

CRUISE REPORT: CRUISE LF1297 DEMERSAL FISH SURVEY

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

DATES: 18 March - 1 April 1997

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

TYPE OF SURVEY: Otter trawl

OBJECTIVES

1. To obtain information on spatial patterns of abundance of different size- and age-classes of demersal fish in the northern Irish Sea.
2. To obtain indices of abundance of whiting, haddock, cod and herring for use at ICES Working Groups.
3. To quantify external parasite loads in whiting and cod, by area.
4. To collect samples of flatfish for contaminant analysis and feeding studies.
5. To record quantities of marine litter in trawl catches.

PERSONNEL

M. Armstrong	DANI	(SIC)
C. Burns	DANI	
M. Dickey-Collas ¹	DANI	
M. McAliskey	DANI	
W. McCurdy	DANI	
J. Peel	DANI	
N. Bunn ²	QUB	

¹ Embarked 24 March

² Disembarked 24 March

METHODS

A commercial Rockhopper trawl fitted with a 20 mm (stretched mesh) liner in the cod-end was towed over three nautical miles where possible at the stations shown in Figure 1. Gear and towing procedures were those employed on all previous DANI groundfish surveys. A stratified survey design with fixed station positions was employed. The survey area was divided into seven strata defined by depth and substratum, as shown in Fig. 1.

The species composition of the catch at each station was determined, and length-frequencies were recorded for each species. Subsamples of cod, whiting, haddock and hake were taken for recording length, mass, sex and maturity stage, and for removal of otoliths for ageing. The level of infestation of whiting and cod by external parasites was estimated from the length-frequency samples collected at each

station Samples of up to 50 of the largest dabs at each station were frozen for contaminant analysis. Samples of different species of flatfish were also collected for a feeding study at Port Erin Marine Laboratory. Quantities of different types of marine litter in each trawl catch were recorded.

CRUISE NARRATIVE

Monday 17 March

R.V. *Lough Foyle* departed Belfast Harbour at 22h.35 and proceeded overnight to station 83 (Fig 1)

Tuesday 18 March

Six trawl stations were completed (83, 81, 101, 99, 46 and 97) in 18 - 35 mph SW to S winds, after which the vessel was anchored in Dundrum Bay for the night.

Wednesday 19 March

Trawl stations 100, 17, 70, 88 and 216 were completed in moderate to light NW winds. The vessel then drifted off the SW coast of the Isle of Man.

Thursday 20 March

Trawl stations 96, 51, 48, 77 and 102 were completed in light to moderate westerly winds. The vessel then drifted overnight off the north coast of Anglesey.

Friday 21 March

Trawl stations 245, 246, 249, 243 and 76 were completed in calm conditions. The vessel then drifted near station 105 for the night.

Saturday 22 March

Six trawl stations were completed (105, 50, 103, 90, 208 and 71) in freshening southerly to south-westerly winds. The vessel was anchored off Dundalk Bay for the night.

Sunday 23 March

Trawl stations 73, 79 and 75 were completed. The vessel then proceeded to Dublin for the mid-cruise break.

Monday 24 March

In Dublin all day.

Tuesday 25 March

The vessel left Dublin during early morning. Trawl stations 94, 56, 93 and 92 were completed in moderate S - SW winds. Due to strengthening winds, the vessel was anchored overnight in Ramsey Bay (NE Isle of Man).

Wednesday 26 March

Sea conditions were found to be too rough for trawling, and the vessel returned to Ramsey Bay to shelter at anchor.

Thursday 27 March

The vessel proceeded during the morning to the Irish Coast, where stations 86 and 35 were completed. The *Lough Foyle* then returned to Belfast during the early evening.

Sunday 30 March

The vessel departed Belfast at 21h.42 and proceeded overnight to station 250.

Monday 31 March

Trawl stations 250, 259, 257, 258 and 242 were completed in moderate to light W - SW winds. The vessel then berthed at Douglas Harbour to offload frozen samples collected for Port Erin Marine Laboratory, departing again around 23h.30.

Tuesday 1 April

Stations 64, 256, 63 and 61 were completed in light to moderate SW winds. The vessel then returned to Belfast, berthing during early evening.

WORK COMPLETED

A total of 45 hauls were completed, with none lost due to gear damage or other factors (Fig. 1). Positions of trawl stations are given in Table 1. The trawl gear fished well throughout the survey. The width of seabed swept by the trawl doors increased from around 35m in shallow water (30m sounding) to around 45m in deeper water (80m sounding), with variations due to tidal flow. An average headline height of 2.5 - 3.0 m off the seabed was recorded.

