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DEPARTMENT OF AGRICULTURE [NI]
AQUATIC SCIENCES RESEARCH DIVISION

CRUISE REPORT: LF/18/94 DEMERSAL YOUNG FISH SURVEY (SUMMER)

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

DATES: 27 June - 7 July 1994

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

TYPE OF SURVEY: Otter trawl

PERSONNEL:

R. Briggs, [SIC]	DANI	PSO
W. McCurdy,	DANI	SSO
M. McAliskey,	DANI	SO
M. Livingstone,	DANI	SO
J. Peel,	DANI	ASO
C. Burns,	DANI	ASO

P. Newton, CASE Student, Port Erin Marine Lab.
C. Zambujo, ERASMUS Student, Osny France (from 2/07/94)

OBJECTIVES

1. To obtain indices of abundance of juvenile gadoids to facilitate predictions of stock-size and yield of recruited fish in future years;
2. To investigate the diets of predatory fish species in relation to the distribution and relative abundance of their fish prey, with particular emphasis on predation on commercial species;
3. To obtain further information on distribution of different age-classes of fish to facilitate interpretation of data from commercial catches;
4. To retain all '0' group gadoids for future study;
5. To collect samples of sepiolids for a UCC project.
6. To retain all weever fish (*Trachinus vipera*) for a PEML based project.

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 ground-fish 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, hake and haddock were taken for recording of length and mass, and for removal of otoliths for ageing. Stomachs were taken from samples of predatory fish and frozen for analysis on shore.

For the purpose of analysis, the survey area was divided into seven strata defined by depth and substratum as in previous cruises (Figure 1):

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

Although the stations mostly utilise known trawl lanes, it is emphasised that they have a semi-random distribution within each stratum, with greatest emphasis on strata in the western Irish Sea where highest densities of juvenile gadoids are expected.

NARRATIVE

Monday 27 June:
R.V.Lough Foyle departed from Belfast at 06h.45 and proceeded to station 35 at the mouth of Belfast Lough. This was followed by stations 86, 83, 81 and 101. The weather was overcast with a slight southern breeze (10 knots). The night was spent off Peel, Isle of Man.

Tuesday 28 June:
The net was shot at station 97 off the Isle of Man at 06h.58 in a gentle southern breeze. This was followed by stations 46, 99 and 48. The vessel then returned to the Irish coast to anchor for the night off Skerries.

Wednesday 29 June:
Stations 70,71,70,100,17 and 88 were completed off the Irish coast and the vessel returned to Skerries for overnight anchorage.

Thursday 30July:
Nets were shot at station 103 in calm weather conditions at 06h.57 followed by stations 50,216,51,96 and 105. In view of the calm conditions the night was spent drifting on station ready for the next days work.

Friday 1 July:
Continued calm conditions allowed a further five western Irish Sea stations to be completed (208,79,75,92 and 90) before docking into Dublin for the mid cruise break.

Saturday 2 July:
RV Lough Foyle remained in Dublin all day and provided the venue for a meeting with statisticians from DOM and DANI to discuss the results of the EU funded mesh selection project to which data from this cruise will contribute.

Sunday 3 July:
Following the cruise break in Dublin *Lough Foyle* sailed at 09h.00 in a moderate SE breeze. The net was shot at station 94 followed by stations 93 and 56. The ship then proceeded east to spend the night at anchor off Anglesey.

Monday 4 July:
Fishing commenced at the first station, off Anglesea (245) at 06h.45 followed by a steam Northwest through dense fog to station 102. This was followed by stations 77 and 76. Sea conditions were flat calm but foggy. The night was spent at anchor in Laxey Bay off the Isle of Man.

Tuesday 5 July:
The first station of the day was 242 which was hauled at 08h.00 in fine weather conditions. A southern course was then taken in order to fish stations 243 and 246. The final station of the day was 247. The night was spent at anchor off Rhyl, North Wales. As station 247 is in the vicinity of a new gas pipe it is recommended that it be excluded from future surveys.

Wednesday 6 July:
A northerly steam to station 249 where fishing commenced at 07h.00. This was followed by stations 250,259,258 and 257. The weather was overcast with some rain. An overnight anchorage was found off St Bees Head.

