

CRUISE REPORT: CRUISE LF4197 DEMERSAL FISH SURVEY

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

DATES: 8 - 16 October 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 in stock assessment.
3. To estimate the abundance of sprat and herring in the western and eastern Irish Sea using acoustics.
4. To quantify external parasite loads in whiting and cod, by area.
5. To collect samples of flatfish for feeding studies.
6. To record quantities of marine litter in trawl catches.

PERSONNEL

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

¹ Disembarked 11 October

² Embarked 11 October

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.

resent survey (Fig. 4). The highest catch-rates of this year class were recorded in the western Irish Sea to the south of Dundalk Bay.

As in previous surveys, the whiting catches were dominated by young fish with length modes at 15 and 13 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. 3).

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: date.....

Ships master: date.....

Head, AESD Aquatic Systems:..... date.....

Table 1 Details of trawls during cruise LF4197

(Time in G.M.T.)

Date	Station	Time shot	Shooting position		Hauling position		Mean Depth (m)	Distance towed (nm)
			Latitude	Longitude	Latitude	Longitude		
06-Oct	35	6h.33	54 42.9	5 41.3	54 43.7	5 36.4	15	3.00
	86	8h.42	54 37.2	5 26.8	54 34.6	5 25.4	37	2.80
	83	12h.41	54 23.0	5 17.8	54 20.1	5 16.8	84	3.00
	97	14h.28	54 20.6	4 55.4	54 17.7	4 54.1	87	3.00
	46	16h.28	54 13.3	4 56.2	54 10.7	4 58.7	82	3.00
07-Oct	99	06h.29	54 7.6	5 1.3	54 5.1	5 4.1	75	3.00
	48	08h.17	54 1.0	4 59.8	53 58.0	4 58.2	52	3.00
	51	10h.02	53 53.7	4 59.4	53 50.9	4 57.7	68	3.00
	96	13h.05	53 49.5	5 4.9	53 52.6	5 6.2	70	3.00
	216	15h.36	53 56.2	5 12.3	53 53.8	5 15.3	74	3.00
08-Oct	100	07h.02	54 11.0	5 40.6	54 8.1	5 40.8	25	3.00
	17	10h.01	54 8.2	5 31.5	54 5.1	5 31.7	57	3.00
	81	12h.07	54 12.0	5 23.8	54 14.9	5 23.6	50	3.00
	101	14h.15	54 8.0	5 19.5	54 5.0	5 18.7	100	3.00
09-Oct	73	06h.20	53 51.3	6 4.9	53 48.8	6 1.8	29	3.00
	71	08h.10	53 53.2	5 55.5	53 54.2	5 50.6	40	3.00
	70	10h.22	54 1.7	5 45.5	53 58.7	5 44.8	41	3.00
	88	12h.07	53 59.5	5 39.8	53 56.8	5 42.2	60	3.00
	208	14h.10	53 50.3	5 45.8	53 47.2	5 47.3	60	3.20
	75	16h.01	53 42.3	5 50.6	53 39.4	5 52.0	55	3.00
10-Oct	79	06h.38	53 43.4	6 0.7	53 40.7	5 57.9	33	3.00
	92	08h.39	53 36.6	5 55.9	53 35.0	5 51.5	46	3.00
	93	11h.09	53 31.2	5 52.0	53 29.2	5 48.2	61	3.00
	94	13h.40	53 24.8	5 47.6	53 22.2	5 45.4	70	3.00
12-Oct	56	12h.49	53 30.1	5 38.0	53 29.8	5 43.1	81	3.07
	90	15h.00	53 36.6	5 40.9	53 39.5	5 42.4	81	3.02
13-Oct	50	07h.15	53 46.3	5 21.7	53 43.3	5 20.7	87	3.00
	103	09h.28	53 35.8	5 23.5	53 33.0	5 25.6	85	3.00
	105	12h.50	53 40.5	5 6.6	53 42.6	5 3.1	73	3.00
	77	15h.33	53 48.7	4 44.3	53 50.8	4 40.8	84	3.00
14-Oct	76	06h.43	54 1.1	4 24.3	54 0.1	4 26.4	46	1.50
	102	09h.25	53 46.7	4 40.6	53 43.9	4 38.8	63	3.00
	243	12h.27	53 49.2	4 10.9	53 47.2	4 7.1	45	3.00
	245	15h.28	53 31.1	4 16.3	53 30.0	4 11.6	40	3.00
15-Oct	246	06h.37	53 28.6	3 48.5	53 29.2	3 43.5	33	3.00
	249	09h.29	53 46.1	3 41.0	53 48.0	3 44.9	39	3.00
	250	12h.16	54 3.4	3 37.4	54 6.1	3 39.8	30	3.03
	259	14h.16	54 15.0	3 42.1	54 17.9	3 43.3	33	3.00
	257	16h.00	54 23.2	3 44.3	54 25.9	3 46.2	25	3.00
16-Oct	242	06h.46	54 4.6	4 1.3	54 7.5	4 2.4	33	3.00
	258	09h.06	54 19.0	3 57.2	54 22.0	3 57.2	39	3.00
	64	11h.38	54 34.1	3 46.3	54 36.9	3 44.8	26	3.00
	256	13h.35	54 37.9	3 55.4	54 37.1	4 0.6	36	3.06
	63	15h.33	54 37.0	4 10.9	54 35.9	4 15.6	52	3.00