Length measures were carried out on all fish species at each station. Catch weights were recorded for most invertebrates. In addition, a total of 390 cod, 1086 whiting, 530 haddock and 53 hake were analysed for length, mass and maturity. Otoliths were taken from each of these fish for ageing. Each cod and whiting sampled for age was inspected for external parasites. The cod and whiting length frequency samples were also screened for parasites. A record was kept of quantity and type of marine litter in each catch. A sample of up to 50 of the largest dabs at each station was frozen for contaminant analysis. A sample of the remaining dabs and the other flatfish species was frozen for a feeding study at Port Erin Marine Laboratory.

Trawl data and length frequencies were archived using the groundfish survey data base.

PRELIMINARY RESULTS

The overall catch-rates of selected species are given in Table 2. Length distributions of whiting in selected survey strata are shown in Figure 2. Length compositions of whiting, cod and haddock averaged over survey strata are shown in Fig. 3. Catch rates of whiting and haddock above the minimum landing size (MLS) are shown in Table 3.

The substantial growth of the haddock stock during the 1990s, which has been followed closely during this survey series, has continued into 1997. Catch rates of haddock above the MLS were higher, on average, than recorded in March 1996, and were dominated by fish of the very strong 1994 year class. Spawning by haddock was widespread. The 1996 year class of haddock, which gave very high catches of 0-year-olds in the September 1996 survey, was apparent as 1-year-old fish of 12-24 cm in length in the present survey (Fig. 3). Relatively high catch-rates of this year class were recorded over a wide area of the western Irish Sea. As in previous surveys, the bulk of the haddock catches were made in the western Irish Sea. Highest catch-rates of adult haddock were recorded off the west and southwest coasts of the Isle of Man (stratum 4).

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As in previous surveys, the whiting catches were dominated by young fish with length modes at 15 and 23 cm (Fig. 3), with the highest catch-rates of adult fish recorded off the west coast of the Isle of Man (stratum 4) and in the eastern Irish Sea (stratum 6) (Table 3, Fig. 2).

Catch rates of 1-year-old cod (1996 year class) were generally poor over most of the survey area.

Data collected during cruise LF1297 will be incorporated in the stock assessments of Irish Sea cod, whiting and haddock at the ICES Northern Shelf Working Group in June 1997, and in the ICES assessment of herring in March 1998.

ACKNOWLEDGEMENTS

The Master and personnel of the *Lough Foyle* are thanked for their cooperation throughout the cruise and for ensuring efficient and consistent trawling operations. The scientific personnel are thanked for the very thorough work completed.

Signed:

Scientist - in charge: M. J. Armstrong date 1/4/97

Ships master: J. A. Hugh date 1/4/97

Head, AESD Aquatic Systems: S. J. Heaney date 7/4/97

Table 1 Details of trawls during cruise LF1297

(Time in G.M.T.)