Thursday 7 July:
Stations 64, 256 and 63 were completed successfully. Station 61 was attempted but a peak shown on the sounder was considered to be a threat to the net, so the tow was aborted. Lough Foyle then steamed for Belfast, docking at 17.15.

WORK COMPLETED

Forty five valid hauls (1 aborted) were completed from 27 June to 7 July (Figure 1). The position of trawl stations and total catch bulk at each is shown in Table 1. The quantities of selected species caught by stratum is given in Table 2 and the average whiting catch at length per 3nm trawl is presented in Figure 2. Table 3 shows the number of "0" group (<12cm) and marketable sized (≥27cm) whiting at each station. Overall over 1,300kg of catch was sorted and length measurement was carried out on over 40,000 fish. Otoliths were taken from 237 cod, 1073 whiting, 157 haddock and 61 hake. Stomachs were removed from 2,000 whiting and 1,500 other fish species and frozen for analysis of prey. Samples of '0' group gadoids were also frozen for studies of juvenile fish biology. Catches of sepiolids were frozen for a UCC project and all weever fish were retained for a PEML project on weever ecology.

This survey is one of three annual groundfish surveys contributing to the collection of a time-series data-base of fish distribution in north Irish Sea, employing the *Lough Foyle*. Indices of abundance of juvenile whiting and cod will be included in the assessment of these species carried out by the 1995 meeting of the ICES Northern Shelf Working Group. Information on the diet of predatory fish from the analysis of the content of fish stomachs collected during the cruise will contribute towards multispecies assessment of Irish Sea fish stocks. The broad spatial coverage of surveys at three different times of the year (March, June/July and September) will provide valuable data on the seasonal distribution of fish species and indicate regions where potentially high rates of discarding of young fish could be expected. These data will contribute to ongoing EU funded projects on gear selectivity and discarding in the Irish Sea.

ACKNOWLEDGEMENTS

I thank the Master, officers and crew of *MRV Lough Foyle* for their enthusiastic co-operation throughout this very successful cruise. The scientific staff are to be congratulated for their example of effective team work in completing all objectives.

Richard Briggs
Scientist in Charge
7 July 1994

Andrew Niblock
Master

Figure 1

Trawl stations fished during the June/July 1994 groundfish survey.