Table 2

Catches of selected species during cruise LF4197 in kg per tow, by survey stratum.

STRATUM 1	Stn. 35	Stn. 86	Stn. 83
Cod	2.22	31.54	2.56
Whiting	222.50	450.61	80.60
Hake	0.00	0.00	2.65
Haddock	41.20	45.29	1.17
Norway Pout	0.00	0.00	12.36
Poor cod	5.21	13.67	37.09
Herring	534.90	0.00	0.30
Sprat	46.57	0.00	0.48
Plaice	2.53	2.92	0.00
Dab	7.18	0.55	0.00
Lemon sole	0.95	12.25	0.00
Anglerfish	7.74	0.91	0.13
Gurnards	1.07	1.79	0.61
Less. sp. dogfish	27.47	19.44	16.39
Nephrops	0.32	0.00	3.37

STRATUM 2	Stn. 81	Stn. 100	Stn. 70	Stn. 71	Stn. 73	Stn. 79	Stn. 92
Cod	0.00	0.32	0.00	0.00	0.00	0.28	1.21
Whiting	310.10	186.51	180.10	118.20	263.90	821.20	670.70
Hake	1.15	0.00	1.61	0.00	0.00	0.00	0.00
Haddock	15.52	661.30	143.67	3.11	0.19	183.60	1004.00
Norway Pout	5.73	0.00	0.00	1.45	0.00	7.18	30.84
Poor cod	30.55	0.66	22.96	1.18	1.65	26.54	10.74
Herring	0.21	0.98	1.63	1.98	0.17	7.65	40.38
Sprat	105.41	15.25	38.45	352.20	91.86	44.00	0.00
Plaice	0.34	46.64	0.33	4.08	0.54	70.82	39.56
Dab	0.46	23.38	0.48	0.73	14.54	37.36	24.50
Lemon sole	0.00	0.00	0.88	0.00	0.00	1.13	0.00
Anglerfish	0.97	1.78	0.00	0.00	0.00	0.00	0.00
Gurnards	0.91	2.03	0.33	0.89	1.74	6.16	4.52
Less. sp. dogfish	5.23	6.47	2.14	8.82	7.13	24.93	24.99
Nephrops	28.44	0.00	0.00	1.10	4.26	0.00	10.30

STRATUM 3	Stn. 101	Stn. 17	Stn. 88	Stn. 208	Stn. 75	Stn. 90	Stn. 56	Stn. 93	Stn. 94
Cod	3.27	0.00	0.04	0.00	0.00	0.00	5.44	3.49	2.19
Whiting	33.77	143.43	82.36	359.20	364.49	127.70	175.26	455.31	347.10
Hake	0.02	0.01	0.01	2.47	0.00	0.01	0.02	0.00	0.00
Haddock	2.00	2.94	18.27	12.19	0.57	0.27	140.83	1188.00	1809.00
Norway Pout	23.48	3.80	37.61	55.59	1.47	20.51	26.40	18.55	8.16
Poor cod	6.08	11.74	4.14	0.65	1.27	2.59	17.72	7.15	6.89
Herring	2.60	5.34	57.36	381.80	17.13	2.10	0.69	7.90	0.15
Sprat	0.00	127.09	44.51	19.20	0.06	1.76	0.02	0.00	0.00
Plaice	0.00	1.49	0.70	1.35	0.29	0.18	36.09	7.39	54.67
Dab	0.00	0.93	0.00	0.25	1.56	0.05	1.12	6.01	8.90
Lemon sole	0.00	0.00	0.00	0.09	0.00	0.00	0.00	4.24	0.00
Anglerfish	1.19	0.39	1.08	2.68	0.00	0.00	0.00	3.00	0.00
Gurnards	0.22	1.11	0.92	3.28	4.18	2.43	36.87	5.53	16.60
Less. sp. dogfish	0.00	10.91	0.95	0.00	0.00	0.00	22.03	19.50	22.81
Nephrops	14.58	8.83	0.52	5.64	6.57	2.19	16.30	3.28	0.12

