Northwest Atlantic Fisheries Organization

Serial No. N1897

NAFO SCR Doc. 91/20

SCIENTIFIC COUNCIL MEETING - JUNE 1991

Norwegian Investigations on Shrimp (*Pandalus borealis*) in East Greenland Waters in 1990

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INTRODUCTION

The Norwegian quota of shrimp in East Greenland waters in 1990 was 2500 tonnes. 22 vessels participated in the fishery. According to the fishing log books received, the data in the present paper represents catches of 2434 tonnes.

Results of field investigations together with commercial fishery data in 1989 were reported by Smedstad and Torheim (1990). The results of the investigations together with fishery data in 1990 are presented in this paper.

LOCATION OF THE FISHERY

From 16 February to 29 March one of the authors was an observer on board the sterntrawler "Lyshaug". In the period 23 February to 25 March the fishing area of "Lyshaug" was located around 66° N and west of 30° W (Fig.1).

Fig.7-18 shows the location of the Norwegian fishery from January to december 1990.

MATERIAL AND METHODS

The shrimp were sorted in "landing" and "discard" categories after they were seperated from fish species in the catch.

Details of the trawl hauls examined by the observer are given in Table 1. Random samples of shrimp were taken for length measurements (Carapace length to nearest mm below) (Table 2). In addition length compositions were obtained from by-catches of Greenland halibut (Fig.3), redfish (Fig.4) and cod (Fig.5).

Monthly catch and effort data from 1982-1990 are compilled from the vessels participating in the fishery (Table 3).

SIZE AND SEX COMPOSITION OF SHRIMP

Length compositions in samples collected by the observer on bord "Lyshaug" are given in Table 2 and Fig.2. Shrimp with modal group 30 mm length were dominating. Samples taken from catches fished west of 31° W deeper than 400 m contained more small shrimps than samples taken in the eastern part of the fishing area.

On an average the samples consisted of 44 % males, 0,9 % females without roe, 25,8 % with headroe and 29,4 % were eggbearing (Br - E).

DISCARD

The quantity of discard varied from 0-7,6 %. On an average about 3% of the total catch was discarded.

CATCH AND CATCH PER UNIT EFFORT

Table 3 shows catch and catch per hour trawling (CPUE) by month for the Norwegian fishery off East Greenland (ICES Div. XIV B) from 1984 to 1990. The quarterly CPUE for the period 1982 to 1990 are shown in Fig.6. In 1990 the CPUE for the second quarter increased to 0.15 tonnes per hour, which is at the same level as for the period 1983-1987. However, the CPUE for the third and fourth quarter was at the same low level as in 1989.

BY-CATCHES IN THE SHRIMP FISHERY

By-catches of fish in the trawl hauls of "Lyshaug" examined by the observer are listed in Table 1. The major by-catch continues to be redfish. The categories other consists of skate, plaice and catfish.

None of the fish were kept onboard. The mean number of fish relative to the mean shrimp catch (retained) per tow for the years 1982-1990 are given in the table below.

Mean number per tow

Species	1982	1983	1984	1985	1986	1987	1988	1989	1990
Cod	23	3	3	3	1	9	0	1	1
Greenland halibut	7	9	120	7	1	2	3	3	24
Redfish	53	47	87	74	103	293	421	192	170
Others	13	5	3	17	3	12	9	11	7
Total	96	64	213	101	108	316	433	207	202
Nos of hauls observed	37	21	19	40	19	24	7	39	39
Mean shrimp catch (kg)	608	346	880	732	410	528	300	246	222
Nos of fish per kg shrimp	0,16	0,18	0,24	0,13	0,26	0,60	1,44	0,84	0,90

REFERENCES

Smedstad, O.M. and Torheim,S. 1990. Norwegian Investigations on shrimp (Pandalus borealis) in East Greenland waters in 1989. NAFO SCR Doc.90/11 13p.

Table 1.Catches of shrimp and by-catches of fish in some trawl hauls by M/V "Lyshaug" off East Greenland in Febr.-March 1990.

