

CRUISE REPORT: CRUISE LF0595 DEMERSAL FISH SURVEY

VESSEL: R.V. Lough Foyle (DANI)

DATES: 27 February - 11 March 1995

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

TYPE OF SURVEY: Otter trawl, acoustics, ichthyoplankton

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 for whiting, haddock, juvenile cod and plaice for use at ICES Working Groups;
3. To compare trawl catches with estimates of abundance and target strength distribution of demersal fish obtained using the Simrad EK-500 echosounder in the vicinity of the trawls;
4. To examine geographic patterns of infection of whiting and cod by external parasites and codworm;
5. To collect fish stomachs for predation studies;
6. To collect data and ovary samples for the EC AIR project on estimating abundance of cod, plaice and sole using the annual egg production method;
7. To collect samples of dabs for contaminant monitoring at DANI;
8. To collect samples of cephalopods for a project at Aberdeen University.

PERSONNEL

M. Armstrong	DANI	(SIC)
C. Burns*	DANI	
P. Coulahan	QUB	
M. Dickey-Collas	DANI	
M. McAliskey	DANI	
W. McCurdy	DANI	
J. Peel	DANI	
P. Newton	Port Erin Marine Lab	
D. Jones**	NI Fishing Industry	

(* disembarked in Dublin; ** embarked in Dublin)

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.

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, haddock and hake were taken for recording length, mass, sex, maturity stage and for removal of otoliths for ageing. Levels of infestation of the whiting and cod by external parasites and codworm were estimated. Samples for cruise objectives (5) - (8) were then taken.

The acoustic towed body with 38 kHz split-beam transducer was deployed at selected trawl stations and between stations to examine and quantify the echoes from demersal fish targets in the lower water column. All acoustic data were saved for post-processing using the EP-500 software.

For the purposes of analysis, the survey area was divided into seven strata defined by depth and substratum, as described in Table 1 and shown in Fig. 1.

CRUISE NARRATIVE

Sunday 27 February

Lough Foyle left Belfast Harbour and proceeded overnight towards station 83. A safety demonstration was given before departure by Mr Woods.

Monday 28 February

Four trawls were completed (stations 83, 81, 101 and 17) in 25-35 mph SW winds. The vessel anchored overnight in Dundrum Bay.

Tuesday 29 February

Stations 100, 70, 88 and 208 were fished in 18-38 mph SW winds. The vessel anchored overnight at Skerries.

Wednesday 1 March

Stations 79, 73, 71 and 216 were completed. Conditions were moderate to rough with 15-20 mph westerly winds. The vessel proceeded northwards overnight towards station 97.

Thursday 2 March

Stations 97, 46, 99, 48 and 51 were completed. Winds were again southwesterly, moderating by the afternoon.

Friday 3 March

Only three stations were completed (77, 96 and 50) due to a delay at station 50 when the clutch on the port trawl winch disengaged whilst shooting the net. This was caused by wear in the linkage although it was apparent that the clutch had been only partly engaged prior to the incident. The clutch was re-engaged with some difficulty and the net was then hauled and re-shot. On completion of station 50, the vessel proceeded to Dublin for the mid-cruise break, berthing at around 20h.00.

Saturday 4 March

The vessel remained in Dublin all day.

Sunday 5 March

Lough Foyle left Dublin at 08h.00 and proceeded to station 94. During transit, an emergency drill was held. Stations 94, 56 and 93 were completed in rough sea conditions with westerly winds gusting up to 45 mph. The vessel anchored at Skerries for the night.

Monday 6 March

Stations 92, 75, 90, 103 and 105 were completed. Conditions were again rough with strong westerly winds. The vessel then proceeded to North Anglesey and anchored overnight.

Tuesday 7 March

Only three stations were completed (246, 245 and 249). Conditions were mostly poor beyond the shelter of Anglesey, with strong SW winds. The vessel then dodged overnight in the vicinity of the next trawl station.

Wednesday 8 March

Strong winds and rough seas prevented trawling during the morning and early afternoon. Shelter was found at anchor in Ramsey Bay during the afternoon. During late afternoon conditions improved sufficiently for trawl station 258 to be completed. During the night, the vessel drifted off Cumbria.

Thursday 9 March

Stations 64, 257, 259, 250 and 242 were completed in moderate to fresh S - SW winds. Due to an imminent SE gale, it was decided to anchor off Peel during the night.

Friday 10 March

Gale-force winds reaching 50 mph caused the anchor to drag during the morning, requiring the vessel to dodge between Peel and the Targets for much of the day. A change in wind direction during the evening allowed secure anchorage to be found in Ramsey Bay.

Saturday 11 March

An improvement in weather allowed the remaining stations in survey stratum 7 to be completed (76, 243 and 102) in fine sea conditions. On completion of station 102, the vessel proceeded overnight towards Belfast Lough. The presence of the surface buoys marking the new moored oceanographic instruments was checked in transit.