Date	Station	Time abot	Shooting position		Hauling position		Mean Depth (m)	Distance towed (nm)
			Latitude	Longitude	Latitude	Longitude		
18-Mar	83	7h.17	54 23.2	5 17.7	54 20.2	5 16.8	86	3.0
	81	9h.28	54 15.3	5 24.7	54 12.5	5 24.0	47	3.0
	101	11h.25	54 7.8	5 20.2	54 4.8	5 20.2	97	3.0
	99	13h.40	54 5.2	5 3.9	54 7.8	5 1.1	78	3.0
	46	15h.24	54 10.8	4 58.7	54 13.4	4 56.0	81	3.0
	97	17h.24	54 17.7	4 53.8	54 17.4	4 59.0	93	3.0
19-Mar	100	7h.21	54 11.3	5 41.3	54 8.2	5 40.9	26	3.0
	17	9h.14	54 7.9	5 32.4	54 5.0	5 31.3	59	3.0
	70	11h.30	54 1.5	5 45.7	53 58.5	5 44.9	42	3.1
	88	13h.14	53 59.2	5 40.8	53 59.9	5 35.9	71	3.0
	216	16h.45	53 53.8	5 15.1	53 56.2	5 11.9	79	3.0
20-Mar	96	7h.09	53 49.6	5 5.2	53 52.3	5 6.4	70	3.0
	51	9h.06	53 51.4	4 58.3	53 53.7	5 1.6	73	3.0
	48	11h.19	54 0.8	4 59.6	53 57.8	4 58.2	52	3.0
	77	14h.01	53 48.6	4 44.5	53 50.8	4 41.0	81	3.0
	102	16h.04	53 46.8	4 40.8	53 44.0	4 38.8	58	3.0
21-Mar	245	6h.36	53 29.6	4 11.5	53 30.8	4 15.1	43	2.5
	246	9h.18	53 28.7	3 48.2	53 29.2	3 43.2	36	3.0
	249	12h.40	53 46.1	3 41.1	53 48.1	3 45.1	35	3.0
	243	14h.59	53 47.1	4 7.2	53 49.3	4 10.7	46	3.0
	76	17h.32	54 0.7	4 24.4	53 59.4	4 29.0	43	3.0
22-Mar	105	6h.41	53 43.2	5 6.8	53 40.8	5 6.8	74	2.7
	50	9h.07	53 46.0	5 20.1	53 43.3	5 22.4	82	3.0
	103	11h.14	53 36.1	5 23.5	53 33.3	5 25.6	87	3.0
	90	13h.45	53 36.2	5 41.4	53 39.2	5 41.9	82	3.0
	208	16h.06	53 46.8	5 46.3	53 49.8	5 46.6	58	3.0
	71	18h.19	53 53.5	5 52.6	53 53.0	5 56.7	40	2.5
23-Mar	73	7h.07	53 51.9	6 15.5	53 49.3	6 2.5	29	3.0
	79	9h.11	53 44.0	6 0.0	53 41.3	5 57.7	36	3.0
	75	11h.20	53 42.7	5 50.2	53 39.0	5 50.0	58	3.0
25-Mar	94	9h.13	53 22.3	5 45.9	53 25.1	5 47.4	74	3.0
	56	11h.15	53 29.9	5 40.0	53 30.9	5 44.4	74	3.0
	93	13h.09	53 29.5	5 49.5	53 32.5	5 50.2	57	3.0
	92	15h.01	53 36.1	5 50.9	53 37.9	5 54.9	54	3.0
27-Mar	86	12h.41	54 34.8	5 25.6	54 37.7	5 27.2	37	3.0
	35	14h.40	54 43.7	5 37.3	54 42.9	5 42.0	19	3.0
31-Mar	250	05h.40	54 3.6	3 37.4	54 6.3	3 40.0	33	3.0
	259	8h.00	54 15.7	3 42.5	54 18.5	3 43.0	38	3.0
	257	9h.45	54 23.6	3 44.4	54 26.1	3 46.2	30	3.0
	258	11h.56	54 21.6	3 56.7	54 18.8	3 56.0	41	3.0
	242	14h.25	54 7.1	4 2.7	54 4.4	4 1.8	41	3.0
01-Apr	64	5h.56	54 34.1	3 46.3	54 36.9	3 43.4	27	3.0
	256	7h.58	54 38.0	3 55.8	54 36.2	3 59.6	38	3.0
	63	10h.00	54 37.9	4 11.4	54 36.6	4 15.3	60	3.0
	61	12h.24	54 32.9	4 32.6	54 33.0	4 37.7	46	3.0

Table 2

Catches of selected species during cruise LF1297 in kg per tow, by survey stratum.

STRATUM 1	Stn. 35	Stn. 86	Stn. 83
Cod	5.80	18.10	1.70
Whiting	80.00	21.70	54.10
Hake	0.00	0.00	0.00
Haddock	7.40	8.90	1.10
Norway Pout	0.00	0.01	3.00
Poor cod	0.20	0.80	2.60
Herring	1180.00	0.05	1.00
Sprat	0.00	0.03	0.10
Plaice	3.80	2.30	0.30
Dab	0.00	0.07	0.40
Flounder	0.00	0.00	0.00
Anglerfish	1.00	0.00	0.20
Gurnards	1.00	0.05	0.50
Less. sp. dogfish	0.80	15.10	2.90
Nephrops	0.00	0.00	16.80

STRATUM 2	Stn. 81	Stn. 100	Stn. 70	Stn. 71	Stn. 73	Stn. 79	Stn. 92
Cod	0.70	12.50	30.20	12.00	13.30	4.40	36.70
Whiting	134.10	159.40	123.20	117.70	152.80	120.60	497.50
Hake	0.50	0.00	0.00	0.00	0.00	0.00	0.00
Haddock	2.40	67.20	65.50	4.50	16.70	29.30	214.40
Norway Pout	11.30	0.02	13.70	1.50	0.00	0.10	21.40
Poor cod	1.00	0.00	0.10	0.10	0.04	0.03	0.00
Herring	235.90	140.20	55.50	62.40	246.20	208.10	15.80
Sprat	15.50	5.00	1.20	0.20	2.90	2.70	0.10
Plaice	1.10	83.20	4.10	8.20	103.10	164.90	26.40
Dab	0.90	80.10	25.40	81.80	87.90	111.11	11.10
Flounder	0.00	10.30	0.00	0.00	1.60	4.70	0.00
Anglerfish	0.00	0.00	1.00	0.50	0.00	0.00	0.50
Gurnards	0.10	0.40	0.40	0.50	0.30	1.10	46.40
Less. sp. dogfish	1.00	0.00	0.00	0.90	1.70	0.00	0.00
Nephrops	0.50	0.20	0.00	6.20	0.20	0.00	1.00