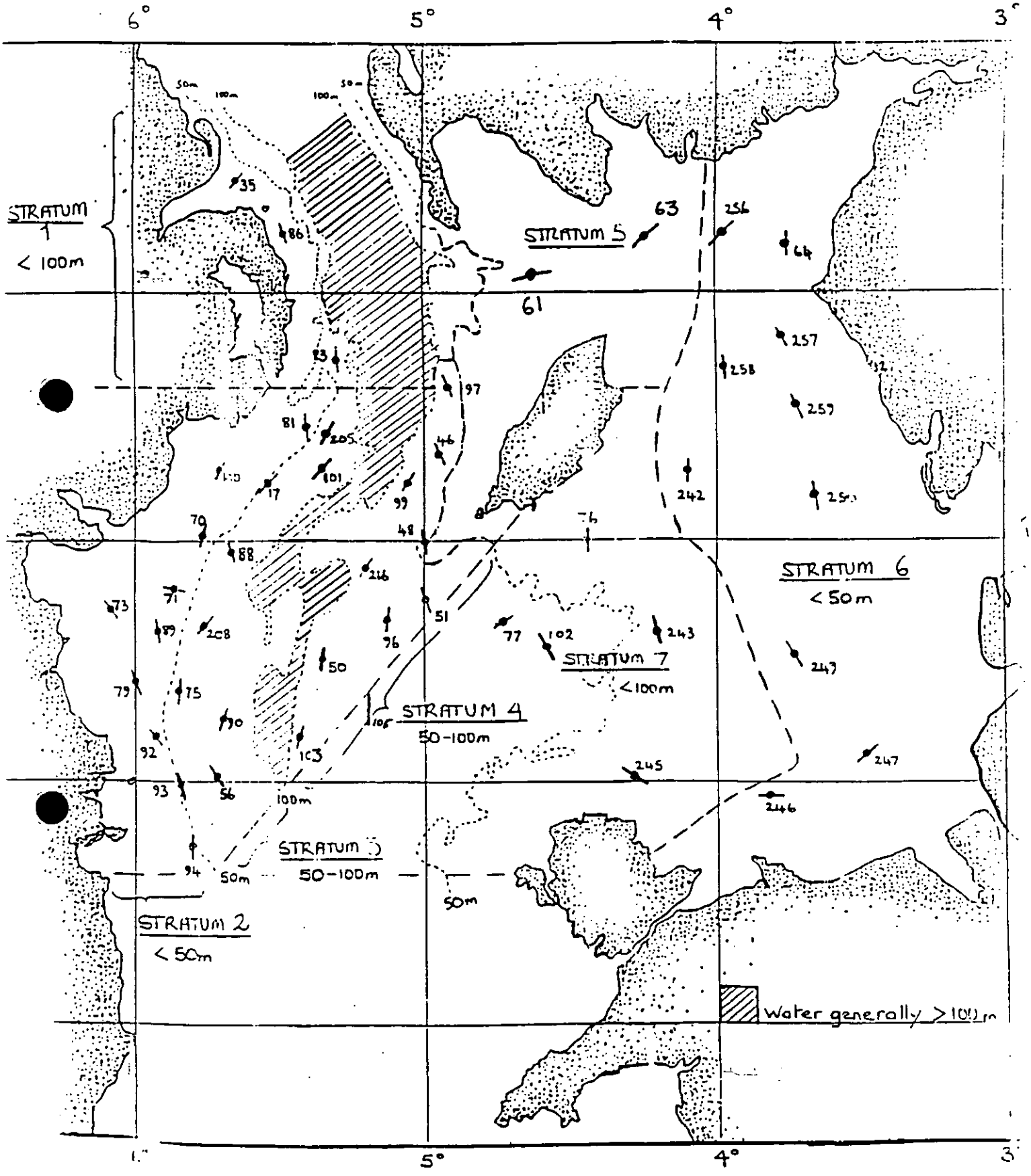
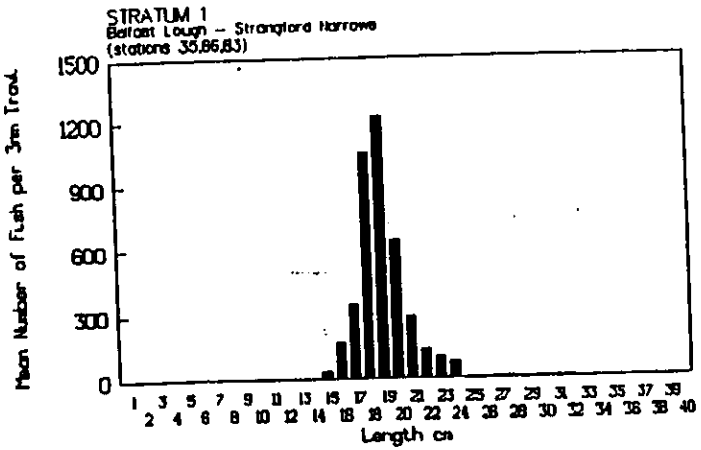
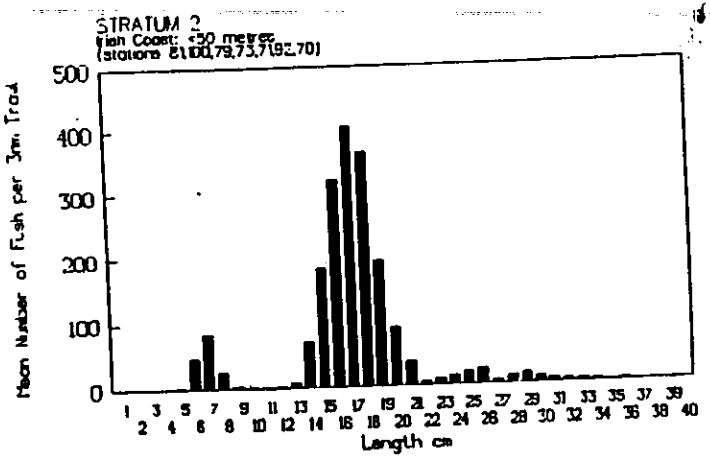
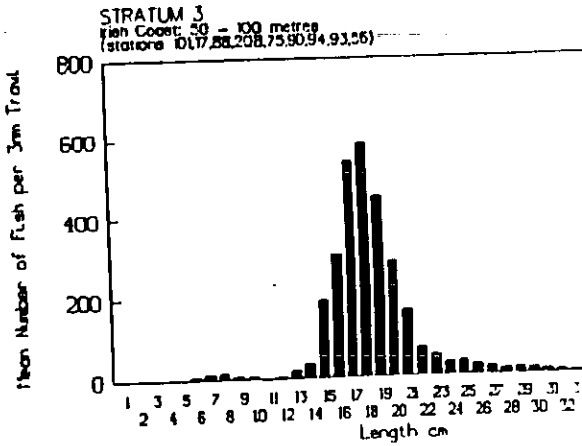


