

NOT TO BE CITED WITHOUT PRIOR PERMISSION OF SCIENTIST-IN-CHARGE

CRUISE REPORT: CRUISE LF0592 DEMERSAL FISH SURVEY

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

DATES: 1 - 16 March

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

TYPE OF SURVEY: Otter trawl

OBJECTIVES

1. Obtain information on spatial patterns of abundance of different size- and age-classes of demersal fish in the northern Irish Sea during Spring;
2. Obtain indices of abundance of juvenile fish for use in future stock assessments, and to evaluate the utility of a Spring survey for providing indices of abundance of adult gadoids;
3. Determine the diet composition and feeding levels of predatory fish, and the spatial overlap of predators and their prey;
4. Map the distribution of cod eggs in the plankton;
5. Obtain information on distribution and relative abundance of cephalopods.

PERSONNEL

M. Armstrong (S.I.C.)	DANI	SSO
W. McCurdy	DANI	SSO
C. Burns	DANI	ASO
A. Hayes	DANI	ASO
J. Peel	DANI	ASO
B. Hart	DANI	ASO
D. Mulligan	DANI	TASO

METHODS

A commercial Rockhopper trawl fitted with a fine-mesh liner in the cod-end was towed for one hour or three nautical miles at the stations shown in Figure 1. Gear and towing procedures were those employed on all previous DANI groundfish surveys.

The catch at each station was sorted to species using a multiple-stage sampling procedure, and length-frequencies were recorded for each species. Subsamples of cod, whiting and hake were taken for recording length, mass, sex and maturity stage, and for

removal of otoliths for ageing. Samples of fish were taken for removal of stomachs which were then frozen for later analysis. All squid and cuttlefish caught were frozen for a project on cephalopods at the University College of Cork.

Immediately prior to each station, a CTD was deployed to record a vertical temperature and salinity profile. A Bongo net fitted with 300 micron mesh was then deployed vertically to estimate the abundance of cod eggs in the plankton.

For the purposes of analysis, the survey area was divided into seven strata defined by depth and substratum (Fig. 1):

Stratum	Region	Depth	Substratum
1	Ards Peninsula- North Channel	< 100 m	Mixed
2	Co. Down - Dublin	< 50 m	Sand and finer
3	Co. Down - Dublin	50 - 100 m	Sand and finer
4	IOM west coast	50 - 100 m	Sand and finer
5	North IOM	< 50 m	Coarse sediments
6	Solway Firth- Liverpool Bay	< 50 m	Sand and finer
7	Anglesey - IOM	< 100 m	Coarse sediments

Although the stations mostly utilize known trawl lanes, it is emphasized that they have a semi-random distribution within each stratum, with greatest emphasis on strata in the western Irish Sea.

CRUISE NARRATIVE

1-2 March: R.V. *Lough Foyle* departed Belfast harbour and proceeded overnight to the first trawl station (No. 61, NW of the Isle of Man), which was fished at 09h.25 on 2 March. Stations 61, 63, 256 and 64 were completed in moderate to rough sea conditions with 25 mph westerly winds. On completion of station 64 the vessel anchored off Ramsey on the Isle of Man.

3 March: Stations 258, 257, 259 and 250 were completed in moderate conditions with mainly clear skies, yielding catches of 200 - 500 kg of fish (mostly whiting) over the prawn grounds off Cumbria. Winds were SW, 12-20 mph. Overnight anchorage was again off Ramsey.

4 March: The vessel worked southwards towards the N. Wales coast, fishing stations 242, 249, 247 and 246. At station 246 a

large catch of 1500 kg of whiting and 300 kg of flatfish was taken, resulting in difficulties in bringing the codend on board. Conditions were initially rough, becoming calm in the shelter of Liverpool Bay. During the night the vessel anchored in Dulas Bay on the NE coast of Anglesey.