Nos	Date	Time	Position		Direction towed	Towing time	Shrimpcatches				By-catches (Nos)			
							Landings	Discards		Total	Cod	Gre. hal.	Red fish	Other
		(hr)	N	W		(hr)	Kg	Kg	%	Kg				
1	23 February	0830	65°45'	30°41'	195°	4.00	377	15	3.8	392	-	8	150	6
2	25 February	1115	65°41'	30°40'	180°	3.25	108	3	2.7	111	2	-	150	3
3	26 February	1220	65°15'	30°36'	180°	4.09	604	15	2.4	619	1	108	150	11
4	27 February	0020	66°04'	30°41'	360°	4.16	203	5	2.4	208	1	60	130	5
5	27 February	1015	66°05'	30°35'	360°	3.75	183	6	3.2	189	-	120	30	16
6	28 February	0015	66°11'	30°42'	360°	4.50	235	10	4.1	245	1	50	130	3
7	28 February	1200	66°14'	30°41'	170°	4.50	341	15	4.2	356	1	42	45	5
8	28 February	2205	66°15'	30°45'	160°	4.50	356	12	3.3	368	1	30	60	3
9	1 March	0345	66°04'	30°38'	346°	4.00	162	5	3.0	167	-	24	30	3
10	1 March	0915	66°13'	30°44'	180°	3.50	264	15	5.4	279	-	42	160	3
11	1 March	1350	66°03'	30°42'	120°	4.00	319	10	3.0	329	1	37	48	2
12	1 March	2345	66°07'	30°43'	340°	4.25	193	7	3.5	200	-	65	70	5
13	2 March	0930	66°07'	30°40'	340°	4.00	213	2	0.9	215	-	51	200	3
14	3 March	1220	66°19'	30°31'	350°	4.00	252	10	3.8	262	-	9	150	-
15	3 March	2125	66°23'	30°28'	360°	4.00	274	6	2.1	200	-	45	42	-
16	4 March	2310	66°24'	30°30'	350°	4.25	248	2	0.8	250	-	52	20	-
17	5 March	1350	66°14'	30°43'	40°	3.91	94	-	-	94	-	84	10	3
18	6 March	1215	65°45'	30°47'	220°	2.50	65	-	-	65	-	6	200	7
19	7 March	1130	65°38'	31°03'	40°	2.50	86	1	1.1	87	-	5	300	19
20	7 March	1500	65°40'	30°54'	240°	2.16	129	2	1.5	131	-	5	200	13
21	8 March	1440	65°36'	30°44'	450°	4.16	84	2	2.4	83	1	5	200	11
22	8 March	1945	65°44'	30°52'	180°	4.16	243	3	1.2	246	1	3	150	7
23	9 March	0130	65°31'	30°33'	10°	4.50	185	5	2.6	190	-	4	250	6
24	9 March	0755	65°46'	30°28'	160°	3.50	387	2	0.5	389	1	6	200	6
25	9 March	1225	65°38'	30°35'	340°	3.00	314	8	2.5	322	1	3	150	5
26	12 March	1120	65°45'	30°40'	280°	3.33	138	7	4.9	145	2	10	400	6
27	13 March	0025	65°40'	30°40'	240°	4.58	34	-	-	34	5	6	300	17
28	13 March	1100	65°46'	30°39'	280°	4.00	27	2	0.9	29	-	5	350	7
29	16 March	1210	65°53'	30°34'	230°	4.00	240	6	2.4	246	1	10	450	4
30	17 March	2230	65°47'	30°42'	250°	4.00	241	20	7.6	261	-	6	600	10
31	18 March	2100	65°55'	30°30'	360°	5.00	442	20	4.3	462	-	9	50	14
32	20 March	0815	65°59'	30°29'	340°	5.00	278	15	1.8	283	-	12	70	16
33	20 March	1420	66°15'	30°31'	180°	5.00	497	20	3.9	517	-	4	100	10
34	21 March	0920	66°03'	30°31'	190°	5.00	154	8	5.0	162	-	13	200	13
35	23 March	2301	65°48'	30°33'	190°	4.50	141	1	0.7	142	2	5	150	8
36	24 March	0020	65°45'	30°43'	220°	3.58	212	2	0.9	214	-	5	400	28
37	24 March	0435	65°36'	30°58'	340°	2.00	142	6	4.1	148	-	-	150	3
38	24 March	1755	65°36'	30°58'	200°	4.33	129	22	1.5	131	-	-	100	8
39	25 March	0325	65°50'	30°40'	170°	5.00	89	-	-	89	-	2	100	7

Table 2. Length composition of random samples from shrimp catches by M/V "Lyshaug" off East-Greenland in February-March 1990.(Numbers in heading refers to tow number in the first column of Table 1)

Carapace-length (mm)	3	5	6	8	12	13	14	17	19	23	25	26	28	30	31	36	TOTAL
15	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	1
16	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	1
17	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	1
18	-	-	2	3	-	3	3	-	1	-	3	1	-	1	-	1	18
19	1	-	2	6	-	3	2	1	2	1	4	4	2	1	-	4	33
20	5	-	9	7	1	4	14	5	2	-	3	4	5	10	9	6	84
21	10	1	9	12	1	7	15	3	6	2	5	10	4	13	8	9	115
22	14	3	25	17	2	14	28	4	12	2	9	19	11	12	17	13	202
23	22	8	17	28	10	13	33	18	11	1	12	13	10	12	17	22	247
24	17	6	17	16	7	21	18	17	12	3	12	12	10	14	22	10	214
25	23	13	19	17	10	19	23	17	6	5	11	10	9	8	18	11	219
26	10	8	16	15	8	13	14	10	11	9	5	11	11	12	17	23	193
27	18	14	13	11	7	13	16	15	8	4	8	27	10	9	24	15	212
28	27	11	20	23	13	15	13	17	17	14	6	33	4	23	24	19	279
29	37	20	19	26	17	28	16	19	34	22	21	21	16	29	23	31	379
30	49	30	23	57	50	37	38	34	57	30	36	34	14	38	46	56	629
31	25	23	16	43	16	31	27	25	39	32	20	26	7	30	34	37	431
32	16	12	8	17	9	16	13	16	19	21	20	12	5	10	19	25	238
33	6	6	1	10	4	6	4	5	11	11	3	5	-	4	9	8	93
34	2	5	3	-	1	-	-	3	3	1	1	1	-	-	1	2	23
35	-	-	-	-	-	-	1	-	-	-	-	1	-	-	-	-	2
Total	282	160	219	308	156	243	279	209	251	158	180	245	118	226	288	292	3614

Table 3. Catch (tonnes) and catch per hour trawling in division XIV B from 1984 to 1990.

