CRUISE REPORT: CRUISE LF4096 DEMERSAL FISH SURVEY

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

DATES: 30 September - 11 October 1996

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 abundance indices of whiting, haddock and cod for use at ICES Working Groups.
3. To examine geographic patterns of infection of whiting and cod by external parasites.

PERSONNEL

M Dickey-Collas	DANI	SIC
C. Burns	DANI	
M.Livingstone	DANI	
M. McAliskey	DANI	
W.McCurdy	DANI	
J.Peel	DANI	

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 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, maturity stage and for removal of otoliths for ageing. The level of infestation of whiting and cod by external parasites was estimated from each biological sample and also, in the case of whiting, from the length-frequency sample at each station.
For the purposes of analysis, the survey area was divided into seven strata defined by depth and substratum, as shown in Fig. 1.

CRUISE NARRATIVE

Monday 30 September
Lough Foyle left Belfast Harbour at 06:00 and proceeded towards station 35. A comprehensive safety demonstration was given before departure by the Chief Officer. Stations 35, 86, 83, 81, 101 and 17 were sampled.

Tuesday 1 October
Five trawl stations were completed (100, 97, 46, 99 and 48). The ship anchored off the Isle of Man overnight.

Wednesday 2 October
Trawl stations 51, 96, 216, 88, 70 and 71 were completed in increasing southerly winds.

Thursday 3 October
The south-westerly winds increased in strength to 25-30 mph so the inshore stations 75, 208, 73 and 79 were sampled.

Friday 4 October
The three remaining inshore stations were completed (92, 93 and 94) and the vessel berthed in Dublin for the mid-cruise break.

Sunday 6 October
The winds dropped and stations 56, 90 and 103 were completed as the vessel headed towards the Eastern Irish Sea.

Monday 7 October
The remaining stations to the south of the Isle of Man were completed (50, 105, 102 and 77). The ship lay at anchor off the Welsh coast overnight.

Tuesday 8 October
Four stations north of Wales were sampled (245, 246, 249 and 243). At 19:00, the ship headed to the Douglas Bank herring spawning ground to carry out an acoustic assessment of the herring spawning biomass. However due to a fault (thought to be in the cable connection) the assessment could not take place. The ship spent the night in Laxey Bay.

Wednesday 9 October
Stations 76, 242, 250, 259 and 258 were completed in good conditions.

Thursday 10 October
Four remaining stations were carried out (257, 64, 256 and 63), and the ship headed for Belfast. The ship berthed at 21:00 in Belfast.

Friday 11 October
The vessel was unloaded by scientific staff.

WORK COMPLETED

A total of 44 valid hauls were completed (Fig. 1). Positions of trawl stations are given in Table 1. A total of 554,663 fish were caught, making a total catch of 18.9 tonnes over the two weeks.

Length measures were carried out on all fish species at each station. In addition, a total of 146 cod, 1042 whiting, 300 haddock and 70 hake were analysed for length, mass and maturity stage. Two

otoliths were taken from each of these fish for ageing. Each cod and whiting sampled for age was inspected for external parasites. The whiting length frequency samples were also screened for parasites.

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. It is clear that the sprat catches throughout the cruise were low, whilst stratum 7 appeared to have high levels of mature poor cod (Figure 2). A strong year class of 0-group haddock dominated the in the western Irish Sea catches (Figure 3, Table 3). Length distributions of whiting show the importance of the western Irish Sea as a nursery ground for young whiting and the higher numbers of large fish found in the Eastern Irish Sea (Figure 4).

Data collected during cruise LF4096 will be incorporated in the stock assessments of Irish Sea cod, whiting and haddock at the ICES Northern Shelf Working Group in June 1997.

ACKNOWLEDGMENTS

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 and proficient work throughout the cruise. Their professionalism and ardor were exemplary.

Signed:

Scientist - in charge: Mark Carlos date 10/10/96.

Ships master: date 10 10 96.