5 March: Stations 245, 243, 102 (new) and 77 were fished in southerly winds which strengthened during the day to reach 30 mph in the afternoon. Tow 102 was aborted after half an hour when the net fouled an obstruction on the seabed, suffering a minor tear in the side-panel. In the evening the vessel dodged between the Isle of Man and the Irish Coast.

6 March: Only three stations were fished (46, 99 and 48 off the west coast of the Isle of Man) due to deteriorating conditions with winds reaching 40 mph southerly by the afternoon. Anchorage was then found at the Skerries.

7 March: Shallow-water stations 79, 78, 89, 71 and 73 off Clogher Head were fished in good conditions with winds veering from light southerly to strong northwesterly in the afternoon. In the evening the vessel drifted off Dundalk Bay.

8 March: *Lough Foyle* returned to the area SW of the Isle of Man to complete stations 51, 96, 216, 50 and 103 (new) in fine conditions, after which the vessel dodged off the Irish Coast pending the following day's trawling.

9 March: The vessel worked southwards in strong southerly winds, completing stations 75, 92, 93 and 94. The CTD was not deployed after the first station because of the rough sea conditions. On completion of trawling at approx. 16h.00, *Lough Foyle* proceeded to Dublin to take on water and fuel, berthing at the North Wall, Alexander Basin, at 18h.30.

10 March: The vessel remained in berth throughout the day.

11 March: *Lough Foyle* departed Dublin at approx. 09h.00 after a delay caused by an engine fault and a fuel leak. Trawl stations 56, 90 and 208 were fished in 20-30 mph westerly winds. The vessel then proceeded northwards to an anchorage in Dundrum Bay.

12 March: The vessel remained at anchor throughout the day because of storm-force westerly winds gusting to 90 mph.

13 March: Gale-force winds continued to prevent resumption of trawling. During the morning the freshwater pump supplying the generator cooling system failed, and the vessel returned to Belfast for repairs, berthing at 18h.20. Further inspection revealed damage to the casing of the pump, requiring spares to be sent up from Dublin.

14 March: Spent in Belfast harbour.

15 March: *Lough Foyle* departed at 23h15, but clutch slippage occurred almost immediately, necessitating re-berthing pending repair.

16 March: The clutch was tightened in the morning, and following satisfactory trials in the harbour basin, the vessel proceeded southwards to resume the survey. Station 83 commenced at 15h.30, but was terminated after 20 minutes because of continuous slippage of the clutch. The vessel once again returned to Belfast.

WORK COMPLETED

Thirty six valid hauls were completed from 2 - 11 March (Fig. 1). Thirteen of these were new stations for *Lough Foyle*. The positions of the trawl stations and the total catches are given in Table 1. The catch-rates of selected species are given in Table 2.

Although stratum 1 and the northern halves of strata 2 and 3 were not surveyed, a substantial portion of the important fishing grounds on both sides of the Irish Sea were surveyed, providing valuable information on the distribution of different species and size-classes of fish.

Out of a total of 11.3 tons of fish caught in 37 tows, some 5 tons were sorted to species level, and length measures were carried out on 3 tons of fish. Otoliths were taken from 451 cod, 753 whiting and 104 hake. Approximately 1500 fish stomachs were examined or frozen for later analysis. Thirty six plankton samples were taken for enumeration of eggs and early larvae of cod and other species.

ACKNOWLEDGEMENTS

The Master and personnel of the *Lough Foyle* are thanked for their enthusiastic cooperation throughout the cruise, and together with G. Heyn and Sons Ltd., for endeavouring to carry out repairs to the clutch and water pump with minimum delays to the cruise. The scientific personnel are particularly acknowledged for their efficient execution of a large quantity of work, often under rough sea conditions.