Month	1984		1985		1986		1987		1988[1]		1989[2]		1990[3]	
	Catch	CPUE	Catch	CPUE	Catch	CPUE	Catch	CPUE	Catch	CPUE	Catch	CPUE	Catch	CPUE
Jan.	-	-	-	-	31	0.112	-	-	2	0.050	84	0.199	122	0.077
Feb.	79	0.232	-	-	208	0.141	150	0.187	273	0.112	64	0.129	177	0.073
Mar.	622	0.224	760	0.184	737	0.166	565	0.140	305	0.076	161	0.070	274	0.070
April	732	0.183	995	0.166	548	0.133	601	0.123	343	0.074	380	0.088	122	0.066
May.	500	0.167	269	0.137	337	0.131	196	0.133	323	0.082	16	0.035	450	0.237
Jun.	-	-	-	-	-	-	-	-	28	0.108	14	0.026	-	-
Jul.	-	-	-	-	2	0.071	-	-	1	0.038	-	-	14	0.038
Aug.	-	-	-	-	116	0.131	32	0.124	218	0.096	56	0.035	80	0.037
Sep.	-	-	-	-	47	0.110	224	0.135	281	0.086	239	0.037	278	0.043
Oct.	-	-	-	-	-	-	187	0.091	176	0.071	402	0.055	316	0.052
Nov.	-	-	-	-	-		57	0.047	18	0.061	287	0.047	363	0.052
Dec.	-	-	-	-	-	-	-	-	-	-	271	0.094	238	0.068
TOTAL	1933	0.191	2024	0.166	2026	0.143	2012	0.123	1968	0.083	1974	0.060	2434	0.065

[1] 96% of the quota
[2] 96% of the quota
[3] 97% of the quota

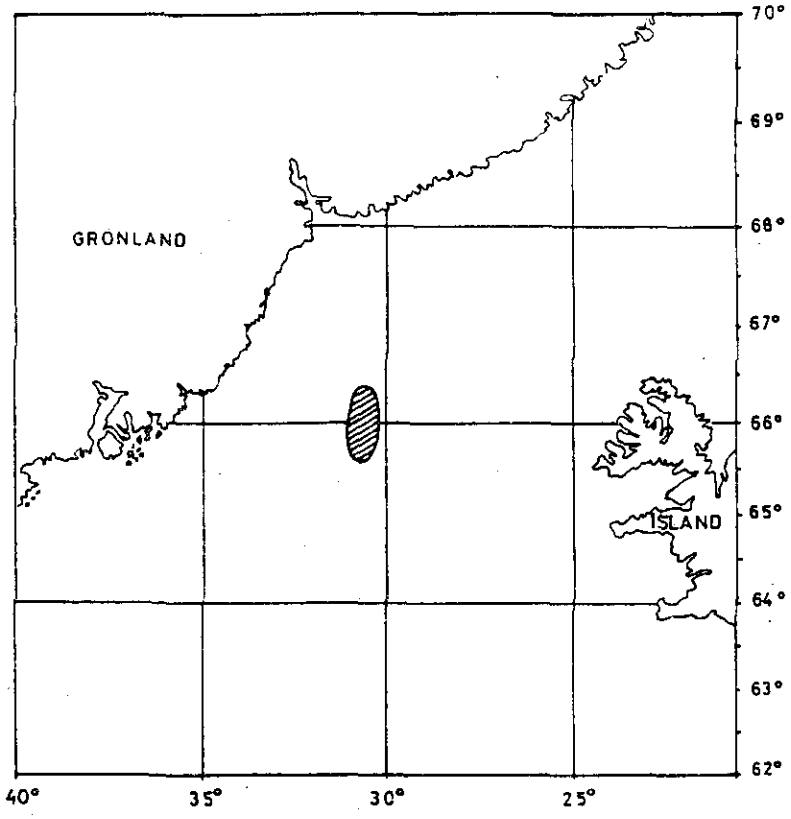

Fig. 1. Hatched area: Area fished by M/V Lyshaug during the stay of the observer in February-March 1990.