Sunday 12 March

Trawl stations 35 and 86 were completed during the morning, and the vessel then returned to Belfast harbour.

WORK COMPLETED

Forty two valid hauls were completed (Fig. 1). The positions of the trawl stations are given in Table 2.

Length measures were carried out on all fish species. The new heavy-duty Marel balance was installed in Dublin, and greatly facilitated the work in the fish lab.

A total of 268 cod, 1050 whiting, 239 haddock and 47 hake were analysed for length, mass and maturity stage. Where maturity was in doubt, ovaries were sectioned into cassettes for histological analysis. Otoliths were taken from each fish for ageing. Each cod and whiting sampled for age was inspected for external parasites and for numbers of cod-worm in the belly flaps. Ovaries from plaice, haddock, whiting and sole were sampled at selected stations for the EC AIR project. Tissue samples were collected from up to 50 individuals of selected species for genetics studies within the AIR project. Fish stomachs were collected at each station and frozen for later analysis. Random samples of up to 50 dabs longer than 18cm were collected at each station and frozen for contaminant analysis. All squids were frozen for a project at Aberdeen University.

Echo-integration and target strength data were collected in the vicinity of stations between Clogher Head and Dublin, off the west coast of the Isle of Man, and off Cumbria.

PRELIMINARY RESULTS

The overall catch-rates of selected species are given in Table 3. Catch rates of whiting and haddock above the minimum landing size are shown in Table 4. Length distributions of whiting in selected survey strata are shown in Figure 2. As in previous surveys, the coastal region between Dundrum Bay and Lambay Island is shown to be a major nursery area for young whiting and haddock, whereas larger whiting were more prevalent in the eastern Irish Sea and around the Isle of Man. Young cod were most abundant along the Irish Coast and off the north coast of Wales.

Length compositions of whiting, cod and haddock averaged over survey strata are shown in Fig. 3. The strong 1994 year-class of haddock recorded in the September 1994 groundfish survey was again apparent. The 1993 and 1994 year-classes were prominent in the whiting catches and appear to be of similar magnitude to the above-average 1991 year class. Numbers of cod in the expected length range for 1-year-olds were lower than observed in March 1992 and 1994 but greater than in March 1993.

ACKNOWLEDGEMENTS

The Master and personnel of the Lough Foyle are thanked for their enthusiastic cooperation throughout the cruise. The Fishing Master is particularly acknowledged for ensuring efficient and consistent trawling operations. The scientific personnel are thanked for their hard work in sorting and measuring the large catches taken on this trip.

Signed:

Scientist - in charge: *M. J. Armstrong* date *12-3-95*

Ships master: *J. J. Henry* date *12-3-95*
27.3.95

Division Head: date

Table 1. Survey strata used for data analysis

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

Table 2 Details of trawls during cruise LF0595								
Date	Station	Time shot	Shooting position		Hauling position		Mean Depth (m)	Distance towed (nm)
			Latitude	Longitude	Latitude	Longitude		
27 Feb.	83	7h.22	54 23.5	5 18.0	54 20.2	5 16.7	89	3
	81	9h.54	54 15.1	5 24.4	54 12.1	5 24.3	48	3
	101	12h.45	54 08.4	5 19.6	54 05.4	5 18.7	101	3
	17	15h.12	54 08.2	5 31.7	54 05.3	5 32.2	51	3
28 Feb.	100	7h.22	54 11.5	5 40.6	54 08.6	5 41.1	29	3
	70	9h.36	54 02.3	5 45.2	53 59.4	5 46.3	43	3
	88	11h.36	53 59.2	5 39.7	53 56.3	5 39.9	68	3
	208	14h.45	53 50.2	5 44.8	53 47.3	5 46.5	62	3
1 March	79	7h.30	53 41.3	5 58.1	53 44.2	5 59.0	34	3
	73	9h.20	53 49.3	6 04.0	53 52.1	6 05.9	30	3
	71	11h.40	53 54.3	5 55.4	53 54.6	5 50.2	42	3
	216	15h.12	53 54.3	5 14.3	53 56.9	5 11.8	75	3
2 March	97	7h.15	54 20.3	4 55.3	54 17.4	4 53.5	74	3
	46	9h.49	54 12.3	4 57.1	54 08.7	4 57.5	84	2.8
	99	12h.37	54 05.2	5 03.9	54 07.8	5 01.4	82	3
	48	14h.53	54 01.0	5 00.3	53 58.3	4 58.3	64	3
	51	17h.00	53 53.8	4 59.5	53 50.8	4 58.1	68	3
3 March	77	7h.12	53 51.0	4 40.6	53 48.6	4 42.6	77	2.6
	96	10h.57	53 51.8	5 05.7	53 48.7	5 05.0	73	3
	50	14h.55	53 46.1	5 20.9	53 43.1	5 21.8	80	3
5 March	94	10h.22	53 21.8	5 46.7	53 29.9	5 45.3	71	3
	56	12h.44	53 30.4	5 39.4	53 30.5	5 44.1	75	2.8
	93	15h.16	53 32.5	5 52.5	53 29.8	5 49.8	47	3
6 March	92	7h.22	53 34.4	5 54.1	53 37.1	5 56.3	38	3
	75	9h.41	53 40.7	5 48.6	53 43.7	5 50.7	55	3
	90	12h.44	53 38.8	5 43.7	53 36.2	5 41.0	80	3
	103	15h.05	53 33.6	5 25.9	53 35.5	5 21.7	93	3
	105	17h.41	53 40.5	5 06.9	53 41.9	5 04.4	72	2
7 March	245	8h.18	53 30.4	4 16.1	53 30.2	4 10.9	40	3
	246	10h.37	53 28.7	3 49.0	53 29.1	3 43.7	34	3
	249	13h.45	53 46.1	3 41.3	53 48.5	3 44.6	38	3
8 March	258	17h.43	54 18.8	3 55.5	54 21.5	3 57.7	39	3
9 March	64	7h.10	54 35.3	3 44.5	54 38.1	3 46.6	21	3
	257	9h.40	54 26.5	3 45.7	54 23.8	3 43.2	25	3
	259	11h.30	54 18.0	3 42.6	54 15.2	3 40.5	35	3
	250	13h.50	54 06.8	3 38.7	54 03.6	3 38.3	32	3
	242	16h.26	54 04.9	4 00.9	54 06.7	4 05.1	36	3
11 March	76	8h.06	54 00.4	4 24.7	53 58.9	4 29.2	45	3
	243	10h.51	53 49.3	4 10.6	53 46.0	4 08.1	46	3
	102	14h.05	53 44.5	4 39.1	53 47.3	4 41.5	64	3.2
12 March	35	6h.42	54 43.3	5 41.4	54 44.0	5 36.3	20	3
	86	8h.52	54 37.8	5 26.6	54 35.0	5 25.5	44	3