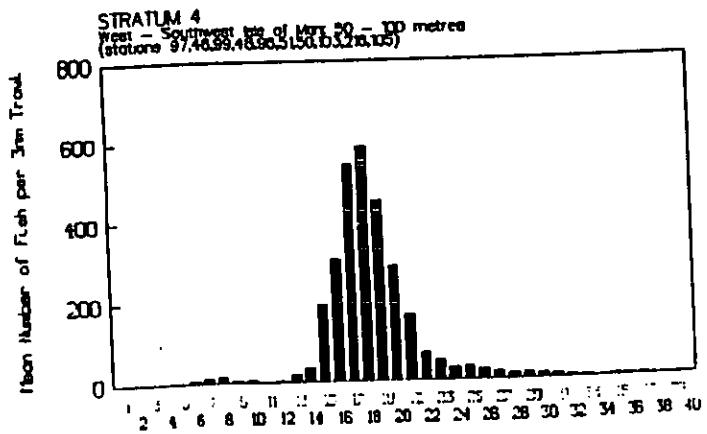
Figure 2

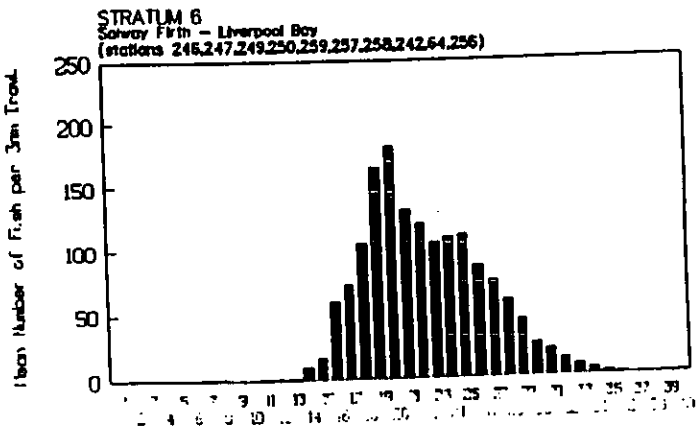
Average length frequency distribution of whiting by survey stratum in June/July 1994 (NB different y-axis scales on each graph)

