DEPARTMENT OF AGRICULTURE FOR NORTHERN IRELAND

Agricultural and Environmental Sciences Division

CRUISE REPORT LF2199

JUVENILE GADOID STUDY 23 to 29 May 1999

1. Prof Peace
2. Prof McMurray

This is the report of another of the regular time series survey of juvenile gadoids. The information collected gives early indication of recruitment of different species into the fishery & hence of high interest to [illegible] & the industry. The high spatial resolution obtained also is providing insights to factors controlling trends & interannual variability of species recruitment. [illegible] 11/6.

PERSONNEL

M Dickey-Collas	SSO [SIC]	DANI
M. McAliskey	SO	DANI
W McCurdy	SSO	DANI
J. Peel	ASO	DANI
C Burns	SO	DANI
O Lee	post grad	UCD

OBJECTIVES

1. To investigate the abundance and geographic distribution of juvenile gadoids in the western Irish Sea, as part of the juvenile gadoids index (1994 to 1999).
2. To collect otoliths for new recruitment project to investigate whiting growth and hatch day distributions.
3. To collect samples for biochemical investigations of larval and juvenile fish condition.
4. To investigate the degree of MIK sample spatial variability of complementing previous studies.
5. To carry out trials with the new rectangular midwater trawl (RMT) net.
6. To collect zooplankton samples from the DANI moorings in the western Irish Sea.

METHODS

This cruise is the first of two cruises investigating the abundance of this year's gadoid production in the western Irish Sea. Two grids of stations were worked, one with the high speed plankton sampler (Gulf VII for larvae) and one with the MIK net (for juveniles; see Table I). A new sampling grid was used to account for the very high spatial variability that is usually found in gadoid distribution. The grid was based on stratified optimal sampling analysis of 1994 to 1999 data. Plankton samples were sorted onboard and preserved in buffered 4% formaldehyde. Fish larvae and juveniles were picked from the samples and fixed in 99% ethanol. Some fish (dabs, sprat and sand eels) were measured and

frozen for biochemical analysis. Other macrozooplankton were counted and weighed. 6 ring net samples were collected for Dr R Gowen's project.

The site between MIK stations 34, 35, 40 and 41 were resampled during the day for further analysis. This site was also used for the RMT trials.

CRUISE NARRATIVE

Sunday 23 May 1999

Scientific staff boarded the vessel and attended a pre-cruise briefing which included a safety demonstration and discussion. New scientists were shown the DANI *Lough Foyle* safety video. The RV *Lough Foyle* sailed at 21:30hr and proceeded south to station 29.1 (Figure 1).

Monday 24 May 1999

Four MIK net samples were taken and the net of the MIK frame then broke. This was as a result of high densities of jelly fish. Gulf stations were sampled till 16:45. After this, no further stations were worked as the winch cable failed to conduct the electronic signal from the sampler. A new net was put on the MIK frame and sampling continued until the following morning. Ring net zooplankton samples were collected.

Tuesday 25 May 1999

After a night of MIK sampling, the *Lough Foyle* returned to Belfast and docked at 11:00. The Lebus winch cable and Gulf sampler were examined. The cable was found to be damaged and 100m were removed from the winch and the termination was re-attached and tested. The ship headed back to sea at 19:00 and sampling began at 23:20.

Wednesday 26 May 1999

Further stations were sampled with the Gulf or MIK net. Another MIK net ripped as a result of high densities of jelly fish. This was replaced and the sampling continued.

Thursday 27 May 1999

Extra day-stations were sampled between 12:00 and 18:00. The sampling grids were completed by midnight.

Friday 28 May 1999

RMT trials were carried out all day, with limited success. The net appeared to operate well but the sensors proved problematic. In the evening, the vessel headed for Belfast and docked late that night.

Saturday 29 May 1999

The scientists and their gear disembarked in the morning

RESULTS

30 Gulf, 44 MIK, 4 RMT and 6 ring nets deployments were made during the cruise. All stations were sampled. Over 170 million litres of water were sampled and over 2,200 fish were caught. 566 whiting were preserved for primary incremental analysis and over 250 larvae were frozen for biochemical analysis at UCD. This was the first juvenile gadoid survey for three years that caught sizable numbers of cod.

