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Assessment of the Northern Shrimp Stock on Flemish Cap (Division 3M)

by

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Introduction

Around May 1993 a commercial shrimp fishery started on Flemish Cap (Div 3M). Until mid Aug 1994 Faroese vessel have caught about 13500 t (Tab. 1) in this area and the catches per week are still comparativly high and though heavily fished the stock seems to sustain itself so far (Tab. 2 and Fig. 1).

In the following an assesment is made using data from logbooks. The procedure is the same as in a similar assessment made of the same stock in 1993 (Á.Nicolajsen, 1993).

Material and method

The assessment is done by the area swept method with data from 7 logbooks from Faroese vessels in the period May 1993 - Mar 1994 containing information on date, position of haul, duration of haul and shrimp catches. Total number of hauls were 2618 with 2483 on Div 3M and 135 on 3L. The hauls were group into squares of 7.5 degrees latitude times 10 degrees longitude. The geographical distribution of the hauls is shown in Fig. 2. All the hauls for the period (which covers almost a year) are included in the assessment.

The density is calculated as catch divided by area swept. The area is calculated as average towing speed (2.75 nm/h) times the duration of the trawl on the bottom times assumed effective width of the trawl (42 m).

Catches per week in Tab 2 and Fig 1 are as reported by the fishing vessels to the Faroese Fisheries Authorities.

Results

The density in each square is presented in Fig. 3. The average density is 1.99 g/m^2 (Tab 3) compared to 2.22 g/m^2 in last years assessment. On the other hand the extention of the fishing area has increased. Excluding squares with less than 5 hauls, the higest densities seem to be on the northern and northwesterly sloop of the Cap. Biomass in each square is shown in Fig. 4 and the total stock biomass (again excluding squares with less than 5 hauls) is estimated at 23170 t (Tab 3).

References

Nicolajsen, Á. 1993. Assessment of the shrimp stock on Flemish Cap (Div 3M) for 1993.

Table 1 Catches (t) of shrimp by Faroese vessel in Div 3M and 3L from May 1993 until mid Aug 1994.

Year	Div 3L	Div 3M
1993	0	8545
1994	355	4899

Table 2 CPUE of Faroese shrimp vessels and number of vessels in Div 3M and 3L from May 1993 - Aug 1994.

Year	Week No	Div 3L Catch per vessel per week tonnes	Div 3L No of vessels	Div 3M Catch per vessel per week tonnes	Div 3M No of vessels
1993	21			92	3
	22			104	7
	23			75	7
	24			59	8
	25			46	9
	26			42	8
	27			52	7
	28			38	8
	29			39	7
	30			39	8
	31			46	8
	32			40	9
	33			41	8
	34			35	8
	35			29	8
	36			46	7
	37			30	7
	38			44	6
	39			34	6
	40			35	6
	41			35	5
	42			28	5
	43			32	4
	44			28	4
	45			30	4
	46			29	3
	47			21	4
	48			34	5
	49			32	5
	50			59	5
	51			46	5
	52			17	4

Year	Week No	Div 3L Catch per vessel per week tonnes	Div 3L No of vessels	Div 3M Catch per vessel per week tonnes	Div 3M No of vessels
1994	1			20	2
	2			35	1
	3			55	1
	4			29	1
	5			29	1
	6			70	1
	7			32	3
	8			37	6
	9	38	2	30	5
	10	35	2	22	5
	11	25	1	29	6
	12	44	2	22	4
	13	12	1	13	4
	14	16	1	10	1
	19	29			
	20			26	5
	21			38	7
	22			35	8
	23			45	8
	24			42	8
	25			43	8
	26			37	8
	27			25	8
	28			36	9
	29			24	9
	30			32	10
	31			24	8
	32			34	8
	33			25	7

Table 3 Calculated values of density and biomass grouped by square in Div 3M.