Head, AESD Aquatic Systems: date

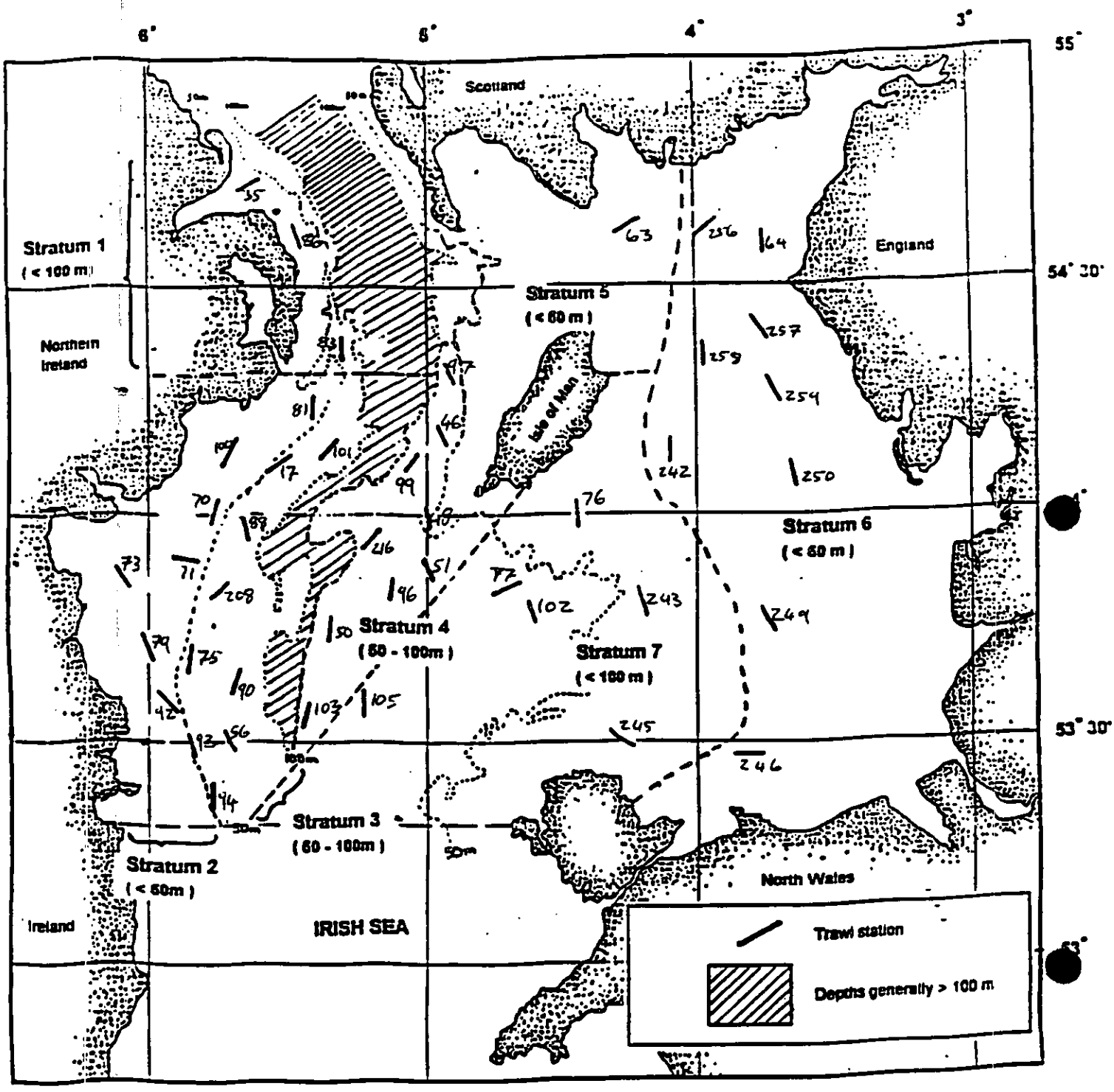


Fig. 1 Trawl stations fished during DANI R.V. *Lough Foyle* groundfish surveys

Key to strata:

1. Irish coast (N), < 100m. Mixed sediments
2. Irish coast, < 60m. 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.