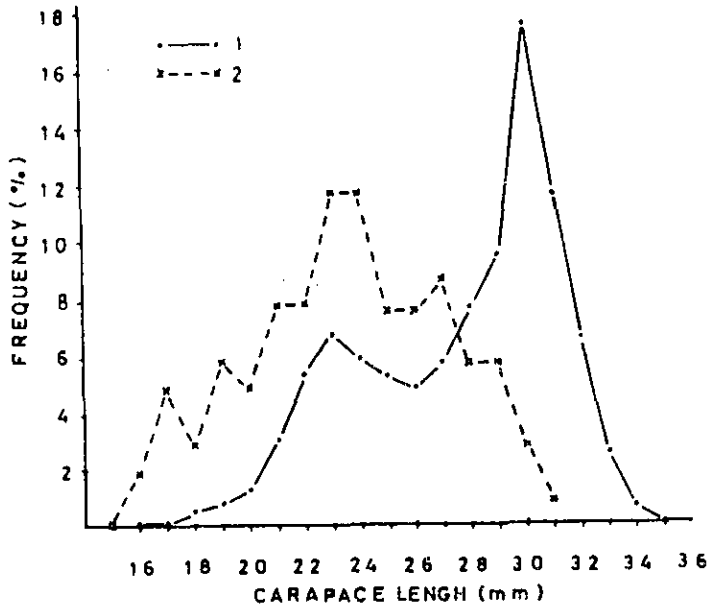

Fig.2. Weighted mean length composition of shrimp samples taken off East Greenland in February-March 1990. 1) landed shrimp, 2) discarded shrimp.

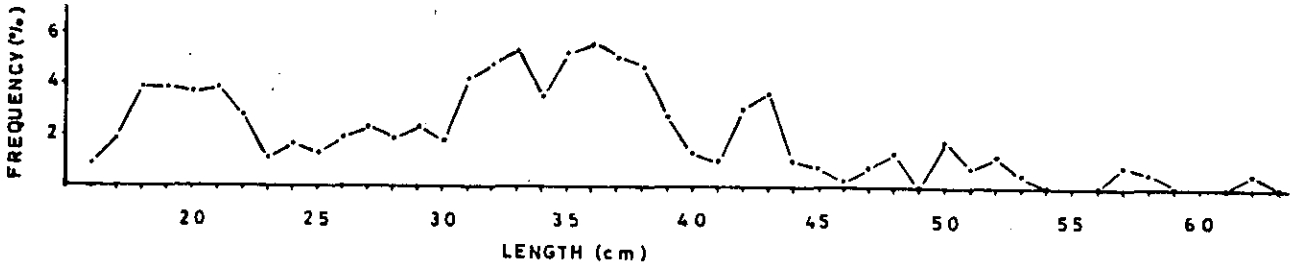

Fig.3. Length composition of Greenland halibut taken as by-catch with shrimp off East Greenland in February-March 1990.

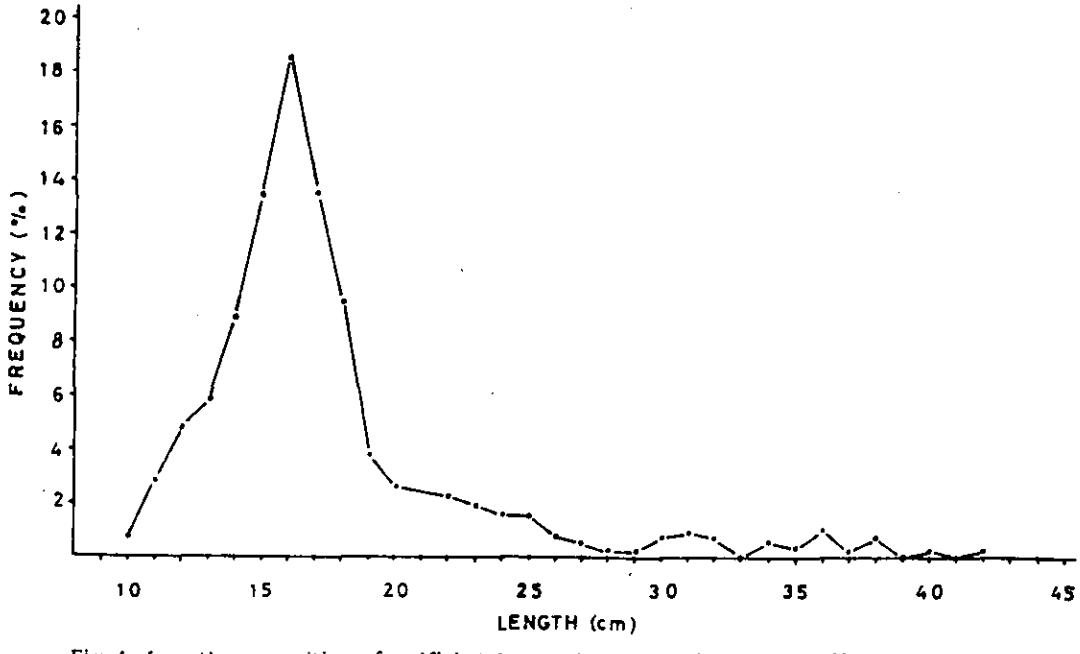

Fig.4. Length composition of redfish taken as by-catch with shrimp off East Greenland in February-March 1990.