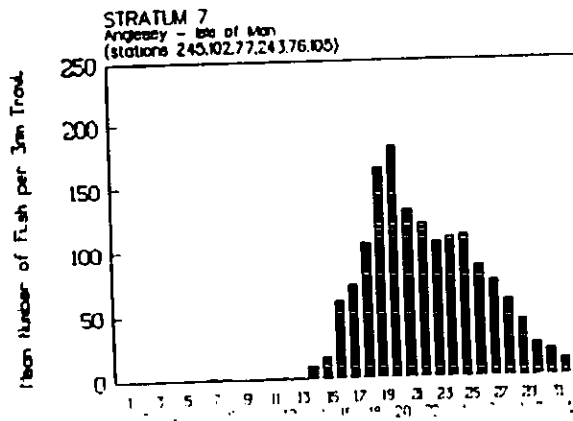












Details of trawl stations

Date	Trawl Stn.	Shooting time (GMT)	Shooting lat.	Shooting long.	Hauling lat.	Hauling long.	mean* depth m	dis tow nm	fish catch kg
27 Jun	35	07.10	54 43.1	5 42.0	54 44.0	5 36.9	18	3.0	1105
	86	09.31	54 37.7	5 26.8	54 34.6	5 25.4	40	3.1	89
	83	11.50	54 23.1	5 17.9	54 20.1	5 17.1	90	3.0	91
	81	14.15	54 15.0	5 24.6	54 12.7	5 24.2	47	2.3	180
	101	16.15	54 08.7	5 18.8	54 06.0	5 18.3	96	2.7	70
28 Jun	97	05.58	54 18.1	4 54.2	54 21.0	4 55.5	80	3.0	519
	46	08.26	54 11.9	4 57.6	54 09.2	4 55.4	76	3.0	145
	99	10.14	54 07.8	5 00.4	54 05.5	5 03.6	76	3.0	287
	48	12.19	54 00.8	4 59.4	53 58.2	4 58.8	58	2.6	131
29 Jun	73	05.55	53 48.6	6 05.6	53 51.6	6 05.8	26	3.0	83
	71	08.00	53 54.1	5 55.1	53 53.8	5 50.9	40	2.6	153
	70	09.50	53 59.8	5 46.1	54 02.5	5 43.8	42	3.0	1014
	100	11.02	54 08.2	5 40.9	54 09.7	5 40.5	29	1.5	845
	17	12.46	54 07.6	5 30.9	54 04.6	5 33.0	59	3.0	252
	88	15.46	53 59.6	5 38.5	53 56.6	5 40.6	68	3.2	161
30 Jun	103	05.57	53 34.1	5 24.6	53 36.3	5 22.6	81	2.5	87
	50	08.11	53 45.1	5 20.8	53 48.2	5 19.6	83	3.0	206
	216	10.17	53 54.8	5 13.3	53 57.5	5 11.1	67	3.0	77
	51	12.35	53 53.4	4 58.5	53 50.4	4 57.8	70	3.0	475
	96	14.50	53 52.4	5 06.3	53 49.4	5 06.4	65	3.0	191
	105	15.44	53 44.3	5 05.9	53 42.4	5 09.8	73	3.0	266
1 Jul	208	05.38	53 48.8	5 45.0	53 45.8	5 45.5	67	3.0	231
	79	08.07	53 43.2	5 59.0	53 40.3	5 57.9	33	3.0	95
	75	10.00	53 41.3	5 50.6	53 38.3	5 50.4	54	3.0	184
	92	11.55	53 36.7	5 56.2	53 34.1	5 53.9	38	3.0	468
	90	14.10	53 36.5	5 41.2	53 39.4	5 42.5	80	3.0	290
2 Jul		******** cruise break in Dublin********							
3 Jul	94	09.59	53 21.5	5 45.9	53 24.5	5 46.9	58	3.0	321
	93	12.10	53 28.6	5 48.4	53 31.2	5 50.2	61	3.0	291
	56	13.45	53 30.6	5 42.6	53 29.9	5 37.8	70	3.0	308
4 Jul	245	05.45	53 29.7	4 10.7	53 30.8	4 15.2	44	3.0	418
	102	91.32	53 43.8	4 38.8	53 46.2	4 40.9	62	3.0	278
	77	12.03	53 48.7	4 43.8	53 51.3	4 40.8	85	3.0	151
	76	14.36	53 59.3	4 29.0	54 00.3	4 24.2	44	3.0	134
5 Jul	242	05.54	54 07.0	4 04.5	54 04.7	4 01.1	36	3.0	216
	243	08.55	53 49.9	4 11.5	53 47.5	4 08.6	50	3.0	301
	246	12.27	53 28.8	3 48.6	53 29.1	3 46.5	33	1.3	353
	247	14.28	53 33.0	3 29.2	53 35.9	3 31.0	29	3.0	1059
6 Jul	249	05.59	53 46.5	3 40.5	53 48.9	3 43.7	33	3.0	422
	250	08.40	54 03.8	3 37.6	54 06.7	3 39.1	32	3.0	216
	259	10.41	54 15.0	3 41.1	54 17.7	3 42.6	37	3.0	96
	258	12.40	54 19.0	3 55.6	54 21.9	3 56.6	38	3.0	169
	257	14.60	54 24.5	3 43.9	54 26.9	3 46.8	31	3.0	248
7 Jul	64	05.30	54 35.4	3 43.6	54 38.3	3 45.3	16	3.0	330
	256	07.26	54 37.9	3 55.7	54 35.8	3 59.4	30	3.0	398
	63	09.36	54 37.6	4 11.8	54 35.7	4 16.2	58	3.0	228
	61	11.44	54 32.8	4 32.9	54 32.7	4 34.5	58	0.9	aborted