Signed:

Scientist - in charge: *M. J. Armstrong* .. date *16/3/92*

Ships master: *[Signature]* .. date *16 March 1992*

Division Head: *S. J. Heaney* .. date *27.3.1992*

E 1. Details of trawls during survey LF0592 (March 1992)

Date	trawl	shooting			hauling			mean depth (m)	dist. towed nm	total fish catch kg
		time	lat	long	lat	long				
March	61	9.25	54 33.1	4 31.5	54 33.1	4 35.4	48	2.36	32	
	63	12.46	54 35.8	4 18.1	54 36.4	4 14.9	55	1.91	75	
	256	15.36	54 35.7	4 00.4	53 37.3	3 56.7	33	3.02	177	
	64	17.40	54 38.3	3 45.5	54 36.0	3 43.4	17	2.79	61	
March	258	8.09	54 18.9	3 55.0	54 21.3	3 55.9	38	2.69	539	
	257	10.37	54 26.6	3 45.9	52 24.0	3 43.2	31	3.00	201	
	259	13.14	54 18.4	3 42.7	54 15.9	3 41.1	36	3.00	280	
	250	15.46	54 06.6	3 39.1	54 03.5	3 37.2	27	3.00	459	
March	242	7.35	54 06.9	4 04.9	54 04.1	4 01.4	33	3.00	278	
	249	11.35	53 48.6	3 44.4	53 46.6	3 41.2	36	3.00	125	
	247	14.23	53 36.2	3 32.6	53 34.0	3 29.3	26	3.00	203	
	246	17.12	53 28.9	3 43.8	53 28.8	3 49.4	36	3.00	2000	
March	245	6.58	53 30.2	4 13.9	53 31.0	4 15.9	41	1.80	143	
	243	10.33	53 46.7	4 07.4	53 49.1	4 09.7	51	3.00	256	
	102	13.50	53 43.8	4 36.2	53 42.8	4 39.3	71	2.08	110	
	77	16.00	53 49.4	4 44.9	53 51.1	4 41.0	84	3.00	202	
March	46	7.29	54 11.7	4 57.6	54 08.6	4 55.5	74	3.40	99	
	99	9.54	54 07.4	5 01.2	54 07.8	5 04.0	79	3.00	226	
	48	13.02	54 01.4	4 59.8	53 58.5	4 58.3	61	3.00	856	
March	79	7.10	53 41.3	5 59.2	53 44.7	6 01.4	28	3.00	647	
	78	9.32	53 46.4	6 04.0	53 49.5	6 05.2	27	3.00	601	
	89	12.12	53 47.9	5 54.2	53 50.9	5 56.1	44	3.00	411	
	71	14.30	53 54.5	5 54.7	53 54.2	5 49.1	45	3.00	215	
	73	17.15	53 50.0	6 03.6	53 52.1	6 07.2	25	3.00	611	
March	51	7.13	53 51.6	4 58.4	53 54.4	4 59.0	72	3.00	477	
	96	10.03	53 49.5	5 06.7	53 52.8	5 06.0	69	3.00	156	
	216	12.15	53 58.3	5 09.9	53 55.2	5 12.6	68	3.05	254	
	50	15.20	53 46.3	5 19.8	53 43.2	5 21.3	81	3.21	207	
	103	17.30	53 36.3	5 22.9	53 32.7	5 25.7	84	4.01	66	
March	75	7.17	53 41.6	5 49.6	54 38.5	5 49.8	62	3.22	159	
	92	10.00	53 36.8	5 56.3	53 34.7	5 54.1	39	2.50	331	
	93	12.40	53 31.0	5 50.7	53 28.1	5 49.6	65	3.00	114	
	94	14.55	53 23.4	5 46.5	53 20.3	5 48.0	51	3.26	273	
March	56	11.48	53 29.9	5 41.4	53 32.5	5 44.1	70	3.00	182	
	90	13.56	53 37.8	5 41.1	53 41.2	5 40.6	84	3.60	83	
	208	16.18	53 48.7	5 46.5	53 20.0	5 44.9	62	3.07	218	
March	83	15.30	54 23.1	5 17.9	54 21.8	5 17.2	83	.90	8	