STRATUM 3	Stn. 101	Stn. 17	Stn. 88	Stn. 208	Stn. 75	Stn. 90	Stn. 56	Stn. 93	Stn. 94
Cod	1.50	2.60	12.40	3.00	26.40	24.80	8.00	22.60	4.70
Whiting	182.90	120.60	180.80	145.90	166.90	50.60	70.10	160.50	122.70
Hake	0.80	0.00	0.40	3.40	0.03	0.70	0.00	0.40	0.00
Haddock	18.50	125.40	68.70	56.80	147.20	2.30	9.10	158.30	73.10
Norway Pout	32.90	19.10	36.70	15.20	19.00	7.80	5.30	22.20	23.10
Poor cod	6.20	0.70	0.30	0.30	0.20	0.30	1.20	3.20	4.40
Herring	11.00	117.90	156.50	34.60	16.20	0.40	1.40	1.70	0.30
Sprat	0.20	1.60	0.50	0.20	0.05	0.60	0.40	0.30	0.03
Plaice	0.10	1.50	1.30	1.60	8.60	0.50	4.00	5.70	4.10
Dab	0.10	4.20	4.10	2.50	3.30	0.01	0.20	0.02	0.30
Flounder	0.00	1.20	0.00	0.00	1.00	0.30	0.00	0.00	0.00
Anglerfish	0.00	0.70	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Gurnards	1.23	0.50	1.30	7.60	36.40	1.00	0.40	1.00	0.10
Less. sp. dogfish	2.10	0.00	0.00	0.00	0.00	0.00	3.10	0.80	21.30
Nephrops	12.20	0.60	85.30	16.70	3.80	0.60	4.60	1.10	0.00

Table 2 continued

STRATUM 4	Stn. 97	Stn. 46	Stn. 99	Stn. 216	Stn. 51	Stn. 96	Stn. 50	Stn. 48	Stn. 103
Cod	11.30	2.20	3.90	2.30	33.80	11.40	0.00	14.30	0.00
Whiting	23.50	60.10	125.70	46.90	169.40	170.00	47.10	356.50	38.80
Hake	2.50	6.10	3.00	0.00	0.00	0.50	0.02	0.90	0.00
Haddock	10.70	18.40	152.10	37.30	508.90	218.50	6.20	196.10	36.40
Norway Pout	2.50	9.40	21.90	18.70	14.10	17.20	6.00	10.00	7.80
Poor cod	2.50	5.40	5.00	1.00	5.10	0.70	0.30	31.40	0.60
Herring	0.10	0.20	1.00	0.80	0.20	0.80	0.60	29.50	0.20
Sprat	0.20	0.20	0.00	0.02	0.10	0.08	0.10	1.60	0.30
Plaice	0.10	0.70	0.90	0.30	8.70	2.70	0.20	3.00	9.90
Dab	0.20	0.10	0.30	0.30	6.00	13.10	0.04	1.60	0.20
Flounder	0.00	0.00	0.70	0.00	0.00	0.00	2.00	0.00	1.90
Anglerfish	0.00	1.70	7.80	0.00	2.30	0.00	0.20	0.00	0.00
Gurnards	0.20	2.10	5.30	7.90	26.70	14.60	1.10	2.00	34.20
Less. sp. dogfish	2.60	1.60	3.10	0.00	7.00	0.00	0.01	101.70	0.00
Nephrops	6.60	23.30	44.60	19.30	7.40	27.40	3.20	0.00	0.30