Table 1 **Details of trawls during cruise LF4096** **(Time in G.M.T.)**

Date	Station	Time shot	Shooting position		Hauling position		Mean Depth (m)	Distance towed (nm)
			Latitude	Longitude	Latitude	Longitude		
30 Sept.	35	06h.32	54, 43.14	5, 41.28	54, 43.65	5, 38.73	15	1.5
	86	08h.53	54, 37.13	5, 27.28	54, 34.14	5, 24.91	40	3.0
	83	11h.21	54, 23.20	5, 18.09	54, 20.20	5, 16.90	90	3.0
	81	13h.35	54, 15.22	5, 22.94	54, 12.58	5, 24.28	48	2.9
	101	15h.32	54, 08.03	5, 19.50	54, 05.04	5, 18.67	107	3.0
	17	17h.47	54, 07.39	5, 31.39	54, 08.78	5, 35.97	39	3.0
01 Oct.	100	06h.27	54, 10.99	5, 40.85	54, 08.00	5, 40.83	44	3.0
	97	10h.27	54, 20.31	4, 55.27	54, 17.00	4, 53.00	75	3.0
	46	12h.24	54, 12.34	4, 58.53	54, 09.52	4, 56.88	86	3.0
	99	14h.12	54, 07.43	5, 01.10	54, 06.91	5, 02.57	78	1.5
	48	15h.52	54, 00.77	4, 59.81	53, 57.82	4, 58.34	54	3.0
02 Oct.	51	06h.40	53, 51.60	4, 58.72	53, 54.01	5, 01.75	70	3.0
	96	08h.24	53, 52.29	5, 06.24	53, 49.51	5, 08.13	62	3.0
	216	10h.22	53, 54.49	5, 14.36	53, 57.10	5, 11.89	74	3.0
	88	13h.21	53, 57.57	5, 38.49	53, 59.82	5, 42.02	68	3.0
	70	15h.02	54, 02.22	5, 45.00	53, 59.17	5, 45.71	41	3.0
	71	17h.05	53, 53.18	5, 50.80	53, 54.22	5, 55.62	45	3.0
03 Oct.	75	07h.02	53, 40.39	5, 49.69	53, 43.34	5, 50.38	53	3.0
	208	08h.59	53, 48.71	5, 46.88	53, 51.49	5, 45.01	56	3.0
	73	11h.48	53, 51.68	6, 04.87	53, 49.12	6, 02.12	30	3.0
	79	14h.05	53, 42.97	5, 56.21	53, 41.50	6, 00.83	36	3.0
04 Oct.	92	06h.21	53, 37.00	5, 56.56	53, 35.61	5, 52.06	45	3.0
	93	08h.11	53, 31.57	5, 51.18	53, 28.75	5, 49.34	53	3.0
	94	10h.09	53, 24.60	5, 47.65	53, 22.07	5, 45.10	65	3.0
06 Oct.	56	10h.09	53, 30.07	5, 38.50	53, 30.47	5, 43.12	74	3.0
	90	12h.16	53, 36.35	5, 41.24	53, 39.30	5, 40.60	83	3.0
	103	15h.10	53, 33.35	5, 25.84	53, 36.12	5, 23.17	85	3.0
07 Oct.	50	06h.23	53, 46.11	5, 19.82	53, 43.35	5, 21.77	80	3.0
	105	08h.51	53, 40.88	5, 06.67	53, 42.58	5, 02.58	73	3.0
	102	11h.56	53, 44.18	4, 38.87	53, 46.97	4, 40.80	59	3.0
	77	13h.56	53, 48.46	4, 44.95	53, 50.57	4, 41.20	81	3.0
08 Oct.	245	06h.24	53, 31.45	4, 16.03	53, 29.83	4, 11.69	44	3.0
	246	09h.04	53, 28.66	3, 49.03	53, 29.16	3, 43.92	34	3.0
	249	12h.09	53, 46.31	3, 41.55	53, 48.52	3, 45.15	34	3.0
	243	15h. 21	53, 47.07	4, 06.92	53, 49.15	4, 10.60	45	3.0
09 Oct.	76	06h.24	54, 00.85	4, 24.17	53, 59.67	4, 27.94	46	2.6
	242	09h.30	54, 04.63	4, 02.44	54, 07.64	4, 02.69	35	3.0
	250	12h.24	54, 03.42	3, 37.71	54, 06.14	3, 39.83	29	3.0
	259	15h.10	54, 15.39	3, 42.03	54, 18.29	3, 43.15	33	3.0
	258	17h.11	54, 19.00	3, 54.98	54, 21.80	3, 56.51	37	3.0
10 Oct.	257	06h.18	54, 22.82	3, 43.22	54, 25.60	3, 45.41	27	3.0
	64	08h.40	54, 34.45	3, 45.55	54, 37.02	3, 43.22	22	3.0
	256	11h.04	54, 38.16	3, 55.58	54, 36.68	4, 00.32	34	3.0
	63	12h. 57	54, 38.08	4, 11.02	54, 36.58	4, 15.70	56	3.1

Table 2 Catches of selected species during cruise LF4096 in kg per tow, by survey stratum.