Table 2 continued

STRATUM 4	Stn. 97	Stn. 46	Stn. 99	Stn. 48	Stn. 216	Stn. 51	Stn. 96	Stn. 50	Stn. 103
Cod	1.94	0.00	0.00	0.84	0.03	5.04	0.26	0.00	6.19
Whiting	278.30	369.60	458.50	34.55	35.21	208.40	360.40	180.60	85.62
Hake	0.01	1.54	0.10	2.06	0.26	0.00	0.00	0.00	0.00
Haddock	4.42	0.07	16.00	126.23	0.02	301.60	18.29	0.03	3.12
Norway Pout	16.48	40.90	56.11	11.19	8.92	38.62	47.10	28.32	11.74
Poor cod	14.16	12.53	18.57	101.77	3.41	23.18	8.62	5.51	10.67
Herring	489.70	161.82	15.38	0.00	1.31	0.00	4.75	1.88	0.60
Sprat	0.16	0.17	0.01	0.00	0.30	0.00	0.07	0.07	0.05
Plaice	0.00	0.00	0.00	0.71	1.64	4.80	3.99	0.00	4.96
Dab	0.00	0.00	0.04	0.00	0.05	1.08	0.24	0.00	0.00
Lemon sole	0.66	0.00	0.32	2.87	0.49	2.86	0.00	0.00	0.00
Anglerfish	0.64	0.00	0.00	4.67	0.00	5.36	2.45	0.00	0.00
Gurnards	0.30	1.22	0.00	5.09	3.74	3.56	13.21	1.93	1.84
Less. sp. dogfish	4.12	0.00	22.22	60.11	9.52	16.09	35.90	30.82	19.73
Nephrops	9.99	51.66	26.70	0.57	34.40	3.71	1.17	28.54	0.47

STRATUM 6	Stn. 256	Stn. 64	Stn. 257	Stn. 258	Stn. 259	Stn. 242	Stn. 250	Stn. 249	Stn. 246
Cod	6.97	5.21	0.04	1.93	0.00	19.02	7.34	39.54	23.63
Whiting	86.17	296.80	176.90	626.80	184.50	20.13	771.40	97.65	25.86
Hake	0.00	0.00	0.23	0.00	0.00	1.82	0.00	1.89	0.00
Haddock	11.86	0.00	0.00	1.66	0.00	176.00	0.56	4.58	11.05
Norway Pout	0.00	0.00	0.00	5.61	0.04	0.00	0.00	0.00	0.00
Poor cod	10.53	1.00	13.03	31.80	14.06	15.99	16.23	0.17	16.00
Herring	0.00	0.86	2.01	0.47	3.95	0.00	3.31	0.74	0.00
Sprat	0.02	1.45	3.49	0.51	29.90	0.00	0.39	0.16	0.00
Plaice	22.17	39.71	0.64	12.98	0.54	5.90	20.27	9.75	12.12
Dab	41.70	22.13	1.24	64.22	3.82	0.47	29.40	4.73	0.45
Lemon sole	0.00	0.00	0.00	0.00	0.00	1.34	0.00	2.01	2.27
Anglerfish	0.00	0.00	1.42	0.00	0.00	0.00	0.00	0.00	0.00
Gurnards	5.98	1.74	0.58	16.89	0.50	26.86	6.59	9.06	52.72
Less. sp. dogfish	9.89	1.10	20.72	54.17	4.68	71.46	0.00	13.93	321.74
Nephrops	0.01	2.76	5.33	7.36	2.68	0.24	0.05	0.00	0.00