Table 2. Cruise LF/05/92: catches of selected species
in kg per tow

STN.	dist. towed	COD	WHITING	HAKE	HADDOCK	POUTING	POOR COD	NORWAY POUT	HERRING	SPRAT	PLAICE	DAB FLOUNDER	GURNAEDS	LESSER SP. DOG	SPUR- DOG	NEPHEU
83*	.90	1.8	2.5	.4	.0	.1	1.3	1.0	.13	.06	.2	.0	.0	.9	.0	
79	3.00	16.8	335.0	.0	3.4	.0	.8	5.6	3.47	1.03	30.3	236.0	.7	4.8	2.6	.0
78	3.00	1.4	363.0	.0	1.8	.0	.0	.1	21.90	6.97	35.9	151.0	5.3	1.0	1.2	.0
99	3.00	6.4	373.0	.5	1.0	.0	.1	1.3	5.70	1.25	5.4	8.8	1.7	1.2	.0	.0
71	3.00	3.9	89.3	.1	1.8	.0	1.0	11.4	79.00	1.06	3.7	17.4	.6	1.2	.0	.0
73	3.00	12.5	365.0	.0	1.3	.0	.0	.3	62.95	33.17	24.9	87.5	6.9	.1	.0	.0
92	2.50	18.2	268.0	.0	9.2	1.6	.7	9.9	2.60	2.40	5.1	4.3	.0	2.0	.8	.0
94	3.26	39.1	150.0	.0	25.2	1.1	3.4	8.3	.14	.00	31.6	.7	.0	.7	.0	.0
75	3.22	9.3	137.0	2.5	.8	.0	.1	1.8	.42	1.87	.5	.2	.0	.8	1.8	.0
93	3.00	34.2	51.3	.0	6.4	.6	5.1	8.9	.75	.86	3.0	.8	.0	.5	.0	.0
56	3.00	95.7	74.8	.0	1.8	.0	3.4	3.7	.58	.37	4.0	.1	.0	.6	1.2	.0
90	3.60	16.3	56.4	.0	.1	.0	1.1	1.9	.34	1.65	.3	.1	.0	.0	.0	.0
108	3.07	8.0	188.0	1.2	.9	.0	.8	5.6	1.87	.90	.0	.1	.0	10.2	.0	.0
46	3.40	39.7	21.1	10.9	.5	.4	1.9	1.5	.10	.15	2.2	7.7	.9	1.9	2.4	.0
99	3.00	6.1	146.0	12.7	1.6	.4	2.0	8.1	.06	.05	1.4	2.7	1.1	9.4	.0	.0
48	3.00	7.1	678.0	5.3	17.9	.2	68.4	47.2	1.62	.00	1.9	1.5	.0	7.1	7.1	.0
51	3.00	11.1	346.0	.0	29.6	1.0	3.9	6.4	.12	.51	4.3	2.0	.0	8.3	45.1	.0
96	3.00	24.1	76.6	.4	4.7	.0	2.6	2.0	.23	.10	.6	3.2	.0	2.7	7.3	.0
116	3.05	21.0	178.0	5.6	.3	.0	.8	9.7	.60	.04	.8	1.8	.0	22.5	.6	.0
50	3.21	15.5	113.0	1.3	.1	.0	3.1	10.1	.02	.29	.8	2.8	.0	49.6	.0	.0
103	4.01	4.5	31.3	.0	4.8	.0	.4	1.7	.19	.36	1.8	.5	.0	7.5	.0	.0
61	2.40	13.8	2.4	.0	.0	.5	1.8	.0	.00	.00	.3	.0	.0	.2	12.0	.0
63	1.91	4.7	16.9	1.2	.0	7.1	18.8	.0	.70	.40	1.1	.1	.0	.0	23.0	.0
156	3.02	1.4	126.0	.0	.0	1.2	1.1	.0	.40	.10	21.6	14.4	2.5	.3	5.7	.0
64	2.79	3.2	20.4	.0	.0	.2	.0	.0	.20	.90	16.2	3.2	5.1	.0	6.5	.0
158	2.69	2.6	438.0	.0	.0	15.0	11.5	.1	16.20	.40	18.2	11.2	12.4	.0	5.4	.0
157	3.00	11.4	161.3	.0	.0	1.4	.2	.0	3.70	1.50	9.6	3.6	5.1	.0	2.0	.0
159	3.00	1.4	218.0	2.3	.0	5.8	2.8	.0	13.00	1.10	5.9	18.0	10.7	.0	.0	.0
150	3.00	13.6	318.0	.3	.0	7.0	3.1	.0	2.65	.42	6.2	98.0	5.3	.0	1.7	.0
142	3.00	2.7	169.0	.0	.2	1.7	10.1	.0	1.82	.20	2.0	30.9	44.6	5.0	6.8	.0
149	3.00	9.8	74.2	.0	.2	.0	1.5	.1	.30	.18	2.7	5.3	16.5	.4	1.0	8.3
147	3.00	18.6	112.0	.0	.0	.8	17.8	.2	3.13	.10	6.0	28.4	3.6	5.4	1.4	.0
148	3.00	34.0	1530.0	.0	.0	.0	27.0	7.0	6.00	.00	189.0	112.0	19.0	7.3	.0	.0
145	1.80	29.4	19.4	1.8	.0	19.8	8.9	.2	.52	1.96	5.5	.8	6.6	.0	36.0	4.3
143	3.00	19.5	1.6	3.4	.0	22.0	6.7	.1	.18	.16	.7	.0	9.8	3.2	170.0	.0
102	2.09	18.7	4.8	.0	.0	11.2	4.9	.0	.00	.18	1.8	.2	.0	.4	65.0	.0
77	3.00	7.6	39.2	2.6	14.9	9.4	12.1	.3	.29	.41	1.0	.2	.0	.3	105.0	.0