STRATUM 1	Stn. 35	Stn. 86	Stn. 83
Cod	1.36	31.50	
Whiting	103.29	102.35	43.01
Hake			
Haddock	109.93	3.45	14.96
Norway Pout		0.06	12.99
Poor cod	7.51	13.53	4.81
Herring	19.71		0.27
Sprat	132.77		0.52
Plaice	0.61	1.87	0.18
Dab	0.79	2.24	
Anglerfish	1.96	0.54	8.09
Gurnards	0.56		0.03
Less. sp. dogfish	5.88	19.50	16.62
Nephrops			0.23

STRATUM 2	Stn. 100	Stn. 70	Stn. 71	Stn. 73	Stn. 79	Stn. 81	Stn. 92
Cod	1.89	1.88	0.10		0.29	0.02	0.41
Whiting	44.21	51.24	191.65	129.12	121.06	210.87	189.74
Hake		1.65	0.28		0.11	2.19	0.47
Haddock	171.47	454.14	20.88	50.16	122.36	24.30	283.78
Norway Pout		0.88	35.93	11.21	18.88	44.07	19.55
Poor cod					1.34	2.09	1.86
Herring	0.63	0.54	0.02	8.59	6.16	0.33	14.86
Sprat	0.06	1.42	0.68	123.14	0.13	0.32	
Plaice	72.66	5.09	7.49		3.19	1.71	32.66
Dab	41.06	12.73	2.44	0.73	14.90	0.66	10.49
Anglerfish	0.68	4.28	11.31		16.47	9.12	5.05
Gurnards	2.41	1.40	2.42	0.01	2.35	1.48	1.48
Less. sp. dogfish	3.03	0.51				2.19	2.50
Nephrops	0.40	0.05	28.39	0.91	24.86	20.37	19.34

STRATUM 3	Stn. 101	Stn. 17	Stn. 208	Stn. 75	Stn.88	Stn. 93	Stn. 94	Stn. 90	Stn. 56
Cod	0.83	0.02	0.09	0.95		3.11	8.51	4.30	9.08
Whiting	164.21	252.31	321.85	184.23	403.63	219.68	250.49	170.77	181.52
Hake	3.37	4.05	0.86	1.11	2.34			0.58	
Haddock	5.99	84.02	68.88	18.48	31.91	611.10	1022.72	12.52	126.99
Norway Pout	29.95	30.29	100.87	35.44	141.04	39.54	85.95	38.77	21.35
Poor cod	7.66	14.65		0.50	0.25	10.68	6.52	1.14	3.21
Herring	0.22	0.28	20.39	5.14	3.90	13.14	0.71	6.23	0.33
Sprat	0.05		6.37	0.68	26.35			3.48	1.81
Plaice	0.01	13.45	0.96	1.11	1.50	12.64	144.27	0.26	12.74
Dab		3.33	0.10	0.30	0.55	6.34	2.82		0.81
Anglerfish	2.42	4.37		0.16	0.74	10.90	2.42	10.87	
Gurnards	0.70	3.23	1.03	1.21	2.89	4.39	0.68	0.05	1.59
Less. sp. dogfish	0.96	10.65	1.59		2.82	3.63	27.32	0.72	
Nephrops		26.72	1.27	26.34	1.01	3.96	0.29	17.00	26.04