STRATUM 7	Stn. 105	Stn. 77	Stn. 102	Stn. 76	Stn. 243	Stn. 245
Cod	11.45	6.95	21.64	0.00	10.30	46.88
Whiting	196.50	266.40	429.00	0.17	10.59	166.50
Hake	0.00	1.65	4.45	1.06	0.00	0.26
Haddock	16.56	115.50	34.24	0.00	41.40	0.00
Norway Pout	9.04	9.76	32.17	0.00	0.00	0.14
Poor cod	2.63	34.78	15.89	7.51	4.40	32.90
Herring	0.05	0.00	0.02	0.00	0.00	0.00
Sprat	0.00	0.00	0.06	0.00	0.00	0.00
Plaice	7.87	13.74	39.97	0.00	2.50	0.19
Dab	2.27	1.60	10.68	0.00	0.03	0.00
Lemon sole	0.00	3.38	0.37	0.00	1.95	0.00
Anglerfish	0.00	0.00	0.00	3.55	0.00	0.00
Gurnards	2.28	17.96	18.80	3.93	20.46	15.01
Less. sp. dogfish	0.00	19.61	22.84	2.61	18.94	67.98
Nephrops	0.00	0.00	0.00	0.00	0.00	0.00

STRATUM 5	Stn. 63	Stn. 61
		21.86 not
		47.39 fished
		1.20
		51.19
		0.04
		78.00
		0.21
		0.01
		16.43
		2.10
		14.86
		0.74
		39.61
		16.14
		0.00

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 LF4197.

STRATUM	STATION	WHITING		HADDOCK	
		below MLS	above MLS	below MLS	above MLS
1	35	216.8	5.7	40.4	0.8
	86	360.2	90.4	36.3	9.0
	83	75.8	4.8	1.2	0.0
2	81	309.5	0.6	15.5	0.0
	100	176.7	9.8	660.6	0.7
	70	177.8	2.3	138.3	5.4
	71	111.2	7.0	3.1	0.0
	73	263.4	0.5	0.2	0.0
	79	821.2	0.0	183.6	0.0
	92	667.1	3.6	953.3	50.7
3	101	27.5	6.2	0.2	1.8
	17	143.0	0.4	2.9	0.0
	88	81.7	0.7	15.7	2.6
	208	358.7	0.5	12.2	0.0
	75	364.0	0.5	0.6	0.0
	90	124.2	3.5	0.0	0.3
	56	174.1	1.1	117.9	22.4
	93	451.5	3.8	1028.0	160.0
	94	347.1	0.0	928.8	880.2
	4	97	214.1	64.2	2.2
46		317.6	52.0	0.1	0.0
99		388.5	70.0	15.1	0.9
48		10.5	24.0	116.6	9.7
216		34.0	1.2	0.0	0.0
51		189.1	19.3	161.5	140.1
96		322.5	37.9	12.3	5.9
50		176.7	3.9	0.0	0.0
103		85.4	0.2	0.5	2.7
5		63	8.4	38.9	5.1
	61	not fished		not fished	
7	77	119.6	146.8	63.4	52.1
	102	373.1	55.9	29.7	4.6
	76	0.0	0.2	0.0	0.0
	243	3.4	7.2	7.9	33.5
	245	102.1	64.4	0.0	0.0
	105	173.9	22.6	8.2	8.4
6	246	0.9	25.0	3.1	7.9
	249	57.1	40.5	2.5	2.1
	242	2.0	18.2	33.5	142.5
	250	435.5	328.3	0.0	0.6
	258	478.1	148.7	0.8	0.9
	259	105.6	78.9	0.0	0.0
	257	133.0	43.9	0.0	0.0
	256	70.4	14.1	1.9	9.7
	64	239.7	57.1	0.0	0.0
Mean: Strata 2 - 4		253.5	12.5	174.8	51.4

Table 4. Preliminary indices of abundance of 0-group and 1-group cod, whiting and haddock from cruise LF4197, based on length frequency data only. Data are mean numbers caught per 3 nautical miles towed. Indices from previous autumn surveys covering the eastern and western Irish Sea are also given.