Catches of

ES	86	83	35	MEAN
	4.16	1.44	30.66	12.09
G	61.19	62.10	700.48	274.59
		.43		.43
	2.38		82.14	42.26
	5.09	9.28	.60	4.99
		8.24		8.24
G	1.15	1.86	101.60	34.87
			41.00	41.00
	.28	.41	43.00	14.56
	.66		11.92	6.29
			1.54	1.54
ARD				
S	9.82	.60	52.20	20.87
G				
AL		1.30	10.88	6.09
		1.59		1.59
PS		.11		.11
	4.55	4.06	29.00	12.54
	89.26	91.42	1105.02	428.57

M 2

IES	81	100	79	73	71	2	70	MEAN
	.23		.30	.06	.35	.1	4.81	.96
NG	134.25	59.00	33.47	31.68	32.04	255.42	355.58	128.90
	.57			.04	1.43	1.80	1.85	1.10
						.16		.16
CK		2.03	.57	2.41	4.56	122.17	62.00	32.32
		.25	.17	.01	.10	3.49	2.78	1.01
	.26		1.32		.39	4.12	1.53	2.25
T	3.68		7.72	19.08	19.38	16.40	221.83	60.23
NG	20.92	116.16	25.00	18.74	87.04		307.13	175.56
	.09	615.36	11.78	.81	.31	43.04	15.12	14.34
E	.25	28.51	2.74	3.39	2.06	5.15	17.38	7.06
	.20	18.27	1.85	.03	.15	.9	.48	.47
NARD	.36	.30				.17	7.17	3.58
GS	4.74	1.74						
OG								
ERAL						.2		.57
ER		.92				.1		2.92
ROPS	9.68		2.06	1.61	.73	.04	.10	.17
	.41	.31	.06	.10			16.35	7.57
	4.28	1.52	7.55	4.64	4.78	13.85		
	179.92	845.26	94.56	82.59	153.29	468.10	1014.09	405.43

UM 3

ECIES	101	17	208	75	90	56	93	88	94	MEAN
	.01	.50	.69	.56	6.14	12.68	4.11	4.66	5.78	3.89
ING	27.36	207.39	185.10	139.73	239.58	241.30	275.77	120.81	172.39	178.86
	3.36	.50						2.11		1.99
						.34				.34
						17.25	9.57	.01	2.68	5.99
OCK			.04	2.86	9.55	1.18	20.77	.75	.63	3.12
D	.10	.50	.57	.46			46.22	4.58	4.74	12.92
UT	7.39	1.99	16.97	11.60	9.87		20.67	14.42	1.29	7.21
ING	2.12	12.73	2.78	8.66	1.47	.74	.04	.12	.26	1.05
T		.63	3.52	2.44	1.35	.02	14.42	.18	56.94	9.99
CE		.86	.84	3.07	.58	3.06	4.89	.18	21.76	4.29
		.40		2.30	.02	.48	1.75	4.28	1.51	1.75
RNARD	.07	1.57	4.68	.70	.26	.02	10.72		36.25	23.48
OGS									.55	.55
DOG										.82
			.82						2.79	1.83
ERAL					1.49					14.28
ER		1.23			19.02	28.45	12.34	7.63		.04
ROPS	16.57	10.60	12.55	7.12		.03		.02	.05	6.57
D				.06		1.85	8.28	1.50	13.79	
ER	12.61	12.91	2.24	4.46	1.48					
AL	69.58	251.80	230.80	184.00	290.80	308.48	429.54	161.24	321.40	249.74