STRATUM 6	Stn. 256	Stn. 64	Stn. 257	Stn. 258	Stn. 259	Stn. 242	Stn. 250	Stn. 249	Stn. 246
Cod	2.90	0.40	5.60	7.10	23.70	5.70	19.20	3.40	3.70
Whiting	44.40	150.50	95.20	427.30	131.90	1031.00	66.30	219.60	3052.00
Hake	0.00	0.00	0.00	0.00	1.10	0.00	0.00	0.00	0.00
Haddock	2.10	0.00	0.00	4.10	0.00	0.80	0.00	4.90	1.10
Norway Pout	0.10	0.00	0.00	1.00	0.80	0.00	0.02	0.10	0.05
Poor cod	1.20	0.10	0.30	0.70	2.30	0.60	0.50	3.00	4.30
Herring	13.50	5.90	21.00	3.90	2.70	125.70	2.40	0.70	549.00
Sprat	1.20	9.20	6.10	1.30	0.10	1.10	0.60	0.06	3.20
Plaice	10.90	20.20	9.70	60.30	8.40	42.30	9.40	7.40	154.20
Dab	5.40	20.00	5.40	15.60	13.60	12.70	101.60	48.10	38.70
Flounder	2.00	1.30	1.10	9.30	1.90	9.70	0.80	10.60	12.20
Anglerfish	0.00	0.00	0.10	0.00	0.00	0.00	0.00	0.06	0.00
Gurnards	0.80	0.60	0.20	0.50	0.10	1.80	0.70	0.20	0.50
Less. sp. dogfish	14.40	5.30	0.30	0.80	0.00	21.60	0.00	2.40	2.00
Nephrops	0.00	0.02	2.80	0.20	43.30	0.00	15.20	0.00	0.00

STRATUM 7	Stn. 105	Stn. 77	Stn. 102	Stn. 76	Stn. 243	Stn. 245
Cod	0.00	14.30	3.00	1.90	11.80	8.60
Whiting	60.30	56.60	39.10	11.20	27.60	14.80
Hake	0.00	0.00	0.00	1.60	0.00	0.00
Haddock	26.70	28.30	7.60	0.20	1.40	0.00
Norway Pout	2.90	0.20	0.06	0.03	0.20	0.04
Poor cod	0.40	3.00	1.40	5.50	3.60	2.50
Herring	2.30	0.10	0.50	29.80	69.60	0.10
Sprat	0.80	0.10	0.10	0.00	0.03	2.20
Plaice	9.50	4.10	*	5.70	3.10	9.30
Dab	0.80	0.45	0.90	0.00	2.15	0.60
Flounder	2.50	2.40	5.40	2.70	73.10	8.50
Anglerfish	0.00	3.10	0.00	0.00	0.00	0.00
Gurnards	7.80	21.10	30.90	19.90	2.40	0.30
Less. sp. dogfish	0.00	6.60	24.90	11.10	26.00	27.50
Nephrops	0.00	0.00	0.00	0.00	0.00	0.00

STRATUM 5	
Stn. 63	Stn. 61
65.20	11.50
64.40	1.10
0.00	0.00
33.00	0.60
0.04	0.00
6.50	0.30
39.50	12.20
0.06	0.00
3.50	0.10
0.20	0.00
1.50	0.00
0.00	0.00
0.80	0.20
41.00	17.10
0.00	0.00

* present but not weighed

Table 3 Catches in kg per 3 nautical miles (approx 1 hour) towed, for fish below and at or above the minimum landing size of 27 cm (whiting) and 30 cm (haddock) during cruise LF1297.

STRATUM	STATION	WHITING		HADDOCK	
		below MLS	above MLS	below MLS	above MLS
1	35	80.0	0.0	7.4	0.0
	86	17.6	4.2	8.5	0.4
	83	52.5	1.6	1.1	0.0
2	81	130.3	3.9	1.5	0.9
	100	140.9	18.5	37.8	29.4
	70	118.0	5.2	36.3	29.2
	71	112.5	5.2	2.0	2.5
	73	141.4	11.4	14.0	2.7
	79	109.1	11.6	27.6	1.6
	92	455.8	41.7	142.4	71.9
3	101	160.2	22.7	3.5	15.0
	17	109.0	11.6	3.4	122.0
	88	169.7	11.1	5.7	63.1
	208	133.7	12.2	8.7	48.1
	75	161.4	5.5	51.1	96.1
	90	50.3	0.4	2.3	0.0
	56	69.5	0.6	3.8	5.4
	93	149.6	10.9	90.2	68.1
	94	122.7	0.0	72.5	0.6
	4	97	16.5	7.0	0.9
46		49.9	10.1	1.6	16.8
99		97.3	28.4	17.2	134.8
48		245.5	111.0	68.8	127.2
216		42.2	4.8	1.7	35.6
51		141.7	27.7	56.1	452.8
96		139.8	30.2	12.8	205.7
50		46.1	1.0	4.1	2.1
103		31.6	7.2	12.1	24.3
5		63	49.3	16.1	26.2
	61	0.9	0.2	0.6	0.0
7	77	51.8	4.8	26.3	2.0
	102	35.7	3.5	7.6	0.0
	76	4.6	6.6	0.2	0.0
	243	23.3	4.3	1.4	0.0
	245	13.1	1.7	0.0	0.0
	105	58.0	2.3	4.1	22.6
6	246	2211.0	841.0	1.1	0.0
	242	794.6	236.0	0.8	0.0
	249	187.5	32.1	0.1	4.8
	250	53.5	12.8	0.0	0.0
	258	311.8	115.5	1.1	3.0
	259	104.3	27.6	0.0	0.0
	257	79.2	16.0	0.0	0.0
	256	37.6	6.8	2.1	0.0
	64	103.1	47.5	0.0	0.0
Mean: Strata 2 - 4		125.8	16.0	27.1	62.6

