauling posn.		Sounding (m)	Headline depth (m)	Fish catch (Kg)			
				Lat.	Long.	Lat.	Long.			Herring	Sprat	Whiting	Other
3 May	1	A	22h.00	53 43.4	5 57.8	53 43.7	5 59.4	35	10	2.68	.09	.24	.48
4 May	2	A	03h.20	53 43.7	5 58.8	53 43.2	6 00.6	31	10	3.27	.12	2.86	.54
	3	B	13h.30	53 34.8	5 45.0	53 34.5	5 41.2	76	58	15.64	6.72	.22	4.43
	4	B	23h.15	53 34.8	5 42.1	53 34.8	5 44.3	75	10	.04	1.98		.58
5 May	5	B	03h.15	53 34.8	5 45.4	53 34.9	5 42.8	72	12	.28	5.41	3.69	
	6	C	16h.50	53 47.9	5 43.6	53 49.4	5 43.3	70	55	11.3	2.71	.6	1.31
	7	C	22h.25	53 47.8	5 44.0	53 49.0	5 43.5	71	8	.69	.62	2.5	.13
6 May	8	C	03h.30	53 48.2	5 43.9	53 49.7	5 43.4	70	8	2.27	.66	2.15	.3

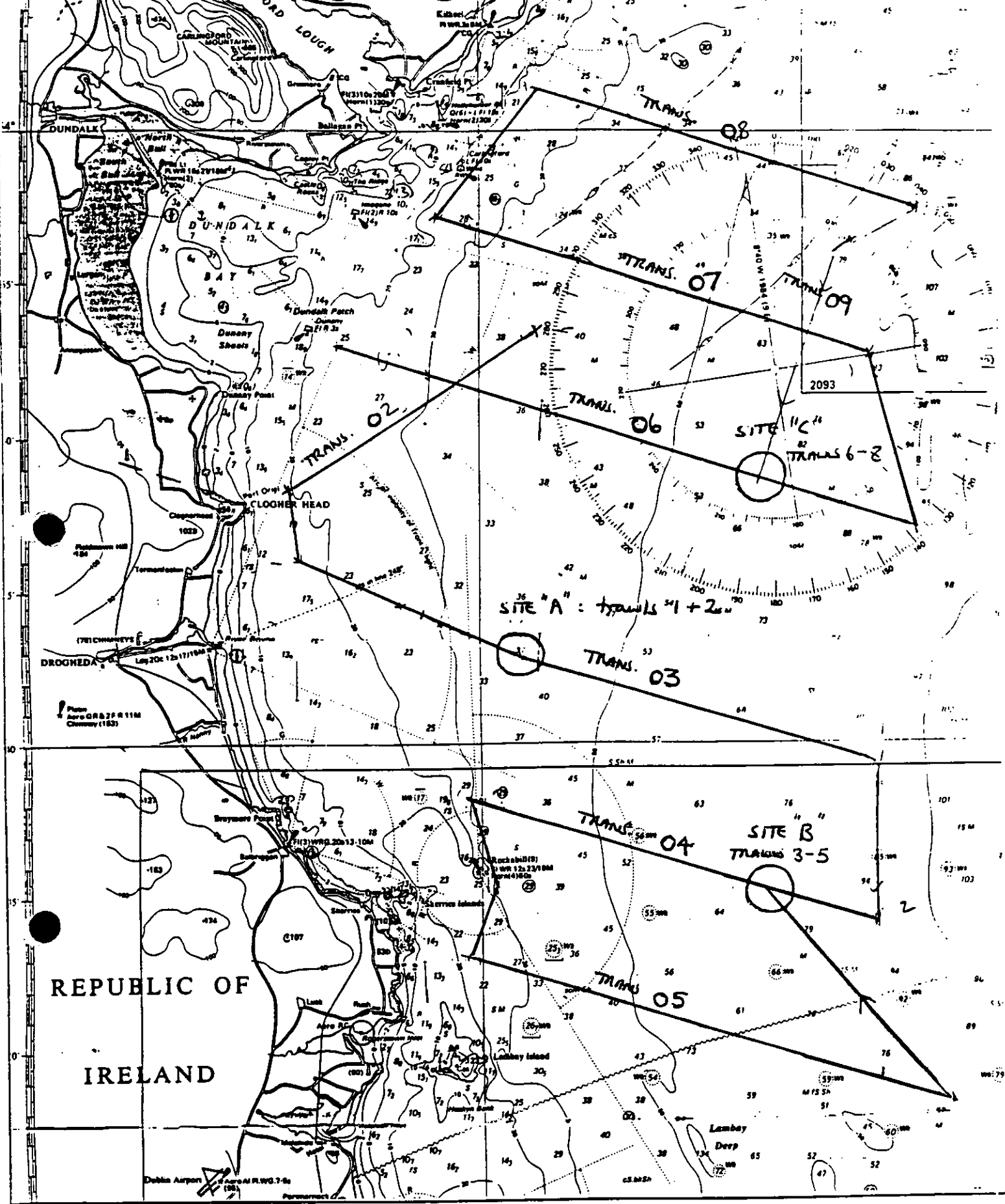


Figure 1. Survey transects and experimental sites "A" - "C" during cruise LF1294. Transects are numbered in the order in which they were surveyed. Transect 01 (off Dundrum Bay) was abandoned due to rough sea conditions and is not shown.