Catches of selected species (kg per 3nm tow)

TUM 4

ECIES	97	46	99	48	96	51	50	103	216	105	MEAN
	5.00	.07	1.16	1.96	1.11	3.31	4.09	3.28	.83	5.34	2.61
ING	454.37	90.11	195.69	16.19	108.08	160.70	128.66	70.22	22.92	170.34	141.73
		.60	.03	2.42		17.03	26.93		5.23		8.71
			.25								.25
OCK	.31	.00	.01	.77	1.55	29.99	.03	3.71	.03	.65	3.70
D	20.92	4.35	9.29	23.61	11.43	23.44	.27	.31	2.26	6.95	10.28
UT	2.40	9.33	29.75	18.82	21.02	67.56	13.83	2.78	11.78	34.03	21.13
RING	18.99	29.47	21.20	19.19	7.24	97.64	2.59	.54	8.06	5.38	21.03
AT		.01	.12		.26	.03	.01	.01	.12		.08
CE	.96	.19		.22	2.58	2.24		.42		7.47	2.01
			.04		.04	.13		.08		.04	.07
RNARD	.77	.34	.55	1.74	19.51	13.50	5.95		2.37	26.49	7.91
OGS	1.63		.97	31.02						1.18	8.70
DOG											
		.14	.92	.16	.82	.37	.61			.33	.48
ERAL		.23	1.69	.93	2.62	9.00			.42	5.94	2.98
ER			1.37			6.35		4.31			4.01
ROPS	8.67	7.72	18.29	.15	2.92	2.68	19.99	.13	15.17	.35	7.60
D			.09		.29		.03	1.57	.26	.91	.53
R	5.33	2.51	5.59	14.29	11.25	41.05	2.82		7.41	.91	10.13
L	519.35	145.06	286.99	131.46	190.70	475.00	205.80	87.34	76.86	266.28	238.48

ATUM 6

PEC	242	246	247	249	250	259	257	64	258	256	MEAN
	3.28	21.19	14.35	.53	1.40	.01	.00	3.44	3.88	1.04	4.91
TING	27.07	76.00	414.81	214.39	107.47	45.56	136.28	181.42	78.19	126.84	140.80
E											
	.14		1.13		1.77	.09	.73	.26	1.91	.28	.79
DOCK	.00	.30		1.72	.34						.59
OD	4.77		64.99	12.26		5.86	7.47	2.02	16.98	5.49	14.98
OUT							.03		.16		.10
RING	1.51	121.65	109.14	1.45	6.95	8.00	45.68	3.23	2.20	6.21	30.60
AT			.50		1.59	1.52	14.52	51.58	.31	118.16	26.88
ICE	4.65	15.20	58.63	24.99	15.20	1.03	11.69	45.00	3.32	20.57	20.03
	10.33	2.30	30.91	20.65	25.00	1.39	14.38	22.30	6.61	12.36	14.62
URNARD	4.26	.41		.32	.20	.33	.11	.38	.21	.27	.72
DOGS.	113.82	75.21	197.98	50.40			.99	1.70	5.66	78.60	65.54
RDOG		12.44		10.01						4.76	9.07
D	.47		4.00	.23		.24	.10			1.06	1.02
FERAL	1.41	3.52	17.25	2.13	.47	.24	1.21	2.57		1.34	3.35
LER		.67	.90		3.44	.22			.33		1.11
HROPS					20.26	24.88	6.15		45.00		24.07
ID	1.04	.01	1.44	.08		.05		.14		.22	.43
ER	43.67	24.11	142.47	82.87	32.06	7.12	8.96	16.17	4.37	21.11	38.29
AL	216.40	353.00	1058.50	422.03	216.15	96.52	248.27	330.20	169.10	398.30	350.85