SURVEY	COD		WHITING		HADDOCK	
	0-gp	1-gp	0-gp	1-gp	0-gp	1-gp
1992	0.6	10.8	1454	995	1	8
1993	7.9	5.5	1554	425	45	1
1994	13.3	9.5	2450	686	567	11
1995	7.8	12.1	3199	483	17	102
1996	14.8	4.8	2628	605	1433	12
LF4197 1997	4.2	13.0	3242	n/a	161	401

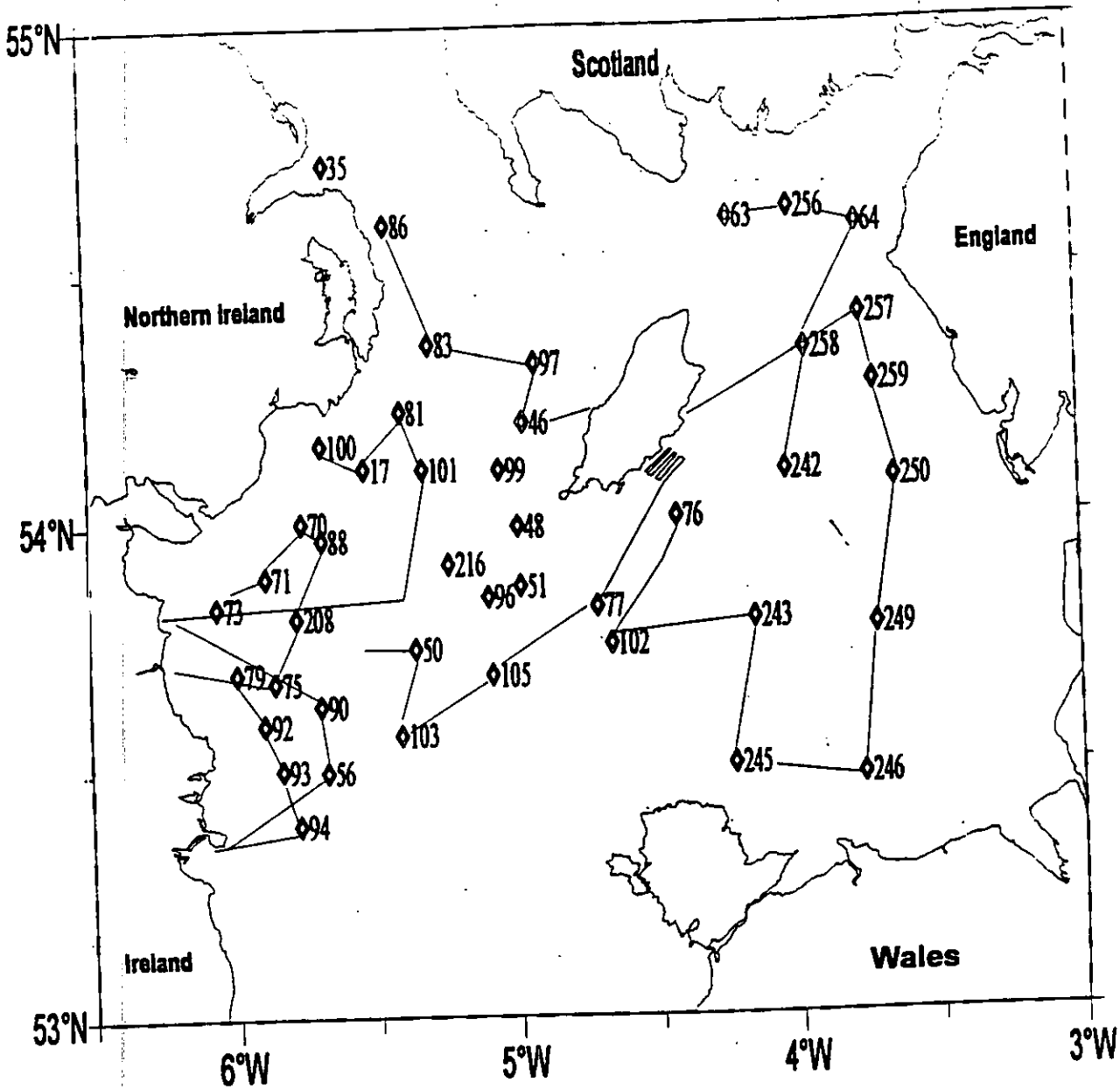


Fig. 1. Trawl positions for cruise LF4197. Sections of cruise track where acoustic data were collected are indicated.