Table 2 continued

STRATUM 4	Stn. 216	Stn. 46	Stn. 48	Stn. 51	Stn. 96	Stn.97	Stn. 99	Stn. 50	Stn. 103
Cod				6.33	0.15	5.81	2.54	2.69	20.01
Whiting	113.45	391.05	328.12	238.77	239.89	355.64	68.16	236.76	647.97
Hake	0.71	1.89	0.36	0.32		1.34	1.46		0.43
Haddock	25.90	23.97	150.52	195.48	40.89	46.31	104.19	26.63	80.64
Norway Pout	3.68	33.51	9.05	4.03	12.48	73.83	46.58	32.76	120.18
Poor cod	1.91	4.37	43.57	18.20	9.44	5.68	27.59	1.60	3.34
Herring	0.11			0.22	0.34	0.47	0.28		
Sprat	0.01				0.03	0.03			
Plaice	1.26		0.13	19.57	3.70	0.40			1.59
Dab	0.34		0.90		0.85	0.66			0.96
Anglerfish		0.23	7.70			5.24	5.03	1.09	
Gurnards	0.87	0.00	10.34	5.70	3.01	0.24	1.35	0.82	3.93
Less. sp. dogfish			14.53	8.19	20.18	3.11	0.74	2.33	7.98
Nephrops	29.67	20.76	0.55	11.61	11.43	25.18	11.85	38.25	1.18

STRATUM 6	Stn. 256	Stn. 64	Stn. 257	Stn. 258	Stn. 259	Stn. 242	Stn. 250	Stn. 249	Stn. 246
Cod	0.21	5.77	0.74	2.92	0.49	8.18	0.79	3.69	1.32
Whiting	284.64	240.70	105.59	224.56	170.15	4.12	194.23	38.60	27.68
Hake						0.86		0.26	
Haddock	20.90					2.50		1.69	
Norway Pout	0.14			3.07	0.37				
Poor cod	6.38	0.50	0.94	2.64	4.65	10.65	0.95	0.02	
Herring	0.03	2.39	4.51	0.29	2.64	0.11	10.41	0.04	0.25
Sprat	0.04	2.97	0.20	0.99	2.45		2.97	0.01	
Plaice	8.80	35.71		3.74	0.92	8.94	29.83	8.65	38.88
Dab	3.71	39.72	0.42	6.81	0.88	1.37	4.94	0.89	0.74
Anglerfish		0.44				2.93		2.73	
Gurnards	5.74	7.85	0.96	4.99	4.72	27.94	2.89	7.59	43.39
Less. sp. dogfish	15.15	6.87	20.18	2.41	12.14	168.70		103.60	460.40
Nephrops			1.24	1.75	11.54		0.17		

STRATUM 7	Stn. 105	Stn. 77	Stn. 102	Stn. 76	Stn. 243	Stn. 245
Cod	9.71	1.92	8.09		3.61	25.92
Whiting	188.00	94.57	173.00	0.85	43.27	31.86
Hake	2.30	2.47		2.47	2.60	1.25
Haddock	69.17	107.30	21.73		0.03	
Norway Pout	17.14	1.15	28.27		0.04	
Poor cod	7.08	33.01	44.25	222.60	30.47	137.80
Herring	0.06		0.05			
Sprat						0.02
Plaice	24.60	14.78	12.34		2.23	
Dab	2.43	2.96	2.86		0.25	0.07
Anglerfish		12.50	2.43	3.49	10.56	
Gurnards	5.49	7.11	4.35	7.51	24.20	41.44
Less. sp. dogfish	14.82	30.73	50.08	8.44	48.43	42.30
Nephrops	0.44					

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).