Table 3 Catches of selected species during cruise LF0595 in kg per tow, by survey stratum.									
STRATUM 1									
	Stn. 35	Stn. 86	Stn. 83						
Cod	0.07	24.46	5.34						
Whiting	106.03	88.46	74.73						
Hake			0.01						
Haddock		1.05	0.06						
Norway Pout	0.01	1.81	8.17						
Poor cod	0.05	3.85	1.05						
Herring	33.16	4.59	0.01						
Sprat	4.18	0.11	0.51						
Plaice	1.40	0.92	0.15						
Dab	1.54	0.56	0.28						
Flounder									
Gurnards	1.05	0.01							
Less. sp. dogfish		3.20							
Nephrops	0.04		1.16						
Squid									
STRATUM 2									
	Stn. 81	Stn. 100	Stn. 70	Stn. 71	Stn. 73	Stn. 79	Stn. 92		
Cod	3.21	2.29	2.47	12.97	3.73	5.78	9.22		
Whiting	156.67	618.60	220.86	343.08	162.00	381.74	701.38		
Hake	0.05								
Haddock		221.80	155.74	13.20	13.00	68.35	323.96		
Norway Pout	6.78		2.81	6.80	0.21	1.82	1.68		
Poor cod	0.50	0.03	0.23	0.28		0.33	0.69		
Herring	239.32	38.06	123.12	506.82	64.82	24.12	4.86		
Sprat	1.89	0.68	1.82	4.70	26.08	0.27	0.03		
Plaice	0.60	106.40	16.07	18.77	14.64	24.51	15.97		
Dab	1.09	133.68	20.21	31.01	25.81	41.83	10.39		
Flounder		13.65	1.02	1.01	1.39				
Gurnards	0.16	0.46	1.53	0.19	0.44	12.46	2.40		
Less. sp. dogfish	3.95	1.70	3.65						
Nephrops	1.53	0.07		1.13	0.10	0.53	3.74		
Squid									
STRATUM 3									
	Stn. 101	Stn. 17	Stn. 88	Stn. 208	Stn. 75	Stn. 90	Stn. 56	Stn. 93	Stn. 94
Cod	0.77	1.31	3.62	7.64	6.72	2.92		6.63	16.32
Whiting	12.40	174.01	534.41	254.09	1474.50	81.87	67.79	163.12	46.84
Hake	0.92	0.37	2.10						
Haddock		0.11	36.57	0.60	3.71		1.49	213.47	0.02
Norway Pout	4.88	29.56	53.81	15.65	4.85	2.21	1.08	3.50	1.13
Poor cod	0.84	0.73	1.25	0.68	0.25	0.39	0.72	2.18	2.19
Herring	0.52	22.82	111.40	18.12	3.81	1.96	0.74	0.23	0.27
Sprat	2.10	0.25	0.41	0.12	0.03	1.31	0.99	0.11	0.05
Plaice	0.28	1.80	1.70	2.00	5.87	0.52	3.42	8.52	1.29
Dab	0.03	2.60	1.27		0.24	0.08		0.48	0.09
Flounder									
Gurnards	1.32	0.48	4.44	8.99	1.83		0.15	1.78	0.03
Less. sp. dogfish	2.78		0.73			0.24	7.64	8.78	110.58
Nephrops	20.79	12.96	7.71	18.56	4.93	1.88	4.78	0.61	
Squid			0.49					0.85	