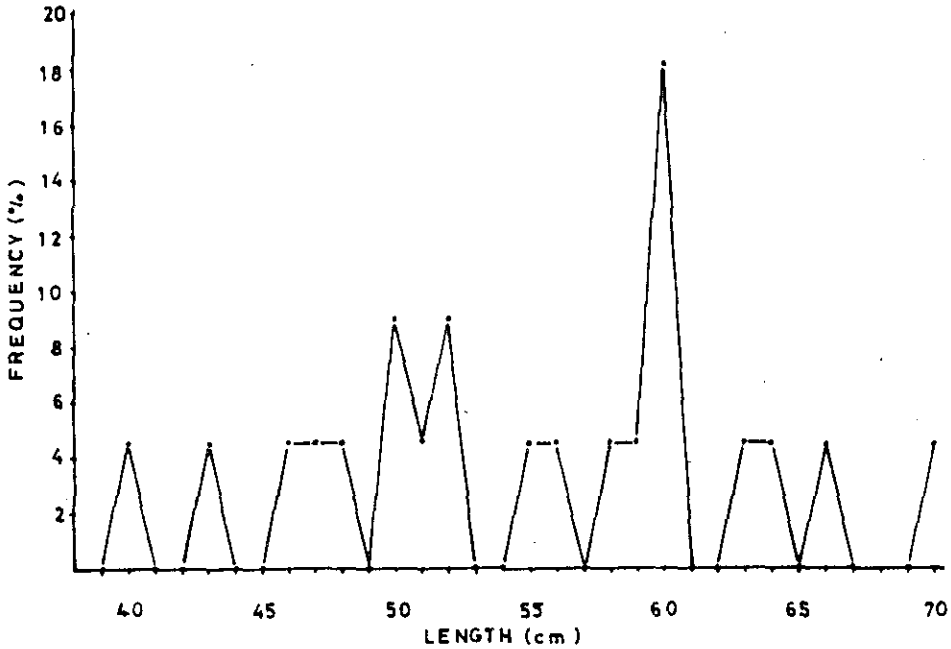

Fig.5. Length composition of cod taken as by-catch with shrimps off East-Greenland in February-March 1990.

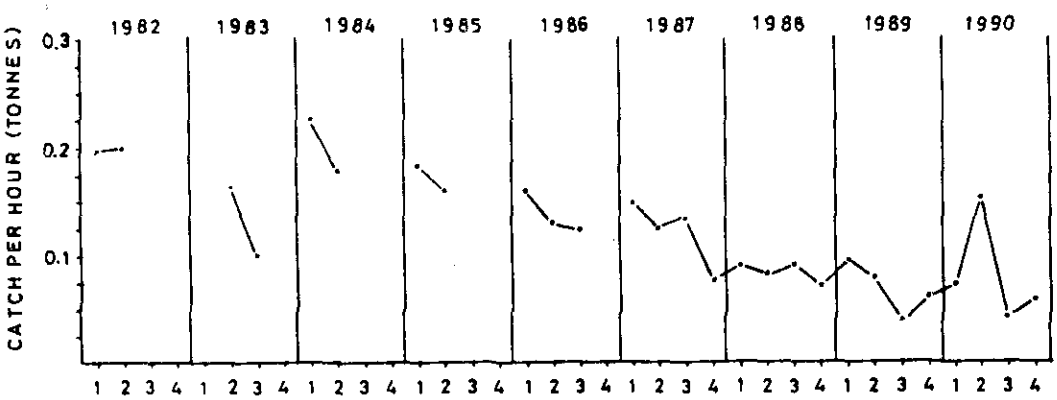

Fig.6. Quartely mean shrimp catch per hours trawling by Norwegian vessels in Div. XIV B, 1982-1990.