Midpoint of square Longitude	Latitude	No of hauls	Density g/m2	Area Km2	Biomass tonnes
-46.25	46.41	2	1.22		
-46.25	46.49	2	1.15		
-46.15	47.04	59	1.75	175	305
-46.15	47.11	24	1.23	175	215
-46.15	46.49	20	1.64	176	288
-46.15	46.56	80	1.76	176	309
-46.15	46.34	3	1.72		
-46.15	47.19	1	5.47		
-46.15	47.34	1	0.72		
-46.15	47.56	2	2.28		
-46.15	47.41	1	5.39		
-46.15	46.41	3	1.21		
-46.05	47.26	3	1.47		
-46.05	47.11	76	1.58	175	277
-46.05	47.04	57	1.83	175	321
-46.05	47.19	4	1.50		
-46.05	46.49	95	2.00	176	353
-46.05	46.41	36	1.27	176	223
-46.05	46.34	1	0.89		
-46.05	46.56	13	1.36	176	239
-45.55	47.26	21	2.06	174	358
-45.55	47.11	33	1.98	175	346
-45.55	47.19	68	1.86	174	323
-45.55	46.41	92	1.98	176	348
-45.55	46.34	43	1.90	177	336
-45.55	47.04	13	1.80	175	314
-45.55	46.49	28	1.53	176	269
-45.55	47.34	4	1.05		
-45.55	46.19	5	2.71	178	483
-45.45	47.49	5	1.36	173	235
-45.45	47.34	48	2.06	174	358
-45.45	47.19	3	2.22		
-45.45	46.19	1	1.79		
-45.45	47.41	8	2.34	173	404
-45.45	46.49	2	1.75		
-45.45	46.34	34	1.97	177	349
-45.45	47.26	21	1.77	174	308
-45.45	46.41	76	2.00	176	352
-45.35	48.04	5	1.68	172	290
-45.35	47.49	18	2.97	173	514
-45.35	47.41	36	2.90	173	502
-45.35	47.56	2	1.53		
-45.35	47.34	18	2.23	174	388
-45.35	47.26	1	2.76		
-45.35	46.41	5	1.99	176	351
-45.35	46.34	5	1.15	177	203
-45.25	46.34	3	3.44		
-45.25	47.41	1	2.52		
-45.25	47.56	22	2.78	172	477
-45.25	46.41	1	2.01		
-45.25	47.49	24	2.48	173	429
-45.25	46.26	2	1.00		
-45.25	48.04	18	1.56	172	269
-45.25	48.11	7	1.77	171	302
-45.25	47.19	1	4.21		
-45.15	46.56	6	2.51	176	442
-45.15	48.11	16	1.52	171	260
-45.15	46.41	1	2.16		
-45.15	47.56	25	2.72	172	468
-45.15	46.34	1	1.86		
-45.15	48.04	94	2.54	172	436
-45.15	47.34	1	5.15		
-45.05	48.04	112	2.87	172	494
-45.05	47.04	1	1.69		
-45.05	46.26	1	0.15		
-45.05	47.34	3	2.09		
-45.05	47.56	4	1.75		
-45.05	48.11	48	2.45	171	418
-45.05	48.19	6	1.80	171	307
-45.05	47.41	1	0.00		
-44.55	48.11	74	3.45	171	589
-44.55	47.56	1	2.11		
-44.55	47.34	1	4.17		
-44.55	48.19	1	3.15		
-44.55	46.34	1	1.70		
-44.55	48.04	117	2.53	172	435
-44.55	46.41	2	1.66		
-44.45	47.34	1	0.54		
-44.45	48.04	61	2.23	172	383
-44.45	48.11	59	1.83	171	312
-44.45	48.19	1	1.37		
-44.45	47.56	3	1.12		
-44.35	48.11	16	2.28	171	389
-44.35	47.56	13	2.46	172	423
-44.35	48.04	77	1.99	172	341
-44.35	47.49	1	0.75		
-44.25	47.49	2	1.15		
-44.25	47.56	82	2.72	172	467
-44.25	47.41	1	0.38		
-44.25	48.11	2	1.90		
-44.25	47.34	2	2.67		
-44.25	48.04	17	1.69	172	290
-44.25	47.26	1	1.69		
-44.15	47.41	6	1.96	173	339
-44.15	47.49	31	1.82	173	314
-44.15	47.56	31	1.61	172	276
-44.15	47.04	1	1.27		
-44.05	46.41	5	1.69	176	298
-44.05	47.34	19	1.59	174	277
-44.05	47.41	60	1.91	173	330
-44.05	47.49	19	1.97	173	341
-44.05	47.56	1	2.17		
-44.05	48.04	1	1.98		
-43.55	47.26	24	1.52	174	265
-43.55	48.04	2	2.38		
-43.55	47.41	4	1.21		
-43.55	48.19	1	1.09		
-43.55	47.11	11	1.38	175	241
-43.55	46.34	1	1.87		
-43.55	47.34	37	1.72	174	299
-43.55	47.19	75	1.70	174	296
-43.55	46.56	32	1.60	176	281
-43.55	47.04	22	1.47	175	258
-43.55	46.49	10	2.18	176	383
-43.45	47.19	20	1.78	174	309
-43.45	47.11	29	1.62	175	284
-43.45	47.04	19	1.74	175	305
-43.45	47.26	3	0.75		
-43.45	46.56	5	3.28	176	578
-43.35	47.49	1	0.00		
			average density g/m2	Total area km2	Total biomass tonnes
			1.99	11653	23170