The western Irish Sea was stratified (Figure 2), with the highest fluorescence in the centre of the stratified region. Whiting were dispersed across the region whilst cod tended to be more coastal (Figure 3). The distributions of the other target species conformed to previous surveys (Figure 4), but numbers of Pasiphaea and sand eels were higher than in other years. The level of spatial variance has yet to be assessed but it is hoped that the new survey design will improve the estimates of abundance.

ACKNOWLEDGMENTS

The Master, officers and crew of *MRV Lough Foyle* are thanked for their enthusiastic co-operation throughout this very successful cruise. Both the crew and scientists proved very resourceful when faced with the failure of equipment. The scientific staff are to be congratulated for their example of effective team work in completing all objectives effectively and efficiently. Despite the long hours and trying environment, the scientists must be commended for working in a very professional, constructive and calm manner. The SIC really enjoyed taking part in this cruise.

29/5/99.

M Dickey-Collas
(Scientist in Charge)

A Niblock
(Master)
29/5/99.

SI Heaney
(Aquatics Systems)

Table 1. station details from LF2199

MIK details				Start				Finish				Total nm
date	time	station	haul	lat	mins	long	mins	lat	mins	long	mins	Distance
24/05/99	02:35	29.1	1	54	11.24	5	19.86	54	11.02	5	20.15	0.28
	03:17	29.2	2	54	7.66	5	24.79	54	7.36	5	24.98	0.32
	03:56	29.3	3	54	4.37	5	19.56	54	4.03	5	20.06	0.45
	05:20	28	4	54	7.19	5	37.16	54	6.98	5	37.42	0.26
	19:39	34.3	16	53	48.75	5	34.35	53	49.12	5	35.35	0.70
	20:27	34.2	17	53	52.46	5	39.7	53	52.51	5	40.93	0.73
	21:23	34.1	18	53	55.94	5	34.5	53	56.05	5	35.81	0.78
	22:27	35.2	19	53	52.52	5	24.19	53	52.32	5	24.83	0.43
	23:08	35.3	20	53	48.98	5	19.29	53	48.94	5	19.97	0.40
25/05/99	00:08	35.1	21	53	55.96	5	19.52	53	55.94	5	20.07	0.32
	01:10	36	22	53	52.5	5	6.99	53	52.47	5	7.37	0.23
	02:16	37	23	53	52.51	4	52.15	53	52.44	4	52.65	0.30
	03:57	31	24	54	6.95	4	52.18	54	6.95	4	52.36	0.11
	04:50	30.3	25	54	3.99	5	4.45	54	4.01	5	5.2	0.44
	05:31	30.2	26	54	7.48	5	9.21	54	7.48	5	10.17	0.56
	06:18	30.1	27	54	10.97	5	4.24	54	10.95	5	5.08	0.49
	23:20	33.1	28	53	56.35	5	52.4	53	55.97	5	52.41	0.38
26/05/99	00:30	32	29	53	52.63	6	5.9	53	52.5	6	6	0.14
	01:30	33.2	30	53	49.25	5	52.22	53	48.96	5	52.4	0.31
	02:24	39.2	31	53	41.2	5	52.23	53	41	5	52.43	0.23
	03:18	38	32	53	37.61	6	3.7	53	37.48	6	3.02	0.42
	04:11	39.1	33	53	34.28	5	52.42	53	34.06	5	52.41	0.22
	05:25	43	34	53	24.6	6	2	53	24.22	6	2.09	0.38
	20:45	42	50	53	37.84	5	7.38	53	38.14	5	7.44	0.30
	21:43	41.1	51	53	41.33	5	19.87	53	40.76	5	20.15	0.59