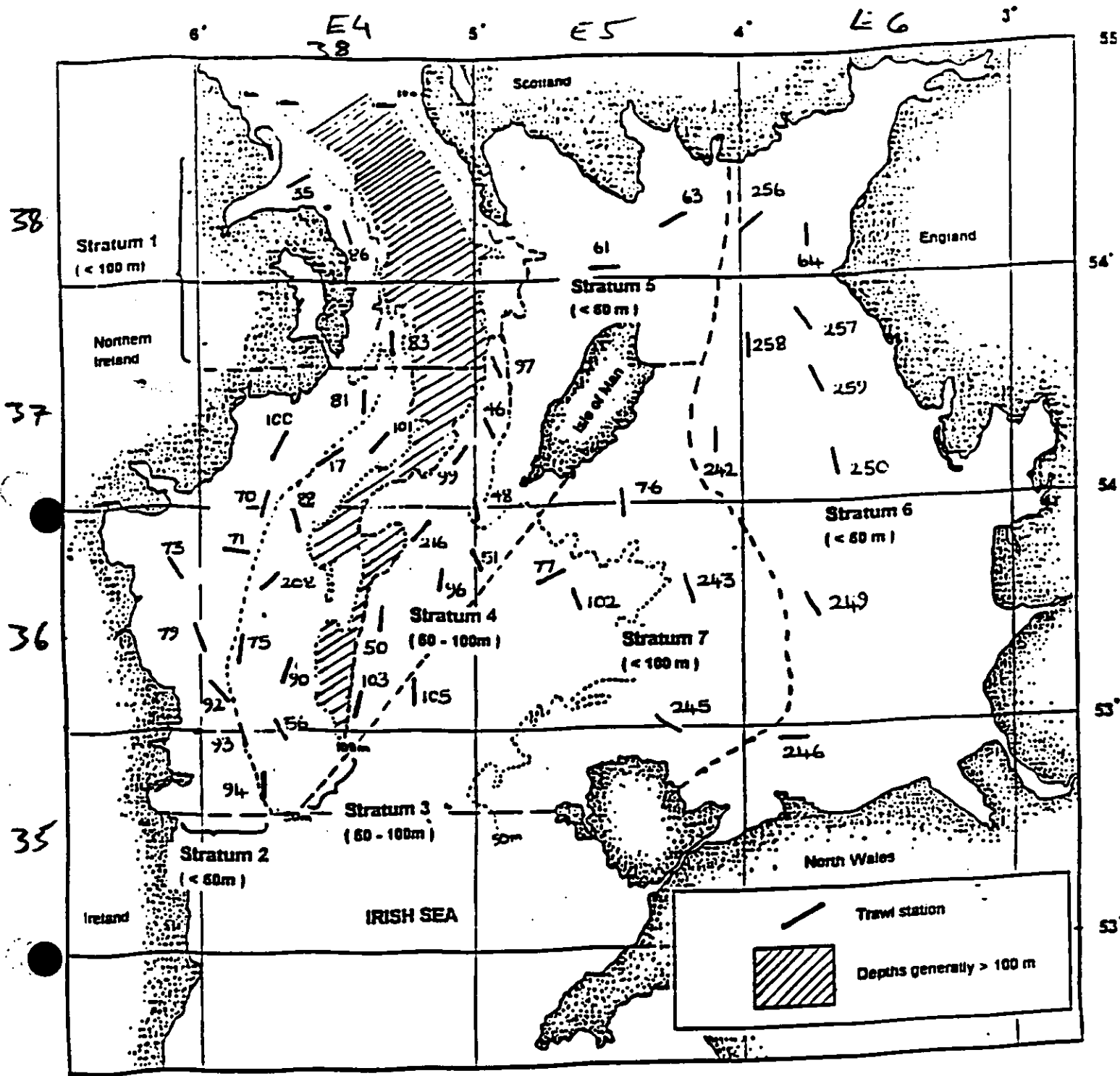


Fig. 1 Trawl stations fished during DANU R.V. Lough Foyle groundfish surveys

- Key to strata:
1. Irish coast (N), < 100m. Mixed sediments
 2. Irish coast, < 50m. Sand and finer sediments
 3. Irish coast, 50 - 100m. Muddy sediments
 4. W and SW Isle of Man, 50 - 100m Mud and muddy sand sediments