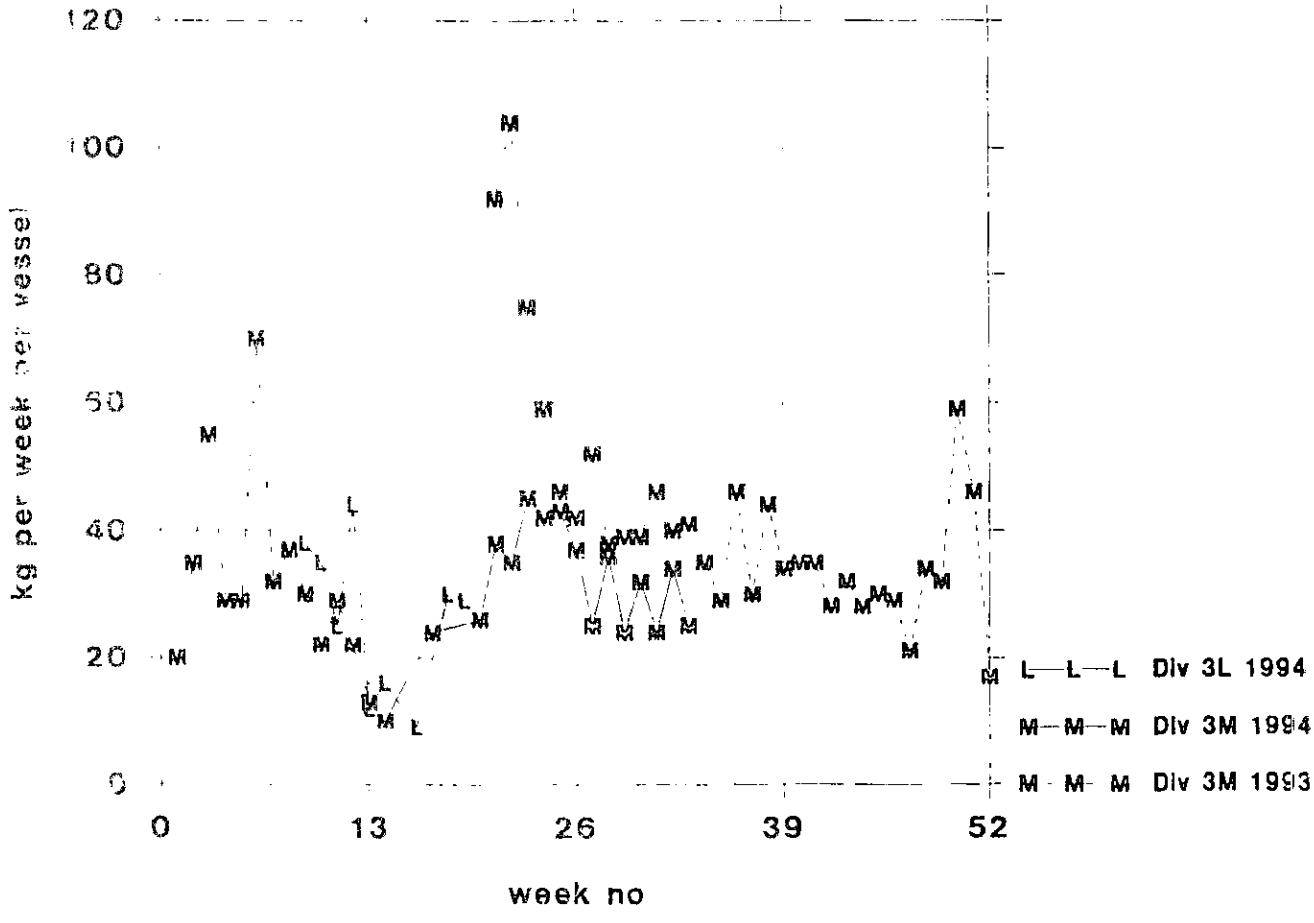

Figure 1 Variation in CPUE (t/week/vessel) in Div 3L and 3M in the period May 1993 to mid Aug 1994.