	22:34	41.3	52	53	34.35	5	20	53	33.9	5	19.97	0.45
	23:15	41.2	53	53	37.11	5	25.09	53	37.81	5	25.58	0.76
27/05/99	00:16	40.1	54	53	41.44	5	34.53	53	41.11	5	34.75	0.35
	00:52	40.2	55	53	37.66	5	39.66	53	37.25	5	39.96	0.45
	01:33	40.3	56	53	34.39	5	34.53	53	33.72	5	34.66	0.67
	02:27	45.1	57	53	26.23	5	37.59	53	25.98	5	37.61	0.25
	03:26	44.1	58	53	26.11	5	52.49	53	25.78	5	52.49	0.33
	04:11	44.2	59	53	19.16	5	52.38	53	18.88	5	52.46	0.28
	05:16	45.2	60	53	19.11	5	37.48	53	18.8	5	37.56	0.31
	12:02	41	65	53	37.27	5	22.11	53	37.62	5	22	0.36
	13:10	40	66	53	37.22	5	37.61	53	37.61	5	37.21	0.46
	15:19	88	67	53	45.153	5	30.07	53	44.55	5	30.55	0.67
	15:37	88	68	53	44.58	5	30.67	53	44.94	5	30.37	0.40
	16:44	35	69	53	52.34	5	22.61	53	52.69	5	22.4	0.37
	17:49	34	70	53	52.19	5	37.88	53	52.48	5	37.25	0.47
	18:55	33.3	71	53	52.24	5	47.81	53	52.79	5	47.65	0.56
	20:40	39.3	72	53	37.68	5	47.64	53	37.18	5	48.09	0.57
	23:05	46	73	53	22.32	5	23.68	53	22.46	5	22.45	0.75
28/05/99	00:18	47	74	53	22.22	5	7.91	53	22.5	5	7.29	0.46
CULF VII details												
24/05/99	06:09	2	5	54	4.05	5	37.25	54	3.87	5	37.91	0.43
	07:12	1	6	54	4.17	5	52.3	54	3.94	5	52.55	0.27
	08:03	7	7	53	56.23	5	52.38	53	55.91	5	52.65	0.36
	09:21	8	8	53	55.71	5	37.92	53	56.34	5	36.95	0.85
	10:27	14	9	53	49.19	5	37.19	53	48.63	5	37.88	0.69
	11:42	13	10	53	49.14	5	51.99	53	48.8	5	52.53	0.47
	12:55	6	11	53	55.98	6	4.76	53	55.97	6	4.99	0.14
	13:44	12	12	53	49	6	7.29	53	48.95	6	7.72	0.26
	15:01	18	13	53	40.95	6	3.92	53	40.95	6	4.15	0.14
	15:49	19	14	53	41.07	5	52.58	53	41	5	51.95	0.38
	16:45	20	15	53	40.99	5	38.24	53	41.01	5	37.55	0.41
26/05/99	06:43	23	35	53	34.03	6	1.5	53	33.88	6	1.51	0.15
	07:29	24	36	53	33.82	5	52.5	53	34.39	5	52.54	0.57
	08:33	25	37	53	34.32	5	37.52	53	33.86	5	37.49	0.46
	09:38	26	38	53	33.59	5	22.53	53	34.43	5	22.49	0.84
	10:26	21	39	53	40.62	5	22.51	53	41.13	5	22.54	0.51
	11:16	15	40	53	48.53	5	22.51	53	49.32	5	22.58	0.79
	12:05	9	41	53	55.59	5	22.47	53	56.2	5	22.48	0.61
	13:02	3	42	54	3.6	5	22.78	54	4.26	5	22.49	0.68
	14:08	4	43	54	3.71	5	7.79	54	4.19	5	7.37	0.54
	15:13	5	44	54	4.3	4	52.28	54	3.96	4	52.43	0.35
	16:20	11	45	53	56.36	4	52.35	53	56.02	4	52.45	0.35
	17:24	10	46	53	56.19	5	7.4	53	55.82	5	7.61	0.39
	18:14	16	47	53	49.16	5	7.45	53	48.88	5	7.51	0.28
	19:12	22	48	53	41.21	5	7.38	53	40.78	5	7.64	0.46
	20:10	27	49	53	34.38	5	7.44	53	34.01	5	7.4	0.37
27/05/99	06:44	24.1	61	53	26.9	5	52.61	53	27.43	5	52.5	0.53
	08:06	25.1	62	53	27.4	5	37.52	53	26.81	5	37.4	0.59
	09:15	26.1	63	53	27.27	5	22.64	53	26.76	5	22.25	0.56
	10:15	27.1	64	53	27.02	5	8.31	53	27.02	5	6.98	0.79

RMT trials carried out at 53°51', 5°30' on the 28 May 1999.