Table 3 continued									
STRATUM 4	Stn. 97	Stn. 46	Stn. 99	Stn. 48	Stn. 216	Stn. 51	Stn. 96	Stn. 50	Stn. 103
Cod	13.16	13.13	17.99	2.15	1.36	1.11	2.90	12.29	0.08
Whiting	59.36	26.23	56.98	1244.90	30.37	15.53	60.67	87.68	5.96
Hake	2.34	2.64	2.58						
Haddock	12.06	0.71	2.38	81.03		15.65	10.71	5.45	6.37
Norway Pout	54.28	11.40	12.23	18.96	3.32	1.98	3.26	6.29	1.27
Poor cod	2.53	0.36	1.95	26.63	0.30	1.52	3.08	0.87	0.75
Herring	0.14	0.18	0.07	0.07	1.16	0.19	0.44	0.46	0.07
Sprat	0.08	0.42	0.69	0.13	1.28	0.22	0.35	0.14	0.20
Plaice	1.84	1.77	1.35	0.47	0.30	0.70	0.41	0.63	3.18
Dab	1.44	1.80	2.18	1.20	0.60		0.14	0.08	0.14
Flounder									
Gumards	15.11	6.35	4.75	8.64	0.76	0.27	1.51	0.11	4.56
Less. sp. dogfish	7.52	9.88	113.28	53.29	3.37	67.31	10.09	0.27	2.30
Nephrops	1.90	19.68	4.34	0.12	5.24	0.59	1.26	0.60	0.08
Squid				0.61					0.52
STRATUM 6	Stn. 256	Stn. 64	Stn. 257	Stn. 258	Stn. 259	Stn. 242	Stn. 250	Stn. 249	Stn. 246
Cod		6.95	2.22	5.83	2.19	3.43	0.25		2.96
Whiting		86.91	208.66	69	113.32	523.9	168.5	99.39	811.35
Hake									
Haddock					0.04	0.34		4.68	
Norway Pout			0.01	0.1		0.11		0.05	4.34
Poor cod		0.04	0.41	1.66	2.48	18.22		0.81	21.89
Herring		0.71	2.92	5.32	1.68	107	11.03	1.46	24.2
Sprat		0.64	0.32	0.95	0.21	0.05	1.11	0.82	0.4
Plaice		24.29	4.7	20.04	6.84	4.06	19.24	9.3	44.27
Dab		2.92	1.41	5.28	18.18	12.07	49.07	60.62	127.69
Flounder		4.07	11.15	3.73	9.2	8.88	13.25	30.74	6.91
Gumards		0		0.09	0.01	2	0.01	0.42	6.31
Less. sp. dogfish		11.35	2.58	58.94	4.72	7.62	1.68	3.45	5.83
Nephrops			45.36	7.88	44.13		9.01		
Squid									
STRATUM 7	Stn. 105	Stn. 77	Stn. 102	Stn. 76	Stn. 243	Stn. 245			
Cod	2.07	16.00	10.63	1.85	19.62	2.12			
Whiting	3.62	48.24	85.54	18.94	2.39	6.07			
Hake						0.31			
Haddock	4.85	7.75	7.15	0.04					
Norway Pout	0.21	1.01	0.86		0.20	0.15			
Poor cod	0.18	5.45	2.40	8.55	2.64	3.65			
Herring		0.74	0.32		0.25				
Sprat	0.13	0.05	0.01	0.05	0.04	0.90			
Plaice	3.44	1.64	16.10	14.73	1.43	3.47			
Dab	0.17		0.59	0.05	0.34	0.12			
Flounder	0.41		7.19	16.61	5.69				
Gumards	2.91	1.06	45.33	7.03	9.96	0.07			
Less. sp. dogfish	3.86	325.38	35.68	7.39	97.86	43.50			
Nephrops		0.03							
Squid			0.26	0.86					