 5. N Isle of Man, < 50m. Gravel sediments.
 6. Eastern Irish Sea, < 50m. Sand and finer sediments
 7. S Isle of Man, < 100m. Gravelly sediments.

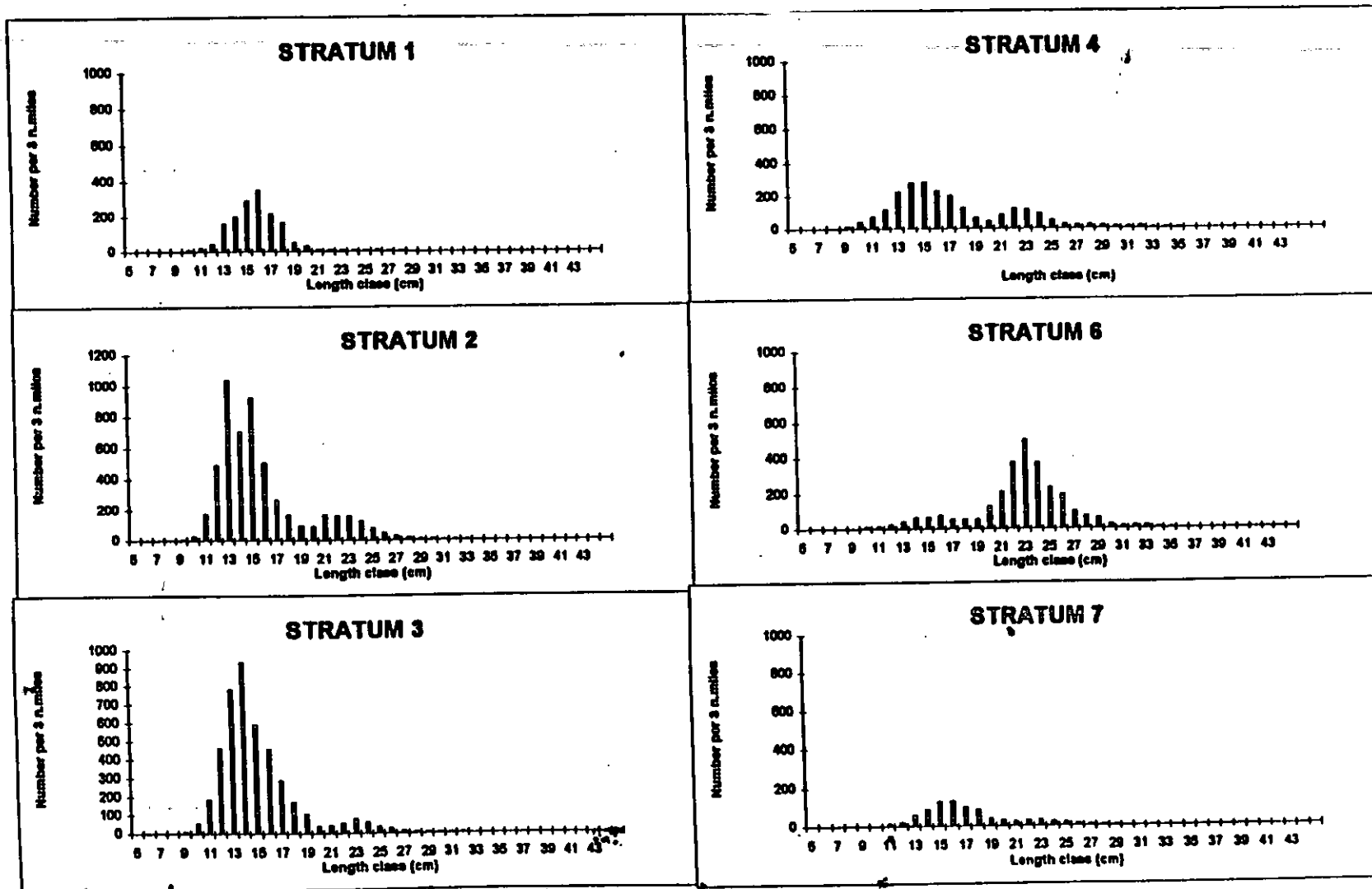


Fig. 2 Length distributions of whiting in strata 1 - 7 during LF1297. (Stratum 5 not shown)
 Data are mean numbers caught per 3 nautical miles towed.