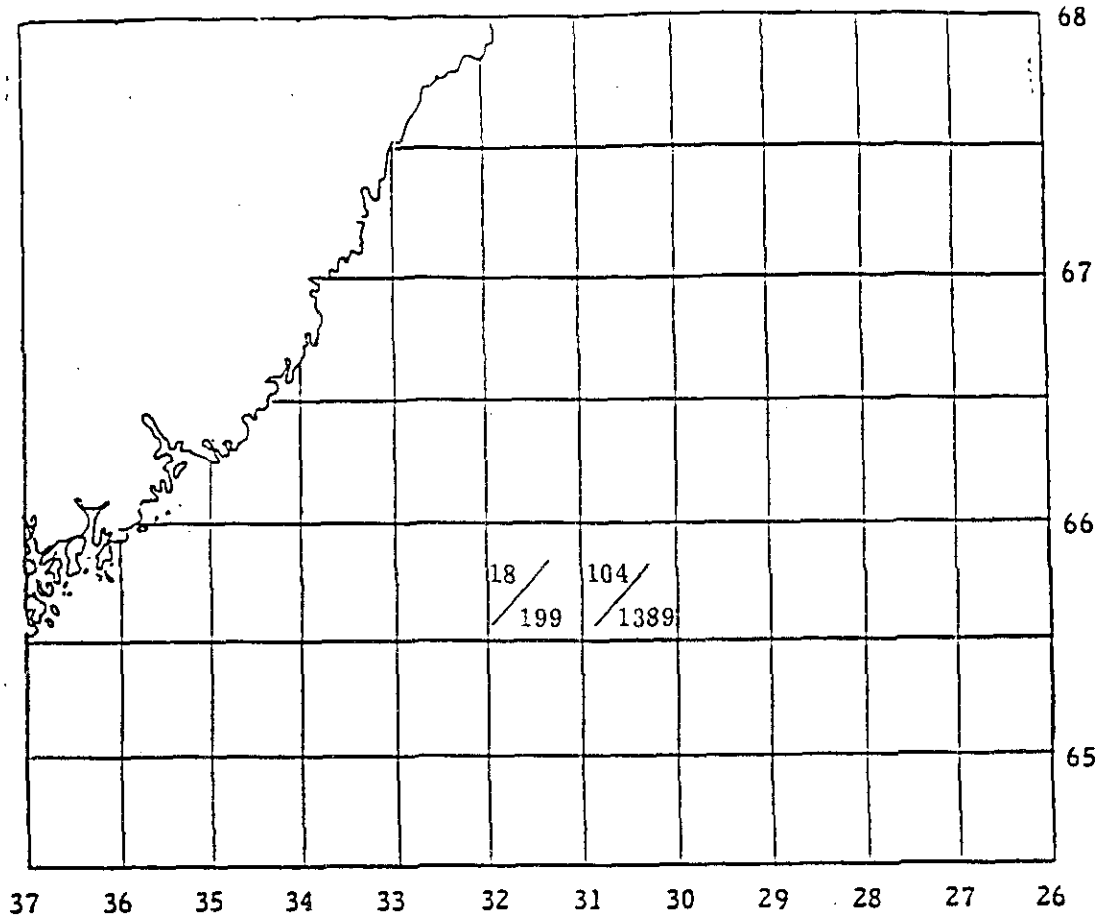

Fig.7. January (Catch in tonnes/ hours fished).

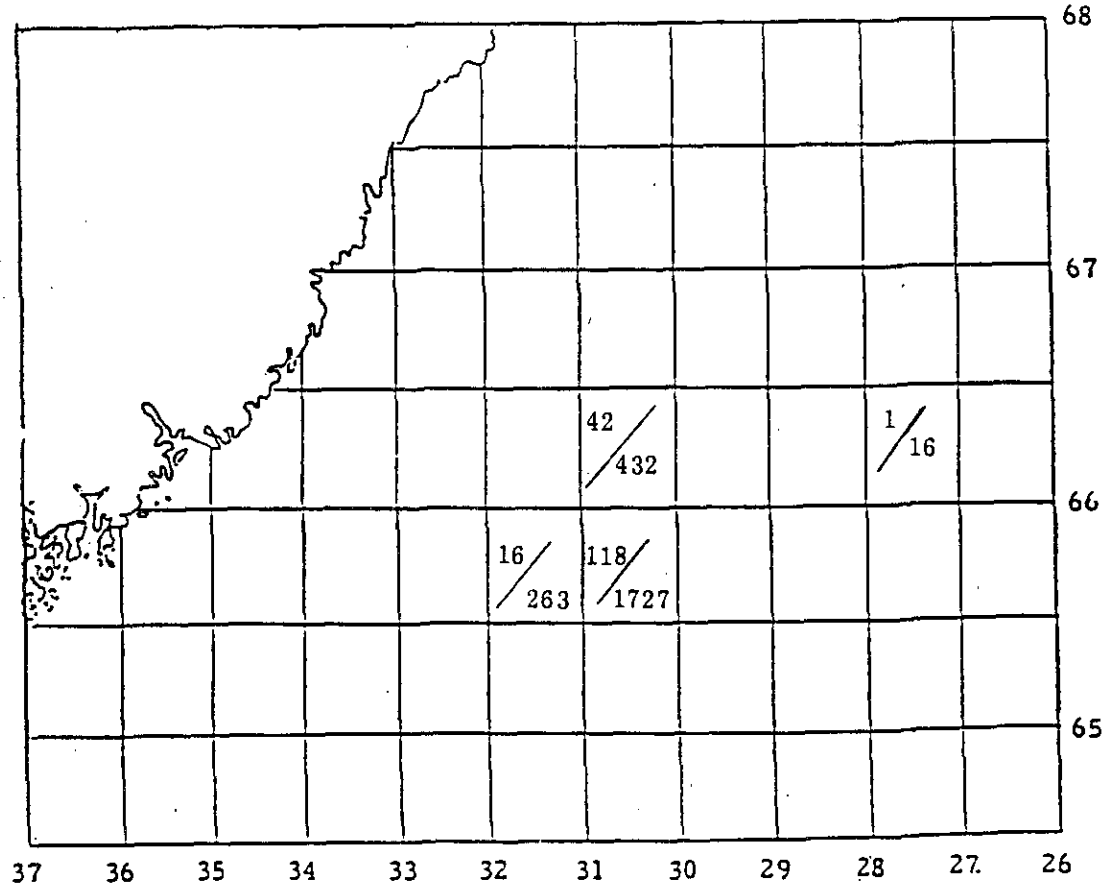

Fig.8 February (Catch in tonnes/ hours fished)