Definition of survey strata referred to in Table 2:

- Stratum 1: Belfast Lough to Strangford Lough: <100m; mixed sediments
- Stratum 2: Irish Coast < 50m. Sand and finer sediments.
- Stratum 3: Irish Coast 50 - 100m. Muddy sediments
- Stratum 4: W and SW Isle of Man, 50 - 100m. Mud and muddy sand.
- Stratum 5: North Isle of Man. <50m. Gravel.
- Stratum 6: Eastern Irish Sea. < 50m. Sand and finer sediments.
- Stratum 7: South IOM. <100m. Mixed gravel and sand.

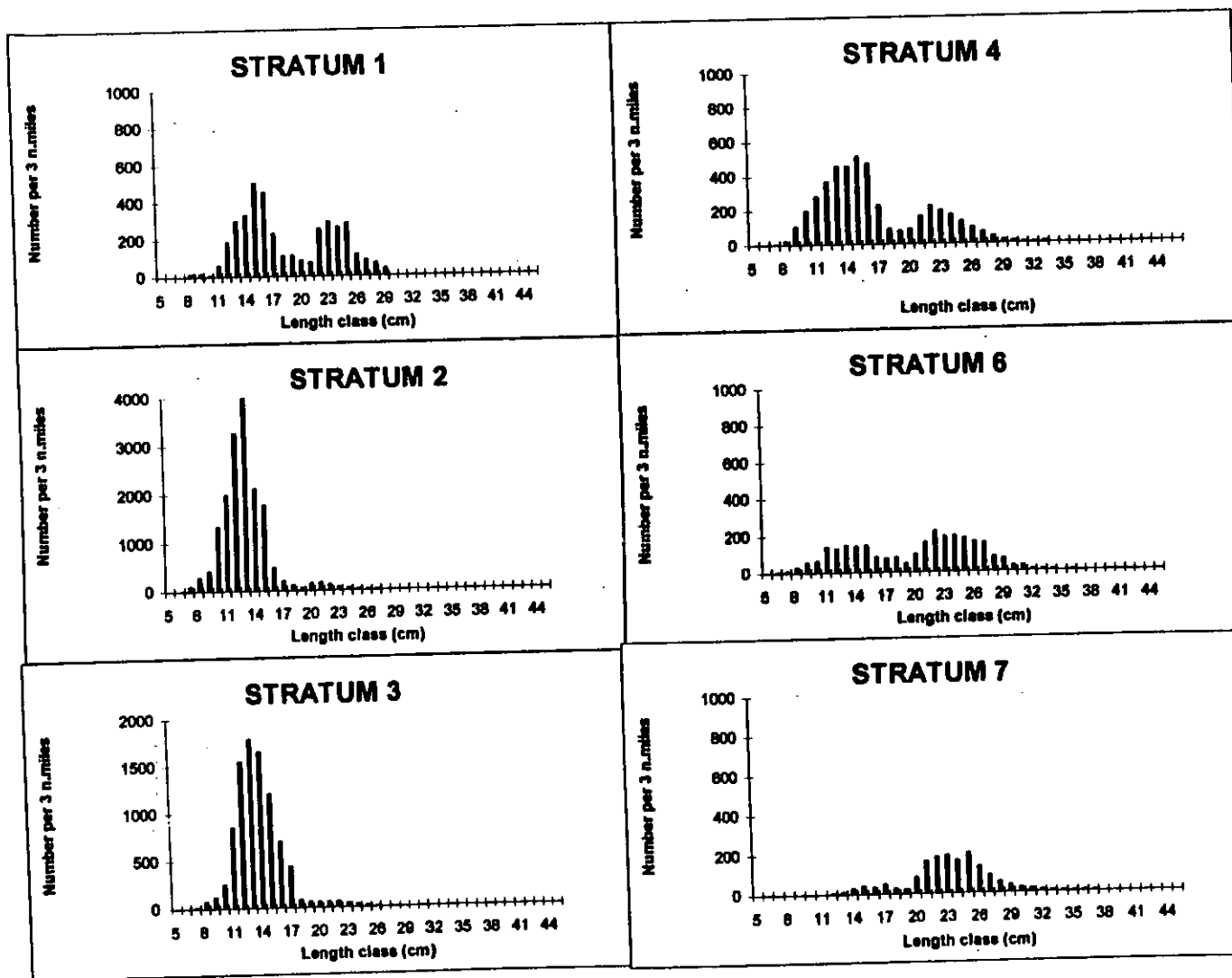


Fig. 2 Length distributions of whiting in strata 1 - 7 during LF4197. (Stratum 5 not shown)
Data are mean numbers caught per 3 nautical miles towed.