STRATUM	STATION	WHITING		HADDOCK	
		below MLS	above MLS	below MLS	above MLS
1	35	103.3	0.0	109.9	0.0
	86	75.9	26.5	3.4	0.0
	83	33.0	10.0	15.0	0.0
2	81	210.4	0.5	24.3	0.0
	100	44.0	0.3	159.6	11.9
	70	48.5	2.7	242.3	29.8
	71	191.4	0.2	20.9	0.0
	73	129.1	0.0	50.2	0.0
	79	119.9	1.1	116.6	5.8
	92	178.9	10.8	167.3	116.6
3	101	128.0	36.2	6.0	0.0
	17	240.4	11.9	64.0	20.1
	88	394.4	9.2	14.5	17.4
	208	318.1	3.8	6.4	62.5
	75	178.5	5.8	17.0	1.5
	90	131.4	39.4	9.9	2.6
	56	178.8	2.7	150.6	31.0
	93	209.7	10.0	394.9	216.2
	94	250.5	0.0	994.4	28.4
4	97	289.1	66.5	46.3	0.0
	46	311.4	79.6	24.0	0.0
	99	51.4	16.7	79.0	25.2
	48	282.9	45.2	98.0	52.5
	51	191.5	47.3	159.1	36.4
	96	227.5	12.4	36.1	4.7
	216	110.0	3.4	23.6	2.3
	50	224.0	12.8	26.6	0.0
	103	589.1	58.9	63.7	17.0
7	105	171.4	16.6	21.1	48.1
	77	24.2	70.4	83.9	23.4
	243	14.6	28.7	0.0	0.0
	102	143.7	29.3	21.4	0.3
	76	0.0	0.8	0.0	0.0
	245	1.4	30.5	0.0	0.0
6	246	1.4	26.3	0.0	0.0
	242	4.1	34.5	1.7	0.0
	249	0.0	4.1	0.0	2.5
	250	108.2	86.0	0.0	0.0
	258	175.0	49.5	0.0	0.0
	259	137.4	32.8	0.0	0.0
	257	58.6	47.0	0.0	0.0
	64	189.5	95.2	0.0	0.0
	256	148.1	92.6	20.9	0.0
Mean: Strata 2 - 4		209.2	19.1	119.8	27.3