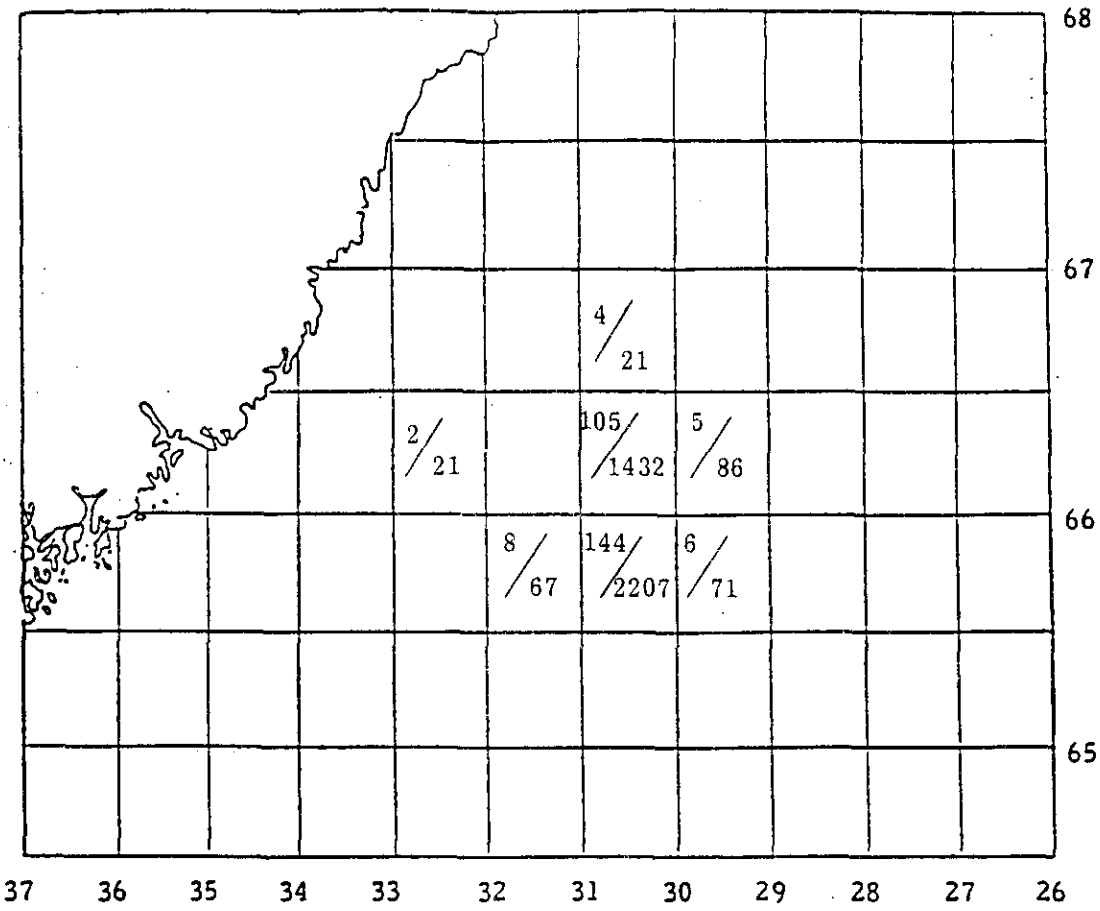

Fig. 9. March (Catch in tonnes/ hours fished).