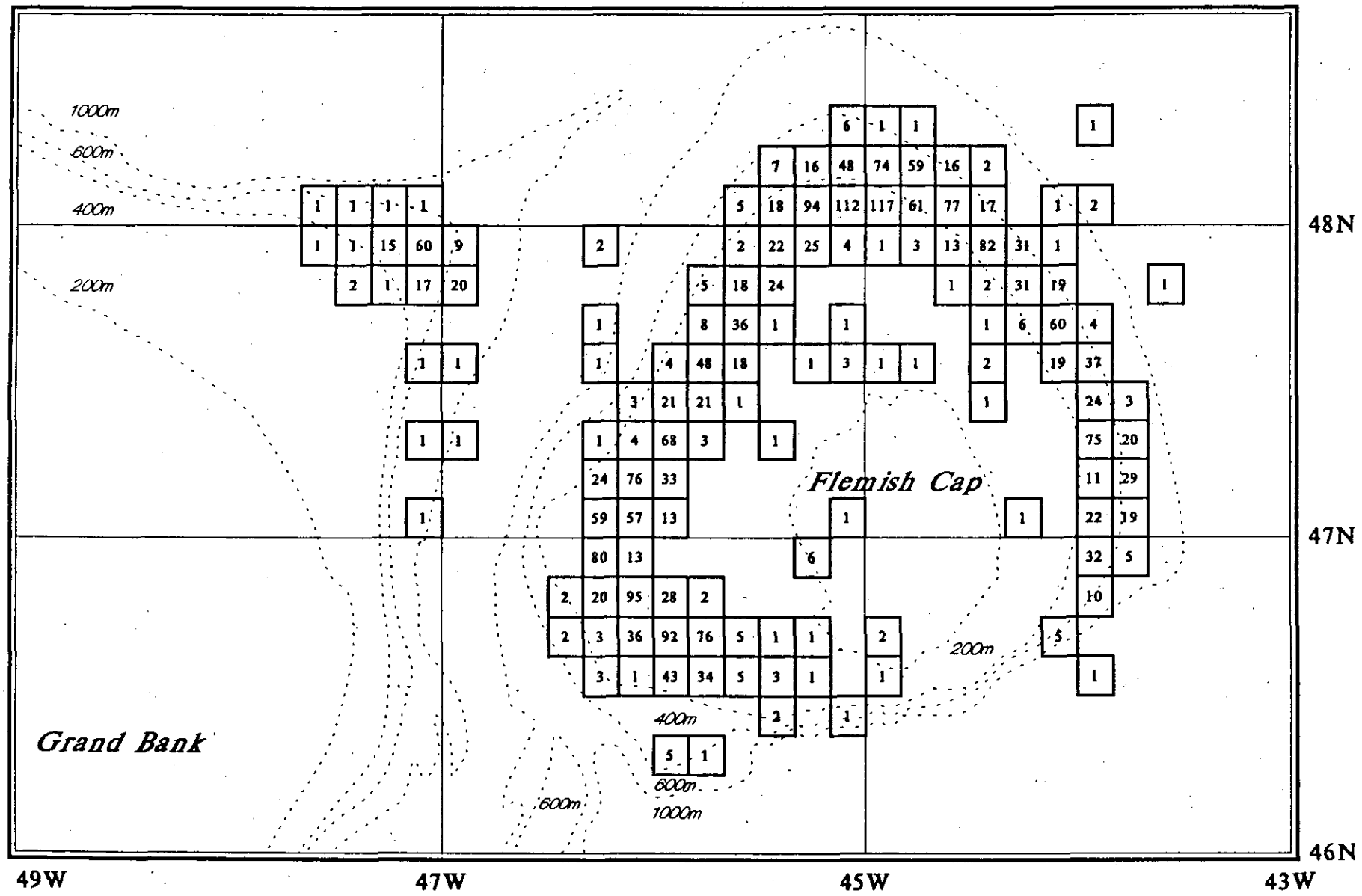

Figure 2 Geographical distribution of hauls in the fishing area in the period May 1993 - Mar 1994. Numbers indicated number of hauls in each square.