Figure 2 Mean catches of selected species (kg per tow) by stratum on LF4096

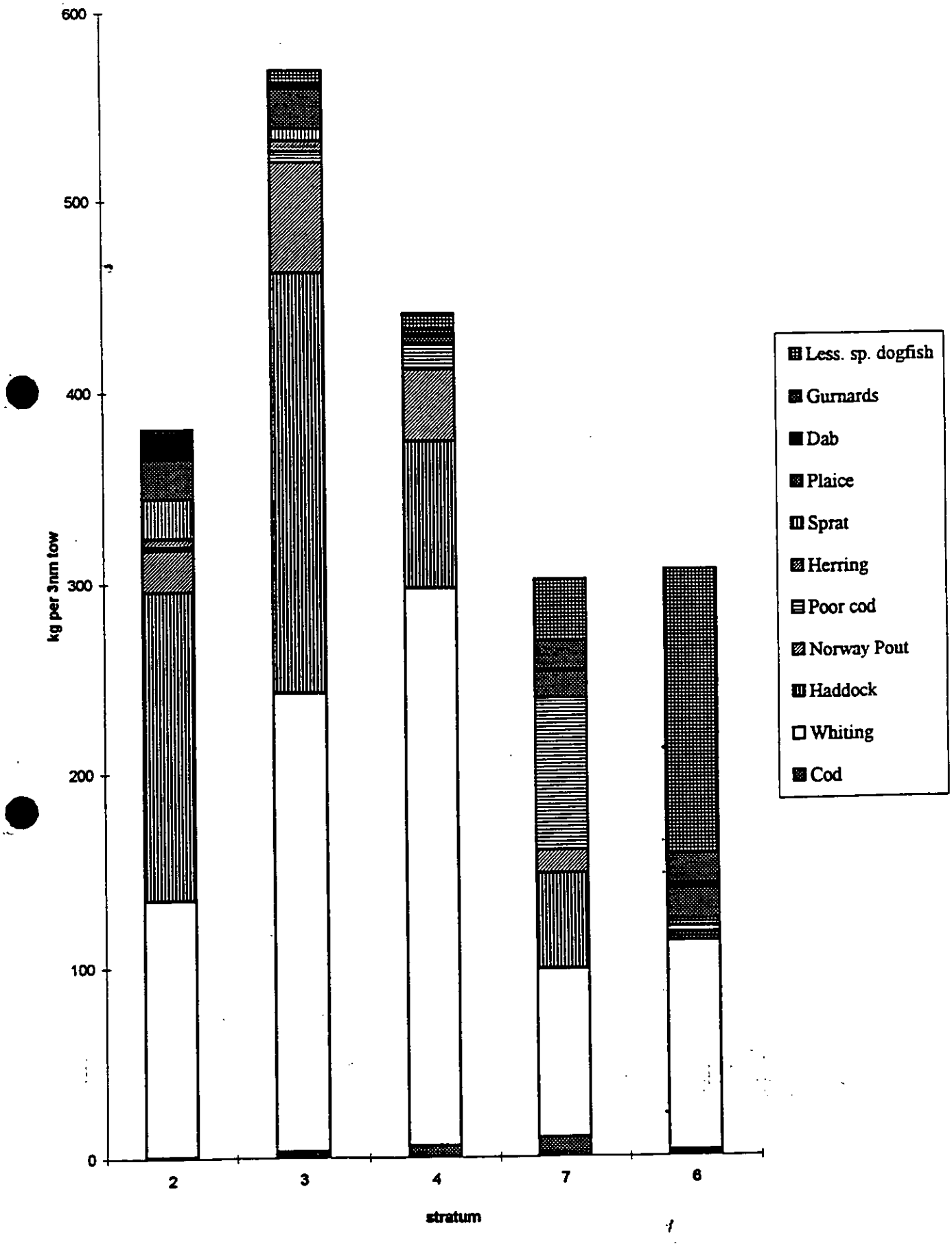
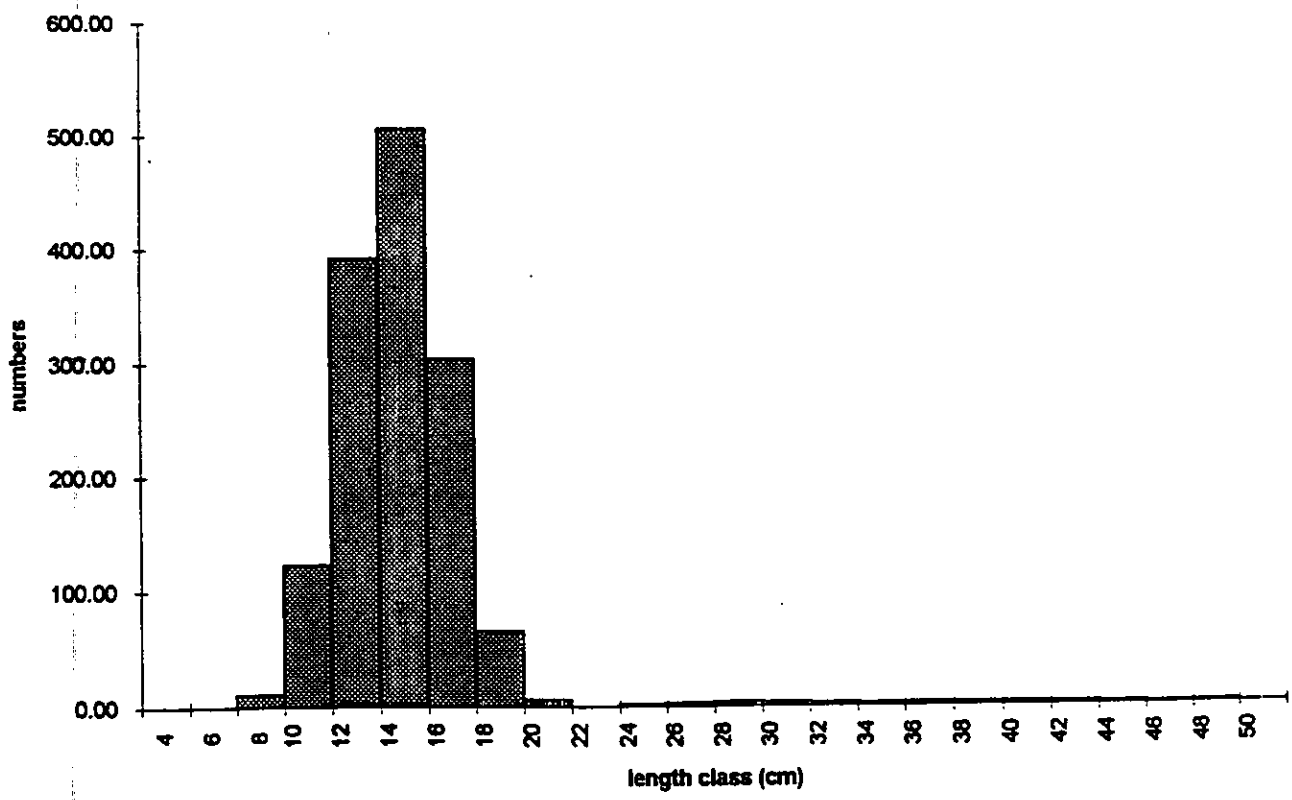