Table 4 Catches of whiting and haddock in kg per 3 nautical miles (approx 1 hour) towed.						
for fish below and above the minimum landing size of 27 cm (whiting) and 30 cm (had)						
STRATUM	STATION	WHITING		HADDOCK		
		below MLS	above MLS	below MLS	above MLS	
1	35	106	0	0	0	
	86	52	36	0.7	0.4	
	83	63	11	0.1	0.0	
2	81	140	17	0.0	0.0	
	100	549	69	221.8	0.0	
	70	190	31	144.3	11.4	
	71	339	4	9.8	3.4	
	73	159	3	6.0	7.0	
	79	363	18	57.2	11.1	
	92	645	56	309.5	14.5	
3	101	12	0.4	0.0	0.0	
	17	171	3	0.1	0.0	
	88	508	26	9.0	27.6	
	208	244	11	0.6	0.0	
	75	1396	79	2.9	0.8	
	90	81	1	0.0	0.0	
	56	65	2	0.1	1.4	
	93	159	4	193.5	20.0	
	94	47	0.2	0.0	0.0	
4	97	53	6	0.0	12.0	
	46	25	1	0.2	0.2	
	99	49	9	0.0	2.4	
	48	1042	203	77.3	3.8	
	51	26	4	8.9	6.8	
	96	14	2	7.7	3.0	
	216	57	4	0.0	0.0	
	50	82	6	0.2	5.2	
	103	5	1	5.4	1.0	
7	105	4	0	1.0	3.9	
	77	40	9	2.3	5.4	
	102	71	15	6.9	0.3	
	243	1	1	0.0	0.0	
	76	5	14	0.0	0.0	
	245	3	4	0.0	0.0	
6	246	365	447	0.0	0.0	
	242	296	228	0.3	0.0	
	249	46	54	0.4	4.3	
	250	107	61	0.0	0.0	
	258	56	13	0.0	0.0	
	259	80	34	0.0	0.0	
	257	34	43	0.0	0.0	
	64	47	40	0.0	0.0	

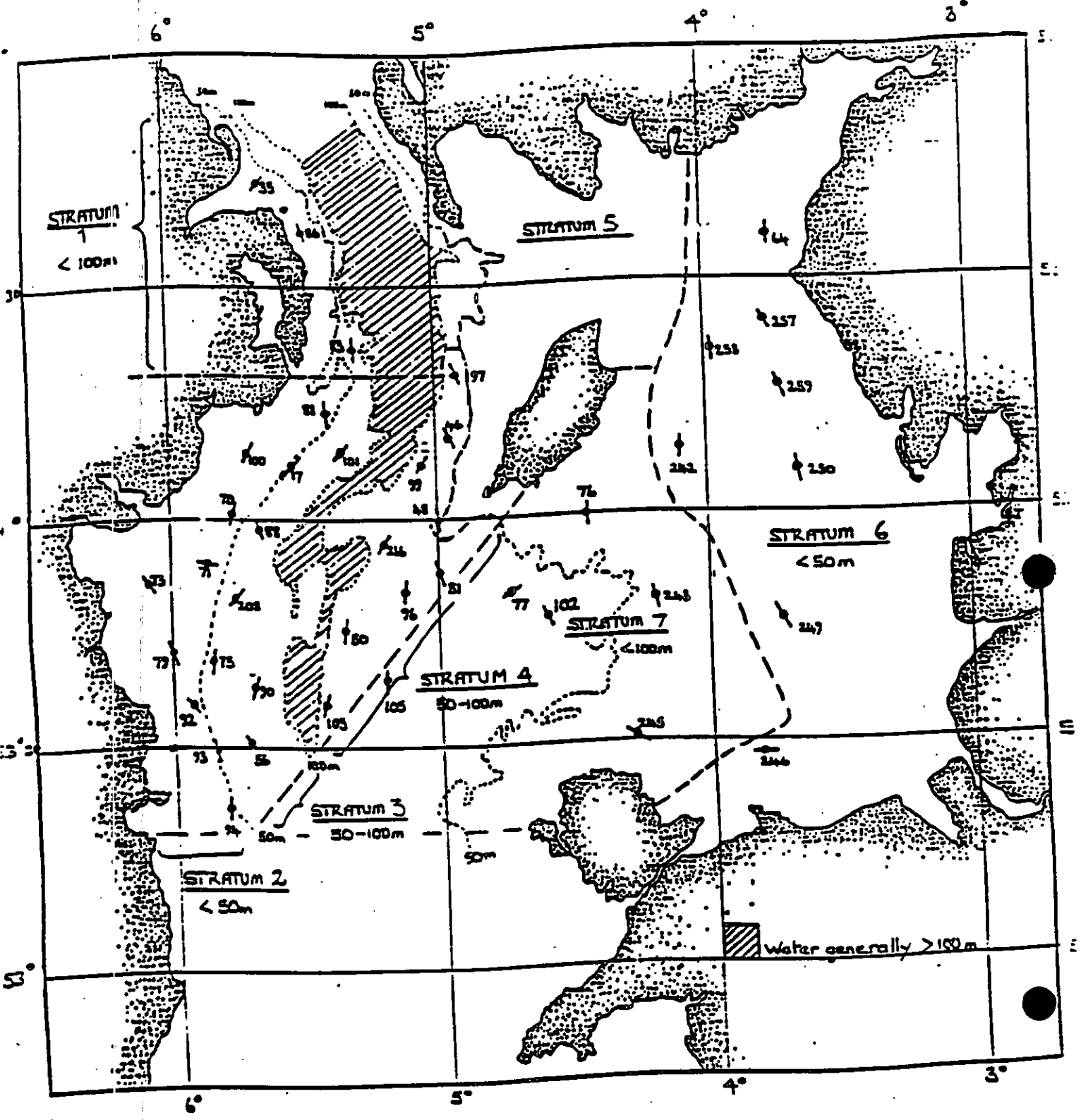
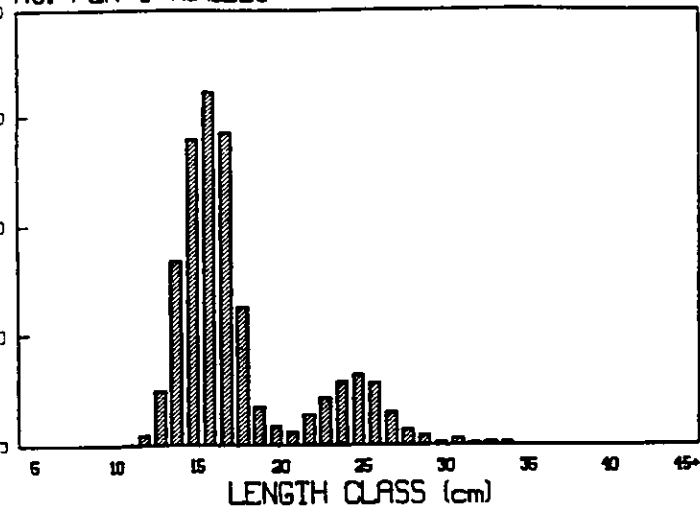