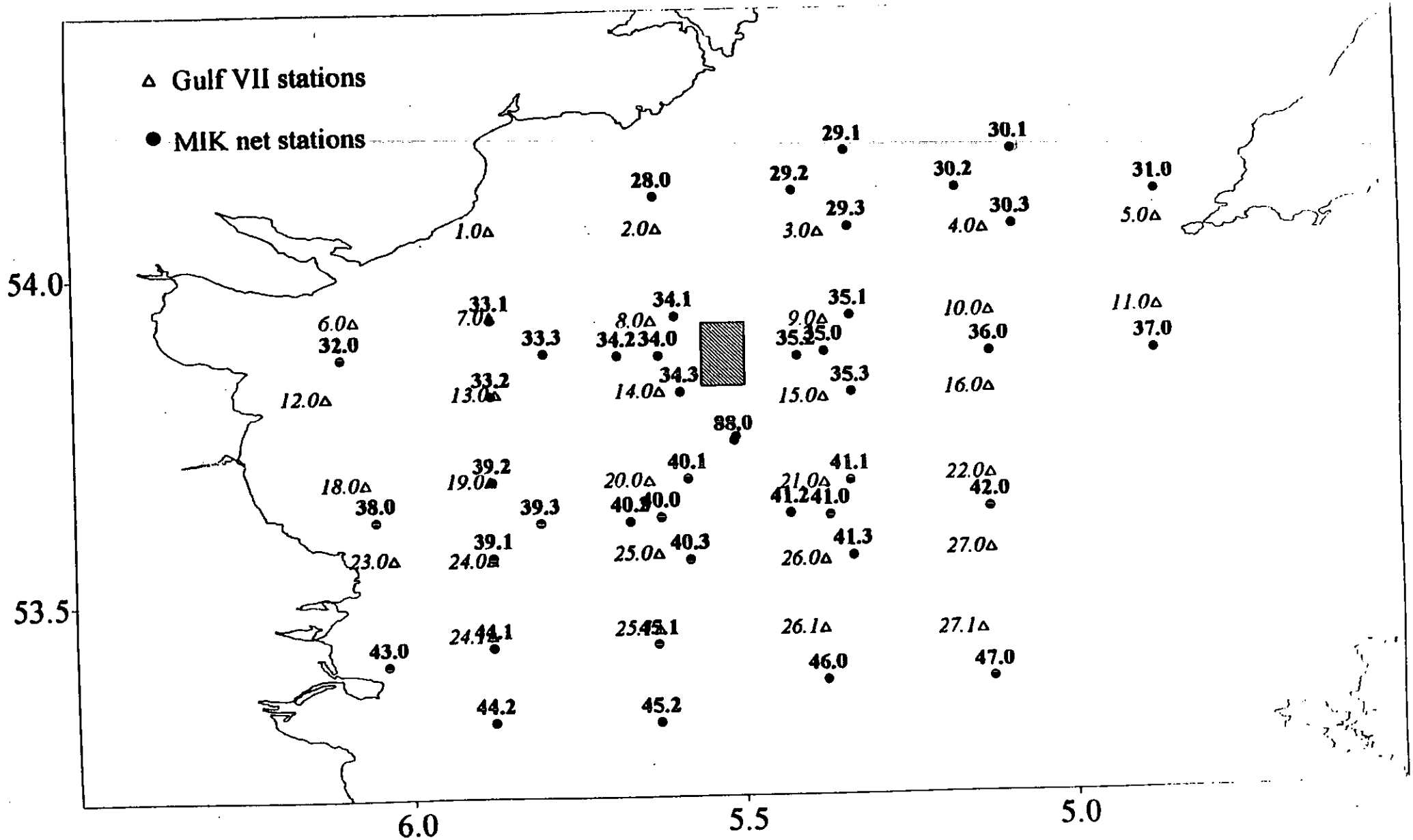
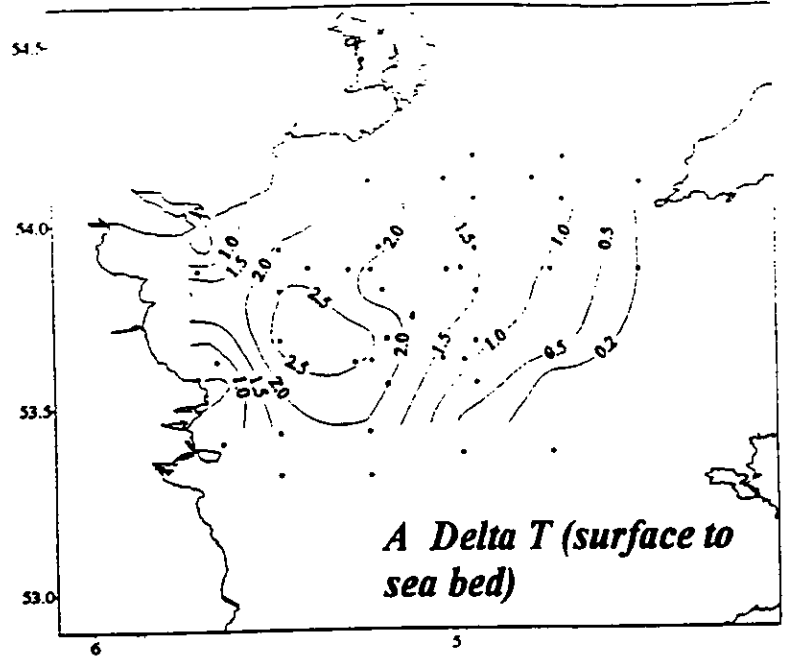