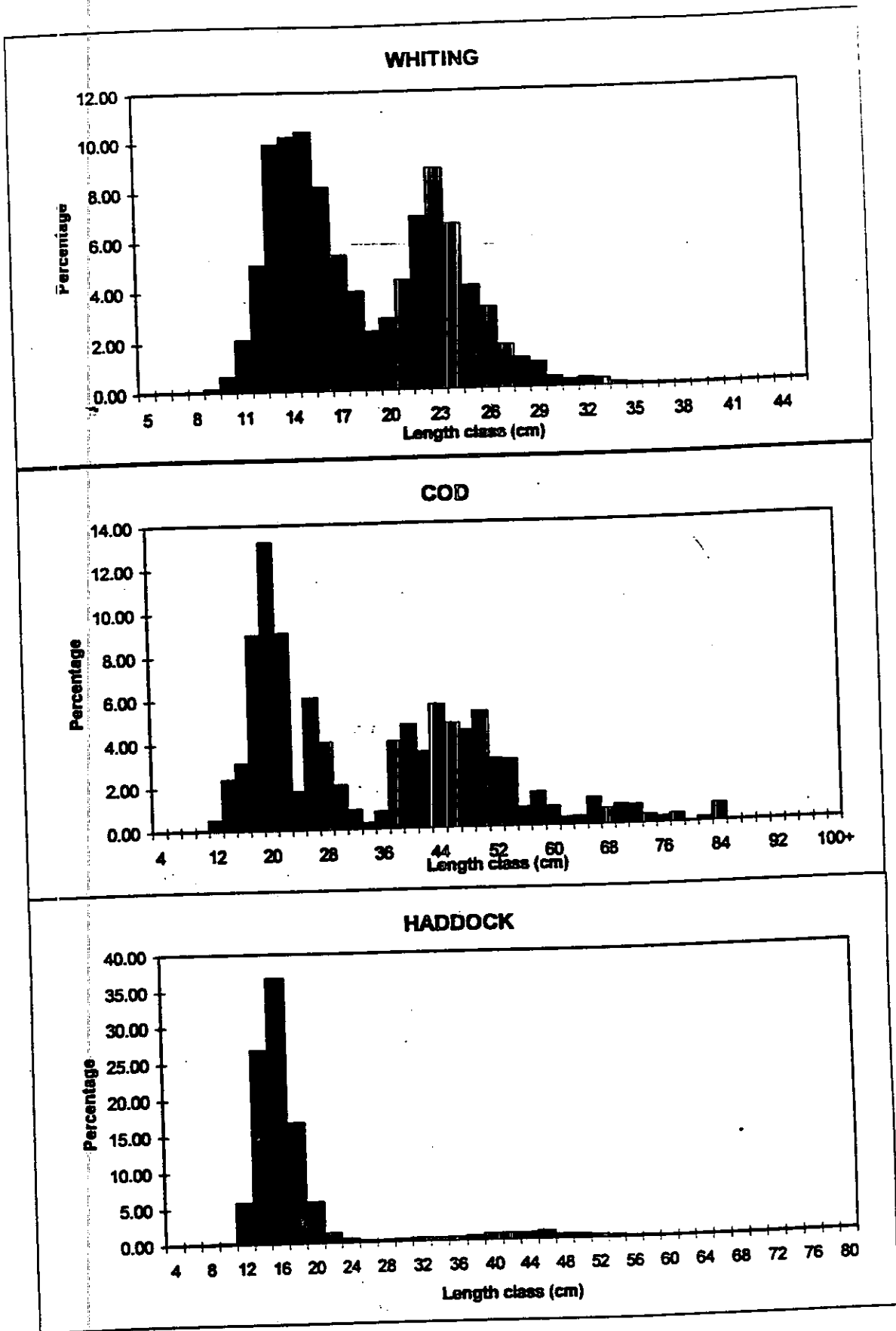


Fig. 3 Average percentage length compositions of whiting, cod and haddock during cruise LF1297