Fig. 1 Stations surveyed during cruise LF0595

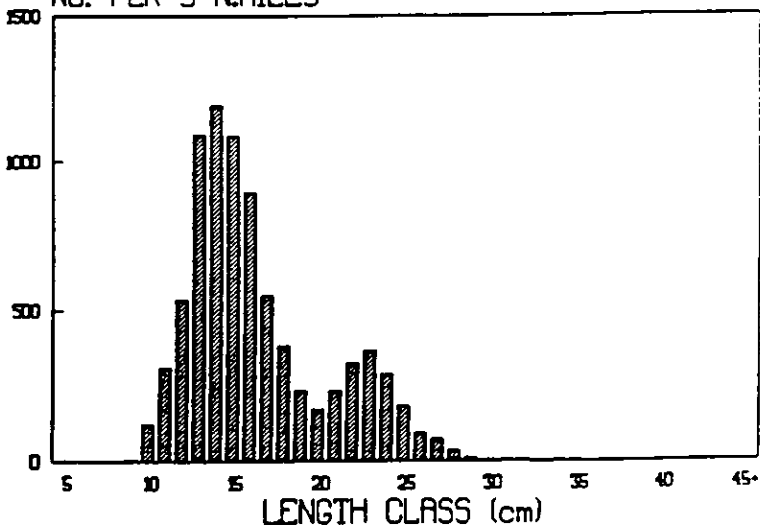
WP NG MARCH 1995 STRATUM 1

No. PER 3 N.MILES



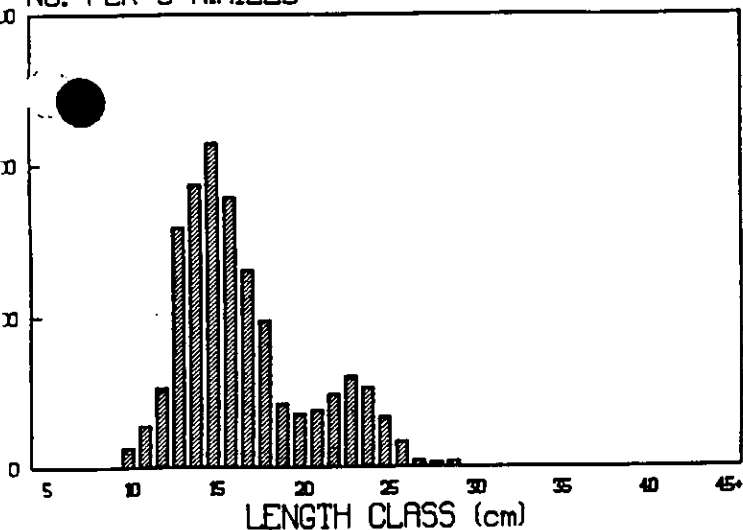
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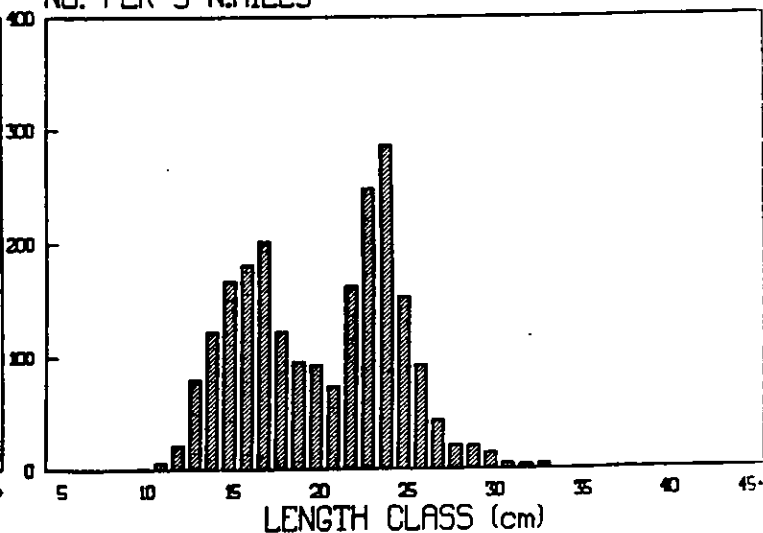
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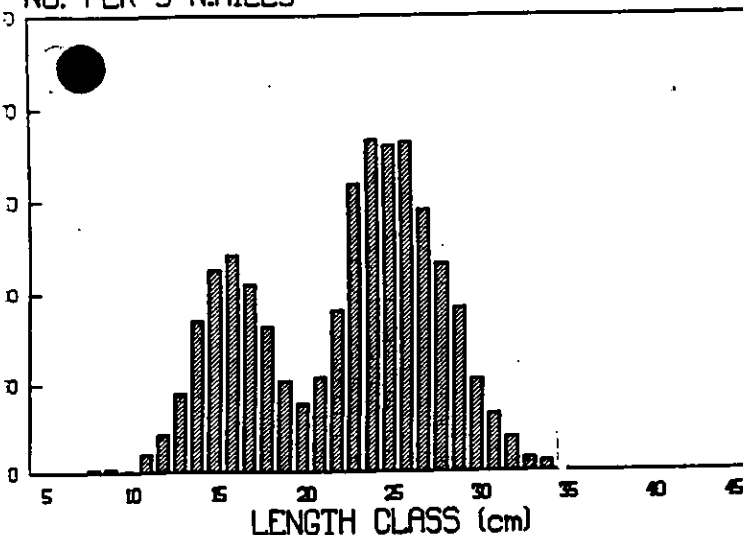
WHITING MARCH 1995 STRATUM 4