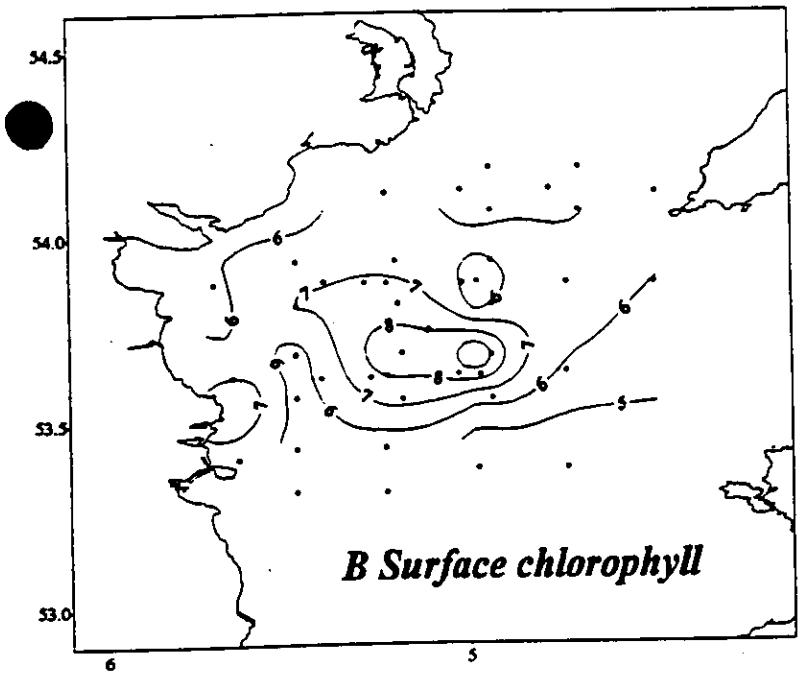