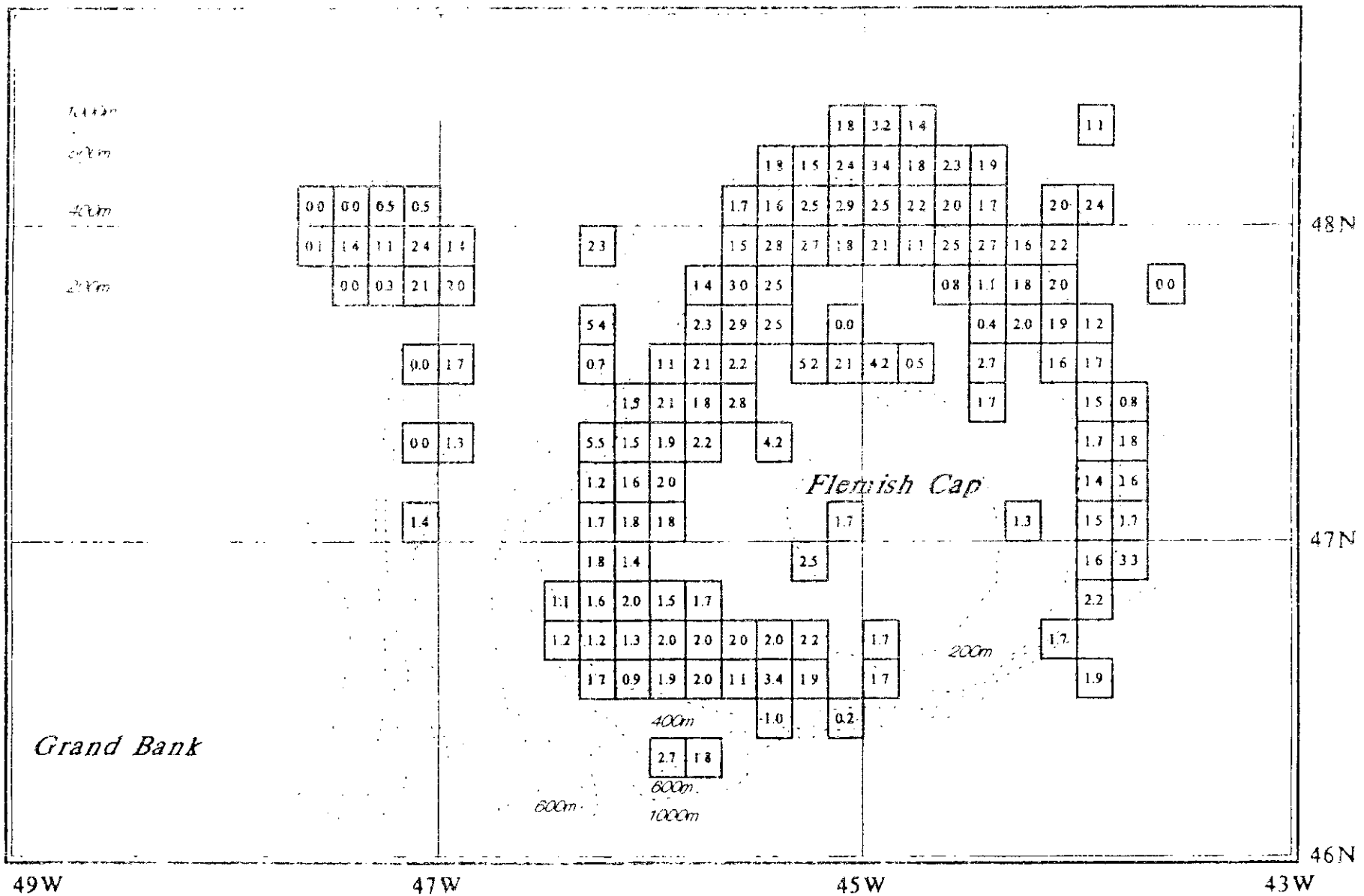

Figure 3 Geographical distribution of density (g/m²) in the fishing area in the period May 1993 - Mar 1994