No. PER 3 N.MILES



WHITING MARCH 1995 STRATUM 6

No. PER 3 N.MILES



WHITING MARCH 1995 STRATUM 7

No. PER 3 N.MILES

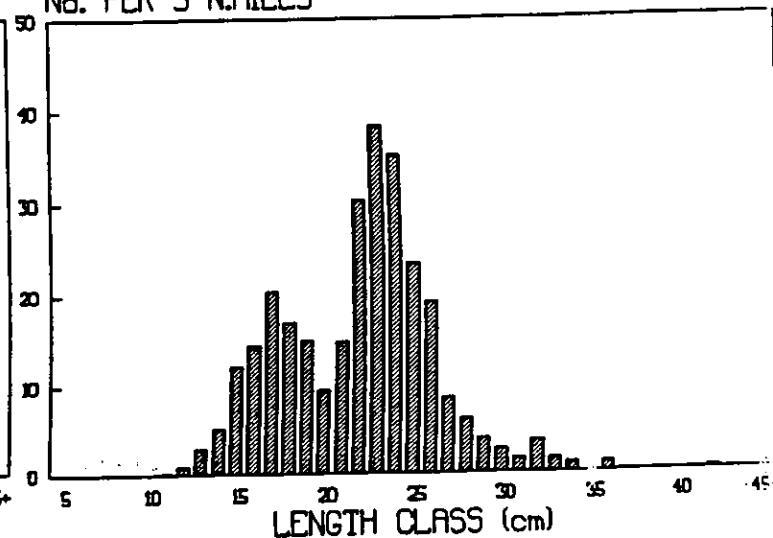
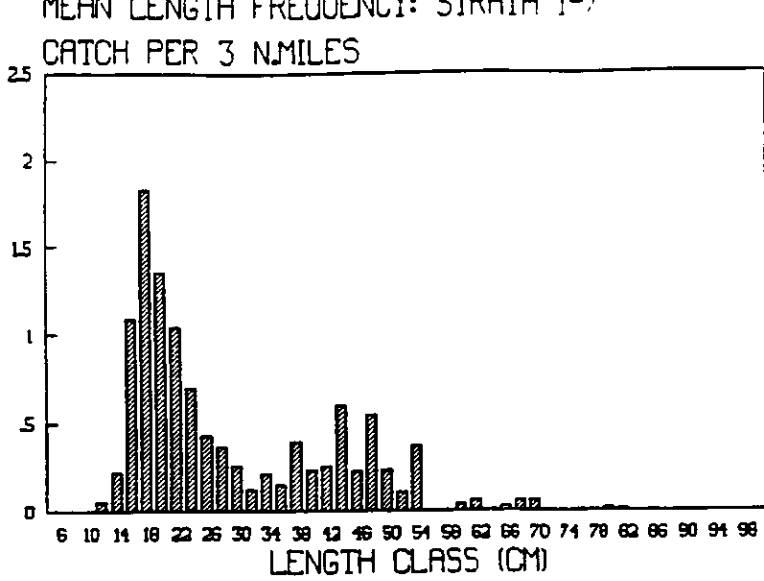
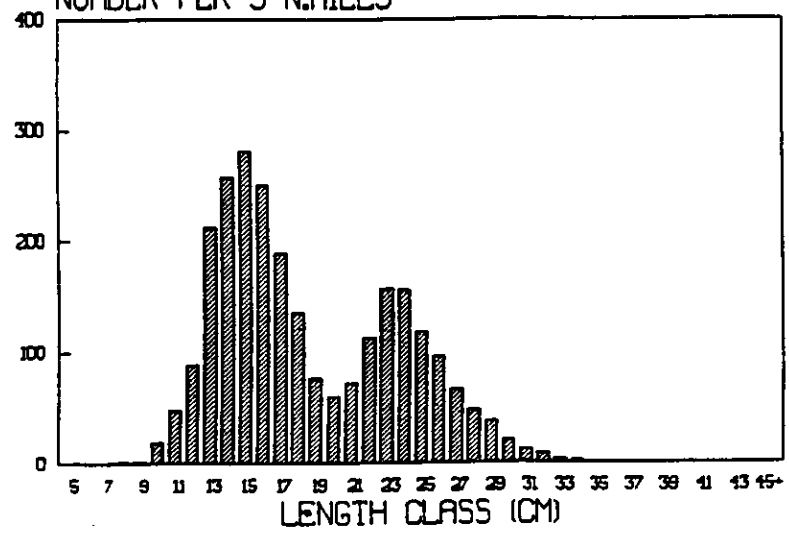


Fig. 2 Mean length frequencies of whiting during cruise LF0595, for survey strata 1 - 7. Note different scale on each plot.



WHITING: MARCH 1995
MEAN LENGTH FREQUENCY: STRATA 1 - 7
NUMBER PER 3 N.MILES



HADDOCK: MARCH 1995
MEAN LENGTH FREQUENCY: STRATA 1-7
NUMBERS PER 3 N.MILES

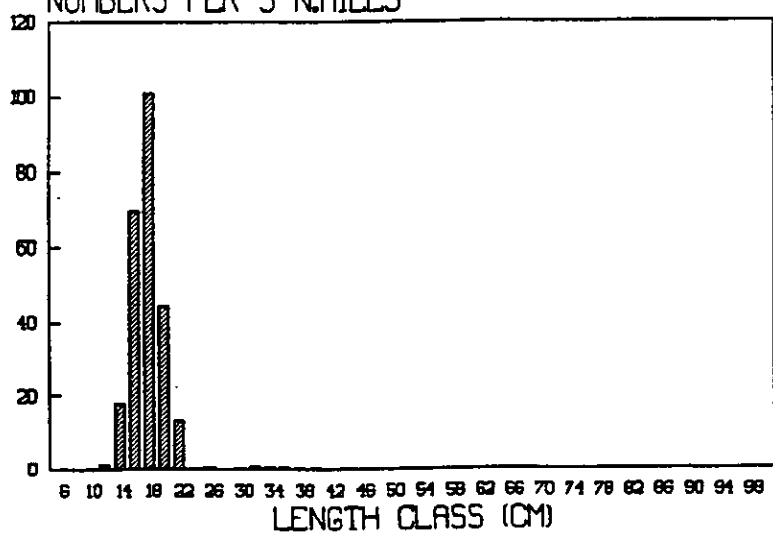


Fig. 3 Mean length frequencies of cod, whiting and haddock during cruise LF0595, averaged over survey strata 1-7.

FAULTS REPORT

1. The upright freezer in fish lab does not have a secure door latch and is not secured properly to the wall, and is a hazard in its present condition. A replacement freezer is required.
2. The floor tiles in the fish lab close to the exit to the trawl deck are cracked. Water is seeping through and this may be the cause of a bad smell in the adjoining room.
3. Water temperature in the showers was too low at the start of the cruise. The thermostat was adjusted by the engineers.
4. Clutch disengagement on port trawl winch (see main Cruise report): requires overhaul and lubrication.

All other aspects of the cruise went smoothly and without fault.

Signed:

M. J. Armstrong

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SIC

[Signature]

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Ship's Master

Date: *12-3-95*