Figure 1 Stations sampled during LF2199
Rectangle denotes site of RMT trials





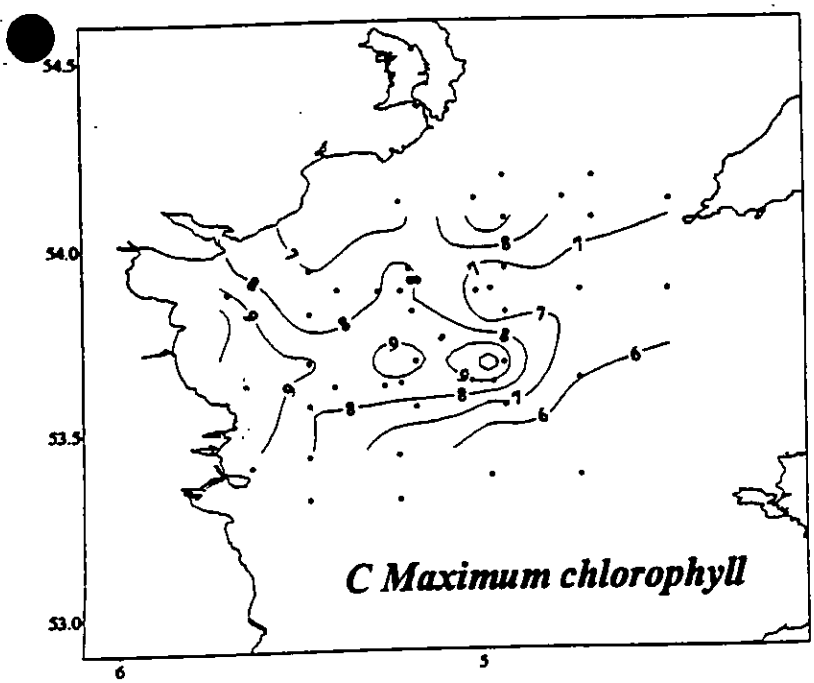


Figure 2 Oceanography of region on LF2199

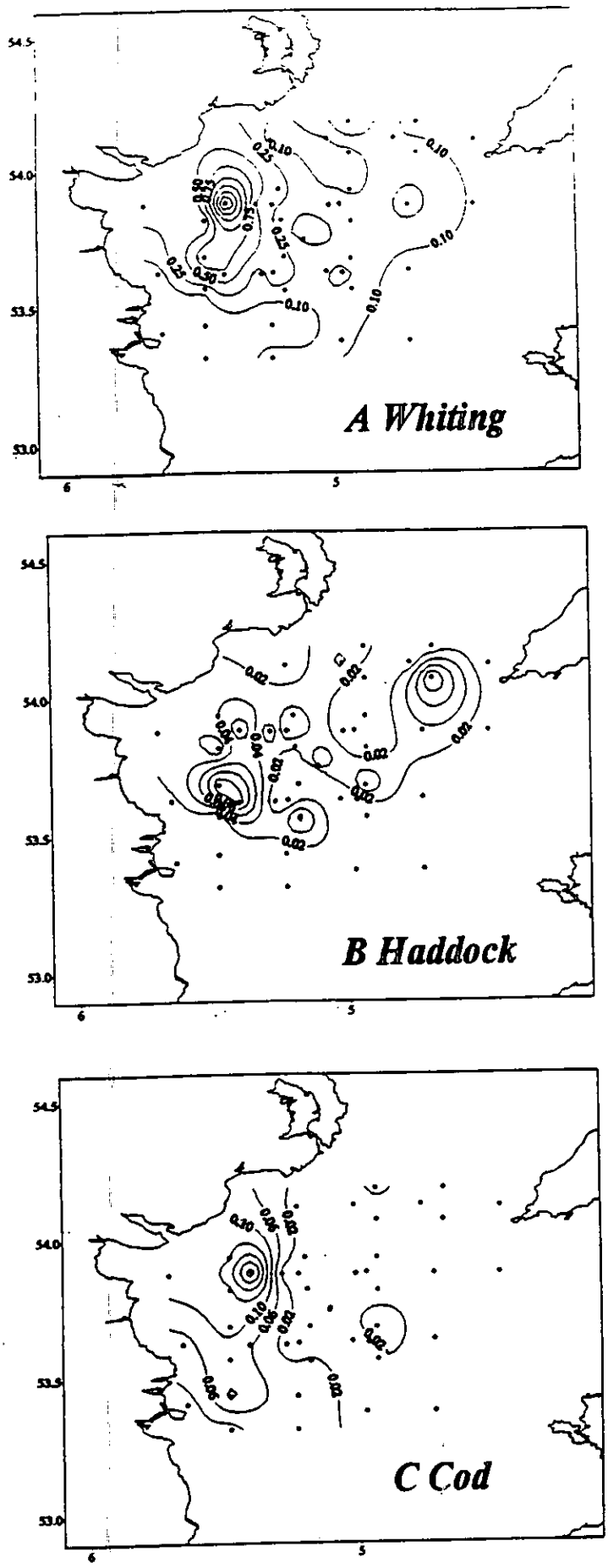