ATUM 7

PECIES	76	243	245	102	77	MEAN
	1.10	8.21	14.09	10.07	9.34	8.56
TING	.85	15.49	187.83	86.60	22.38	62.63
KE	5.23	3.33		6.99		5.18
B		26.97	.47		2.47	9.97
DDOCK		.00	3.51	1.01	2.25	1.69
COD	1.98	13.52	13.02	19.03	21.02	13.71
POUT				1.09	1.14	1.11
RRING	.37	35.13	33.21	24.97	24.46	23.63
AT						
ICE			.99	3.71	1.83	2.18
		.16	4.80	.63	.14	1.43
GURNARD	.25	3.00	1.02	1.29	4.85	2.08
DOGS	87.09	74.40	106.88	66.75	35.79	74.18
URDOG	3.56	6.34			1.74	3.88
AD	.16			1.61	1.20	.99
CKERAL	2.44	1.03	.30	8.29	5.26	3.46
GLER	1.61		7.35		.83	3.26
PHROPS						
UID	.13	2.21		1.26	.15	.94
HER	29.24	111.08	44.54	44.41	15.69	48.99
TAL	133.98	300.87	418.00	277.70	150.52	256.21

STRATUM 5

SPECIES	63
COD	13.66
WHITING	42.90
HAKE	
BIB	6.87
HADDOCK	9.31
P.COD	2.82
N.POUT	
HERRING	9.95
SPRAT	.50
PLAICE	19.47
DAB	4.36
G.GURNARD	1.45
LS DOGS	87.59
SPURDOG	4.27
SCAD	.87
MACKERAL	2.22
ANGLER	
NEPHROPS	
SQUID	
OTHER	21.68
TOTAL	227.90

Table 3

Total whiting catch (numbers per 3nm tow) and number of whiting < 12 cm and ≥ 27 cm.

STRATUM 1 Belfast Lough - Strangford Narrows

STN	35	86	83	MEAN
TOTAL	10424	784	985	4064
<12cm	0	3	2	2
<27cm	10424	763	971	4053
>27cm	0	21	14	12

STRATUM 2 Irish Coast: < 50 metres

STN	81	100	79	73	71	92	70	MEAN
TOTAL	3651	1047	855	918	1738	4522	1047	1968
<12cm	4	30	119	83	869	25	30	166
<27cm	3645	887	853	918	1738	4457	887	1912
>27cm	7	160	2	0	0	65	160	56

STRATUM 3 Irish Coast: 50:100 metres

STN	101	17	88	208	75	90	94	93	56	MEAN
TOTAL	545	5134	2400	3594	2441	2309	2547	3951	3095	2891
<12cm	1	8	7	12	5	0	0	380	22	48
<27cm	534	5124	2390	3587	2417	1975	2530	3837	2907	2811
>27cm	11	10	9	7	24	334	17	114	188	79

STRATUM 4 West - Southwest Isle of Man : 50 - 100 metres

STN	97	46	99	48	51	96	105	103	50	216	MEAN
TOTAL	6672	1593	3267	284	1523	1448	1548	562	733	349	1798
<12cm	6	19	37	8	14	107	0	0	20	30	24
<27cm	6043	1527	3141	273	1179	1271	1148	360	270	313	1553
>27cm	629	66	126	11	344	177	399	202	463	36	245

STRATUM 5 North of Isle of Man

STN	63
TOTAL	332
<12cm	9
<27cm	195
>27cm	137

STRATUM 6 Solway Firth - Liverpool Bay

STN	259	258	257	256	64	242	246	247	249	250	MEAN
TOTAL	472	851	1614	1440	1596	235	1666	3755	2868	835	1533
<12cm	2	1	0	0	4	0	0	4	13	0	2
<27cm	392	705	1455	1284	1145	185	1403	2876	2804	555	1280
>27cm	80	146	159	155	452	50	263	879	64	280	253

STRATUM 7 Anglesey - Isle of Man

STN	102	77	76	245	243	MEAN
TOTAL	877	189	9	1539	113	545
<12cm	0	3	1	26	0	6
<27cm	761	146	7	1170	73	431
>27cm	116	43	2	369	40	114