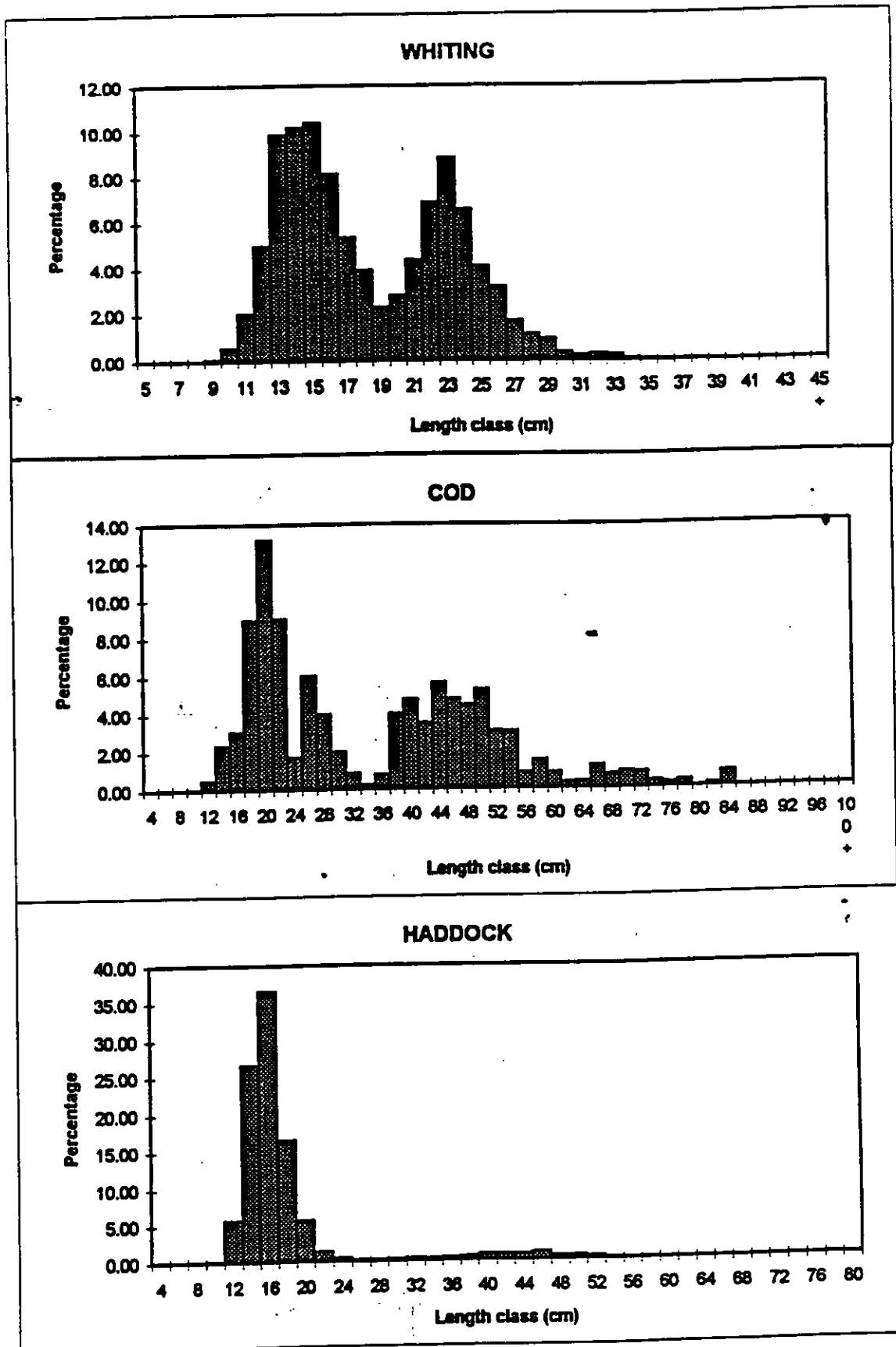


Fig. 3 Average percentage length compositions of whiting, cod and haddock during cruise LF1297