Invalid tow

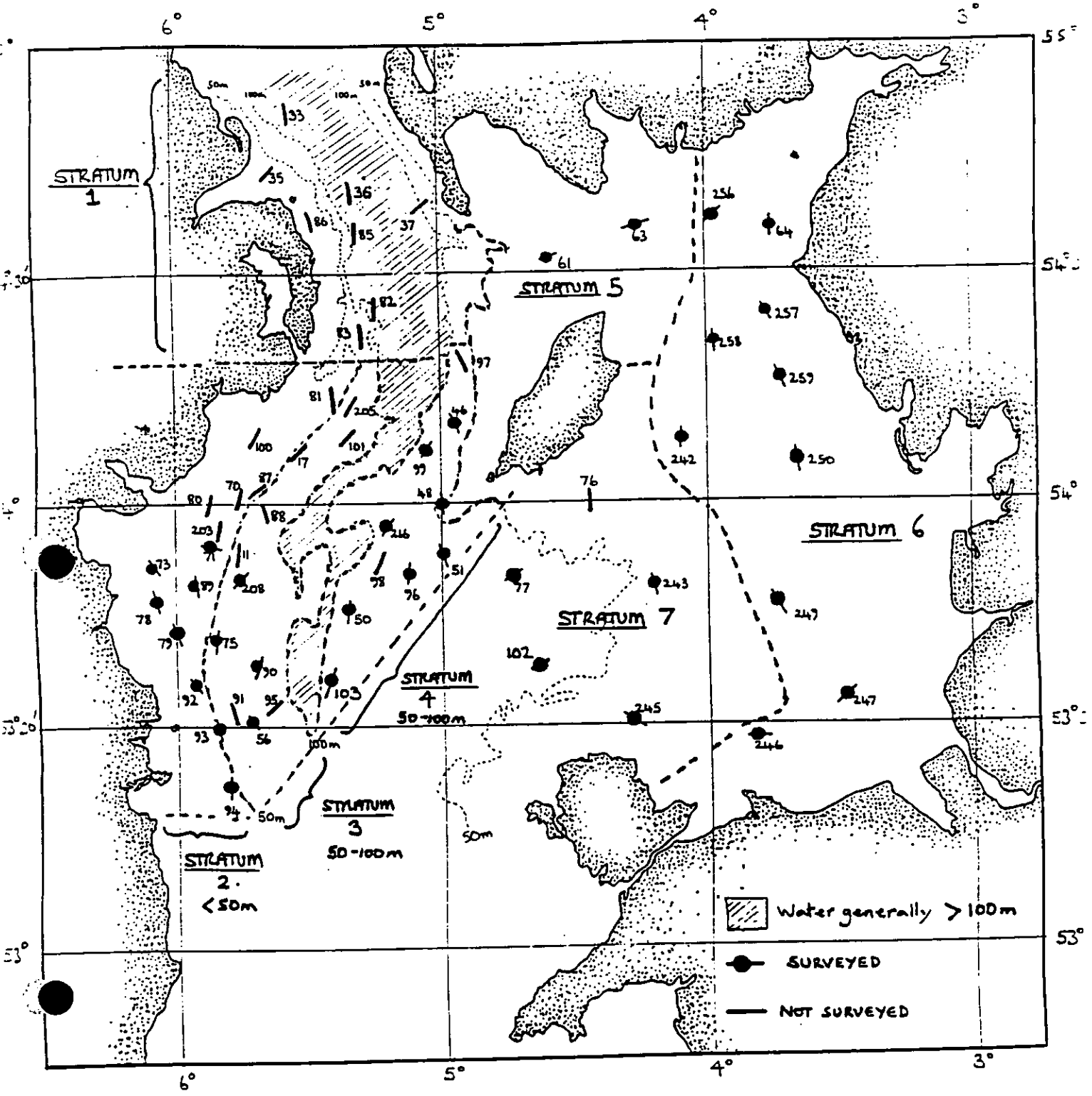


Fig. 1. Trawl stations forming the basis of the March 1992 groundfish survey on R.V. *Lough Foyle*, showing stations actually fished, and the division of the area into survey strata on the basis of depth and sediment type (see text). Stratum 1 and the northern part of strata 2 and 3 were not surveyed due to bad weather and mechanical problems.