Figure 3 Length frequency of haddock caught during LF4096



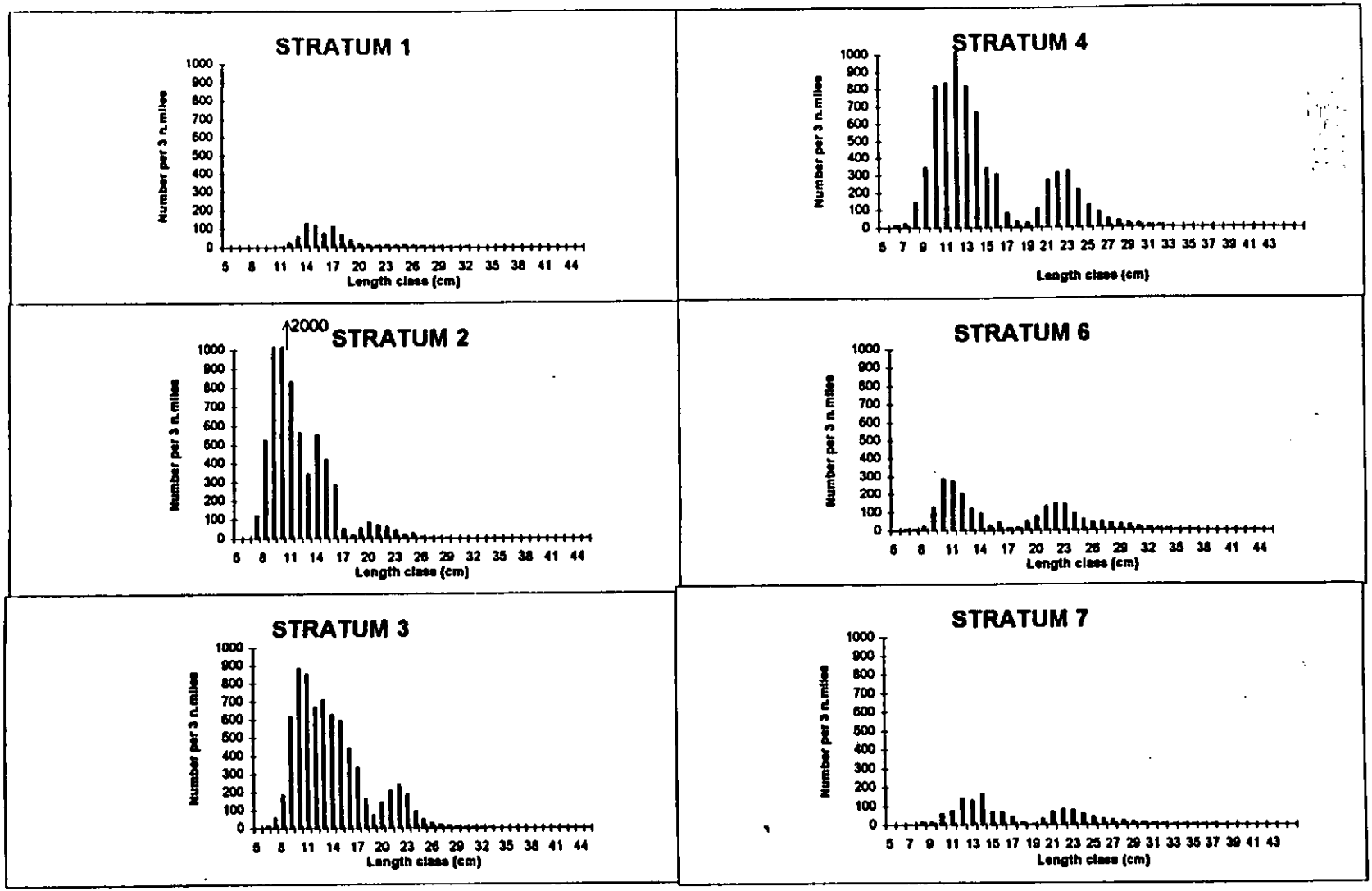


Fig. 4 Length distributions of whiting in strata 1 - 7 during LF4096

FIGURE 1

Map showing location of stations