Figure 3 Distribution of Juvenile Gadoids caught during LF2199 with MIK net

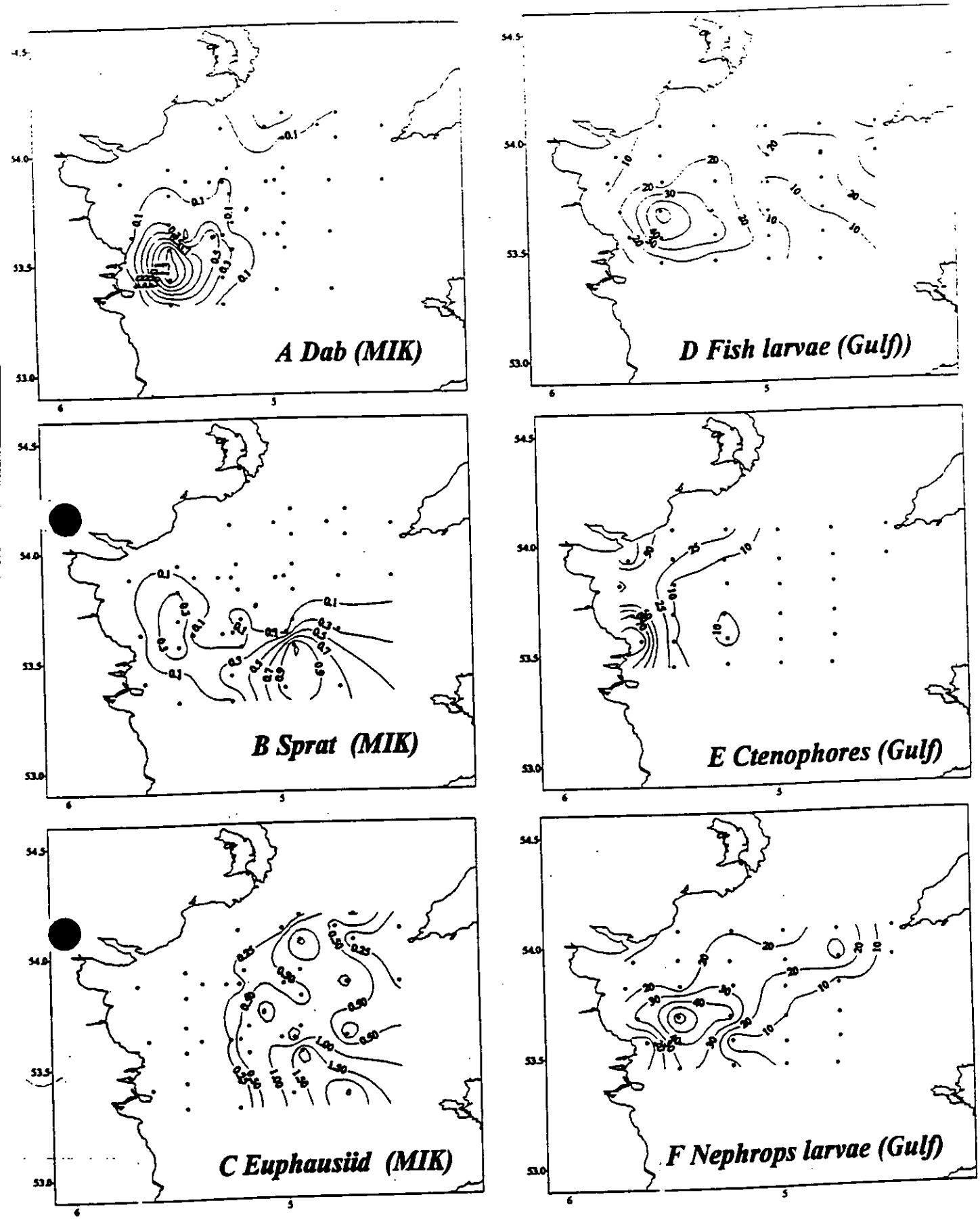


Figure 4 Distribution of other target species during LF2199, both MIK and Gulf VII catches.