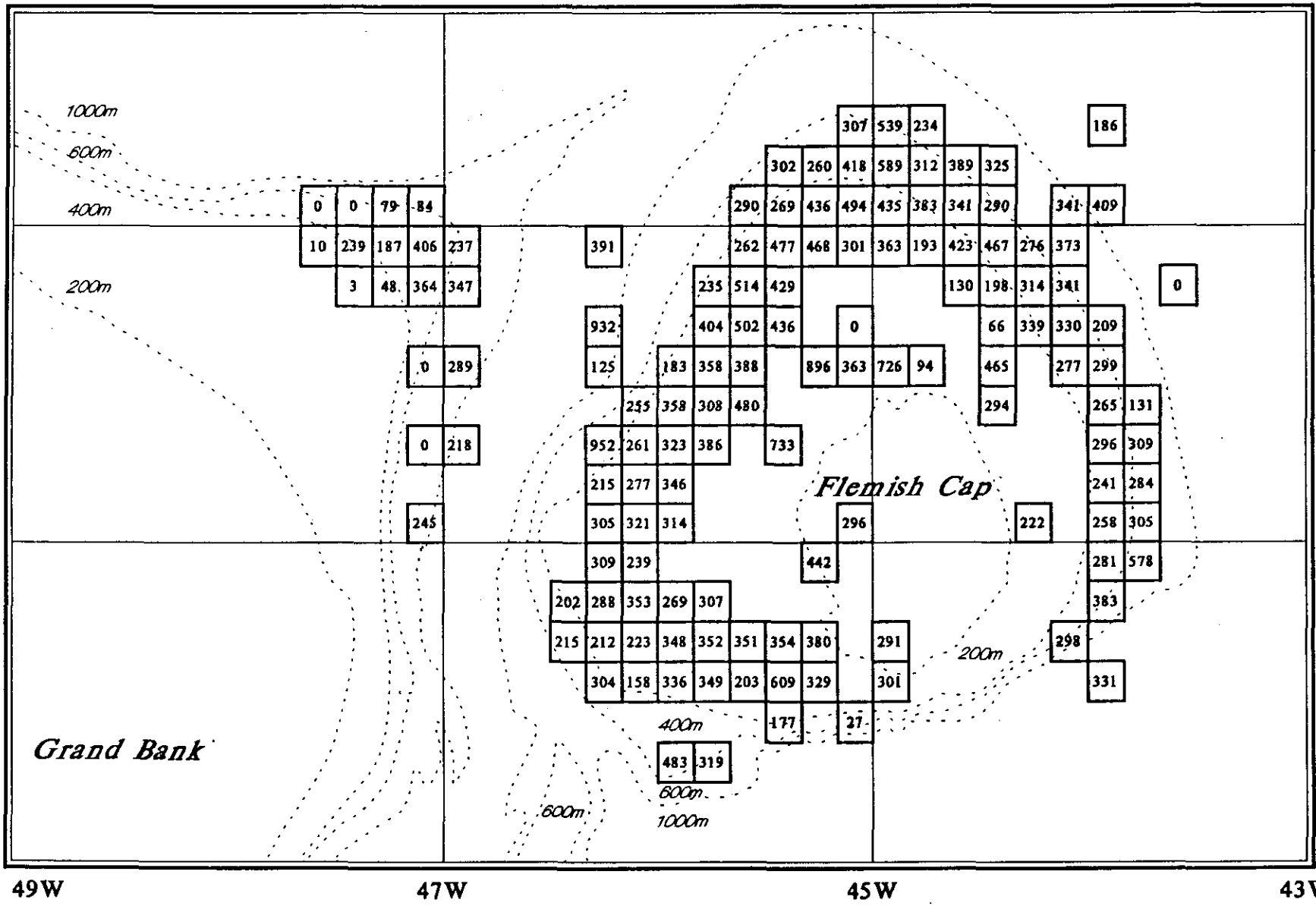

Figure 4 Geographical distribution of biomass (tonnes) in the fishing area in the period May 1993 - Mar 1994.