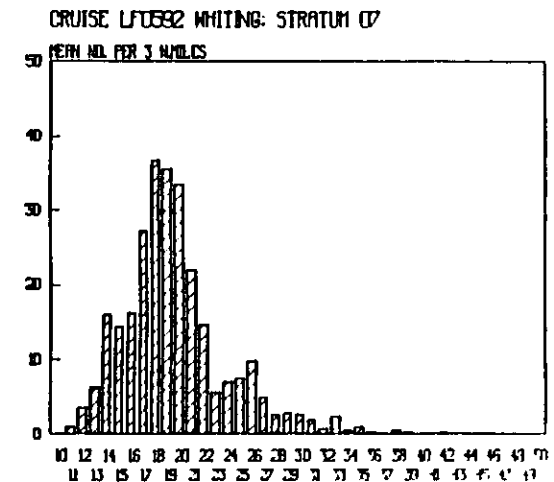
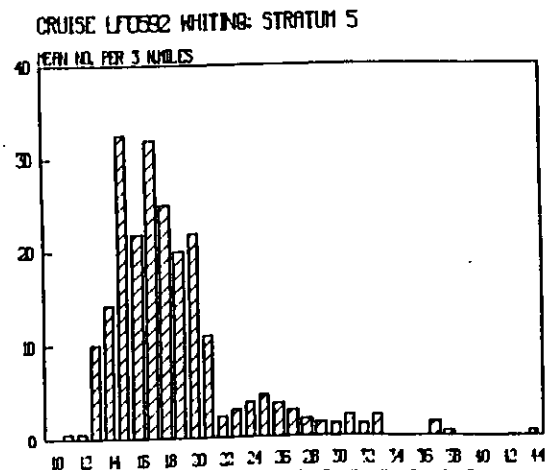
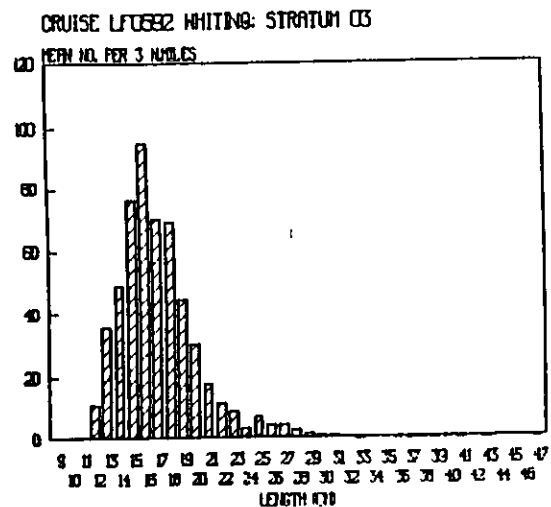
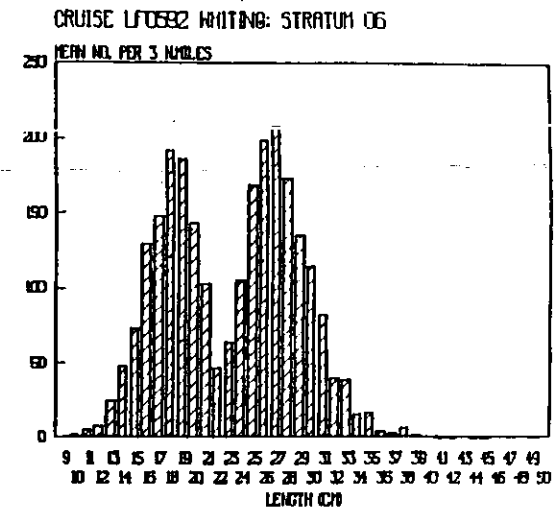
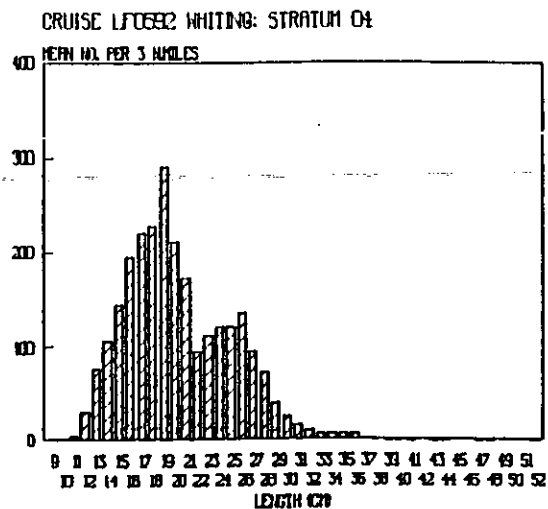
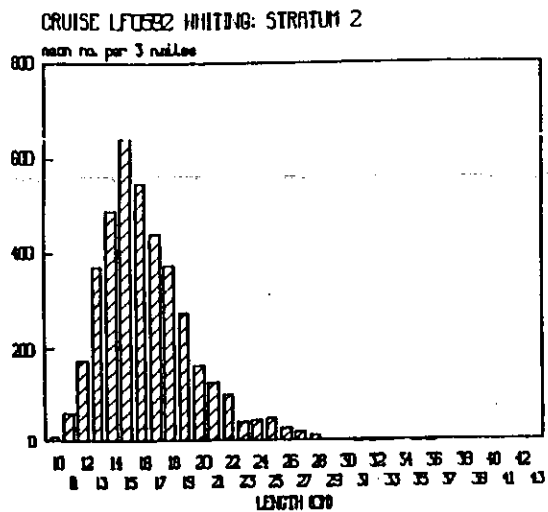


Fig. 2. Mean length frequencies of whiting caught during the March 1992 trawling survey, according to survey stratum (see Fig. 1 for locations of strata), showing that fish longer than 20 cm were mainly distributed off the west coast of the Isle of Man and off the coasts of England and North Wales.