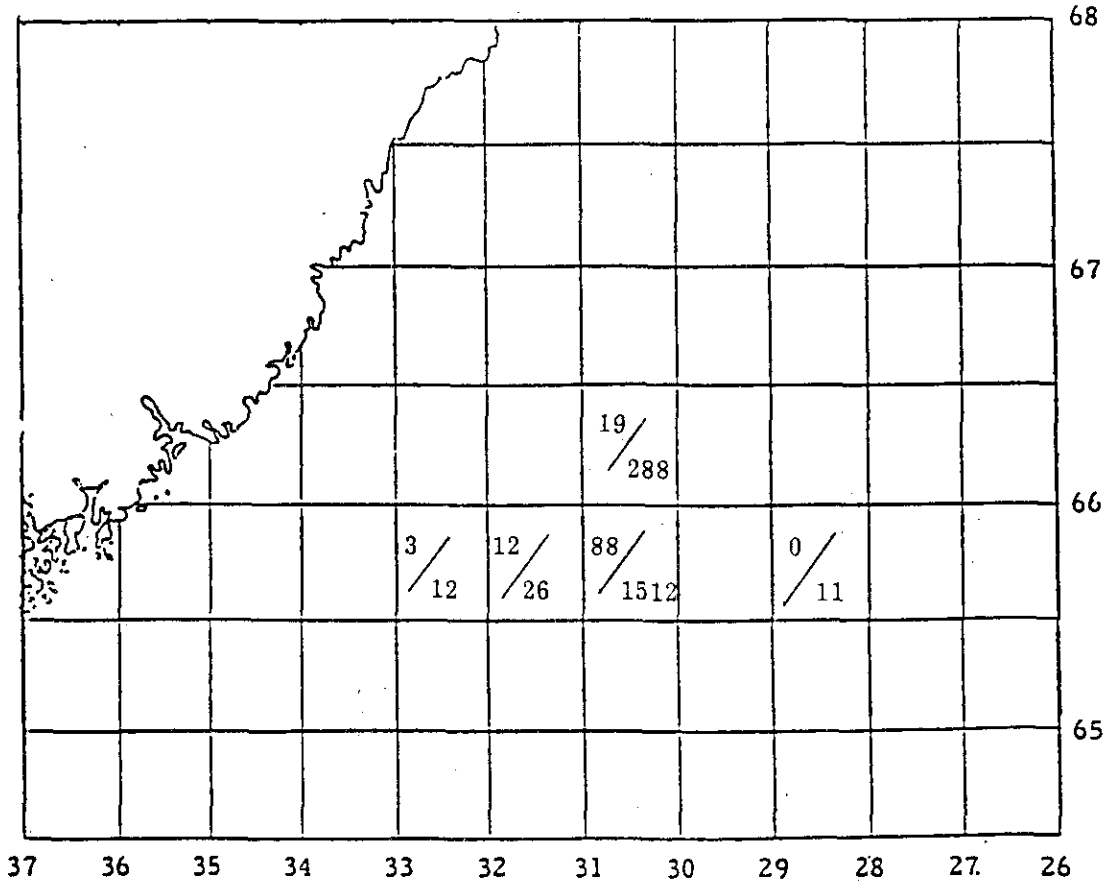

Fig. 10. April (Catch in tonnes/ hours fished).

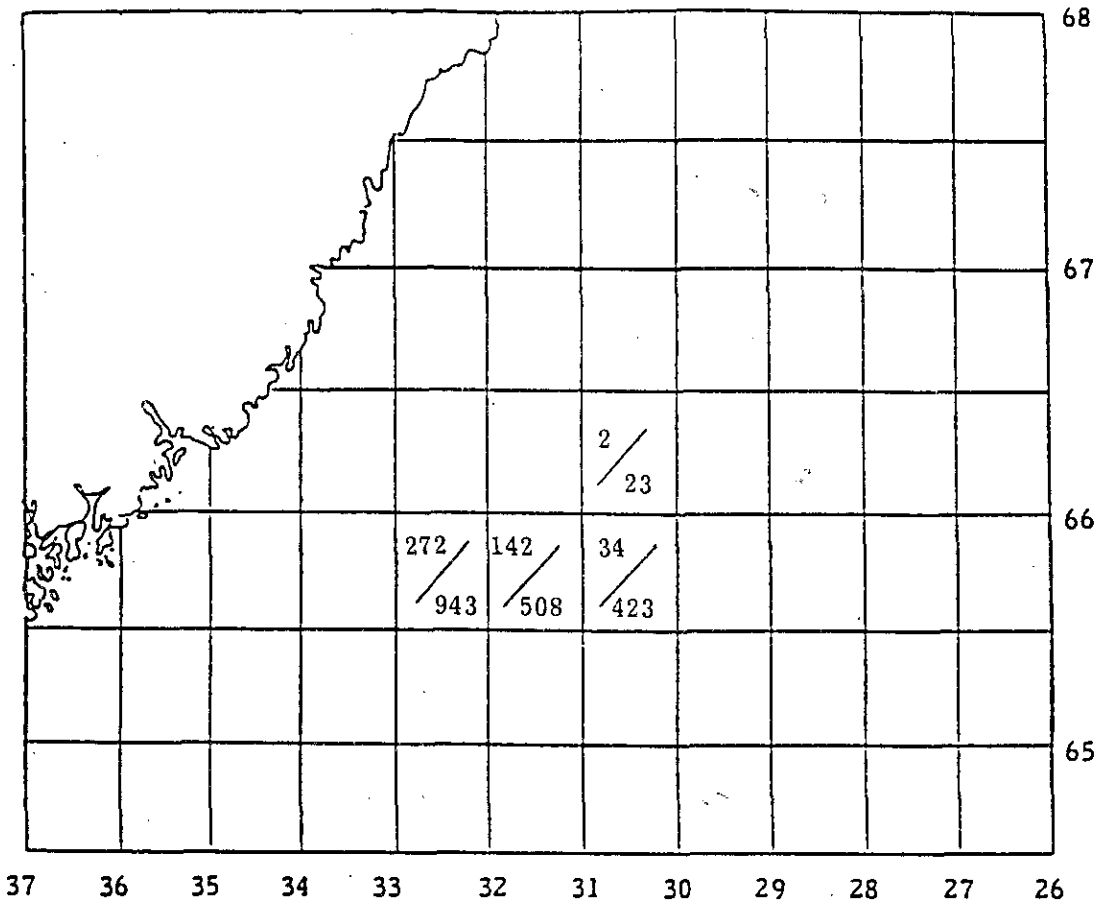

Fig. 11. May (Catch in tonnes/ hours fished).

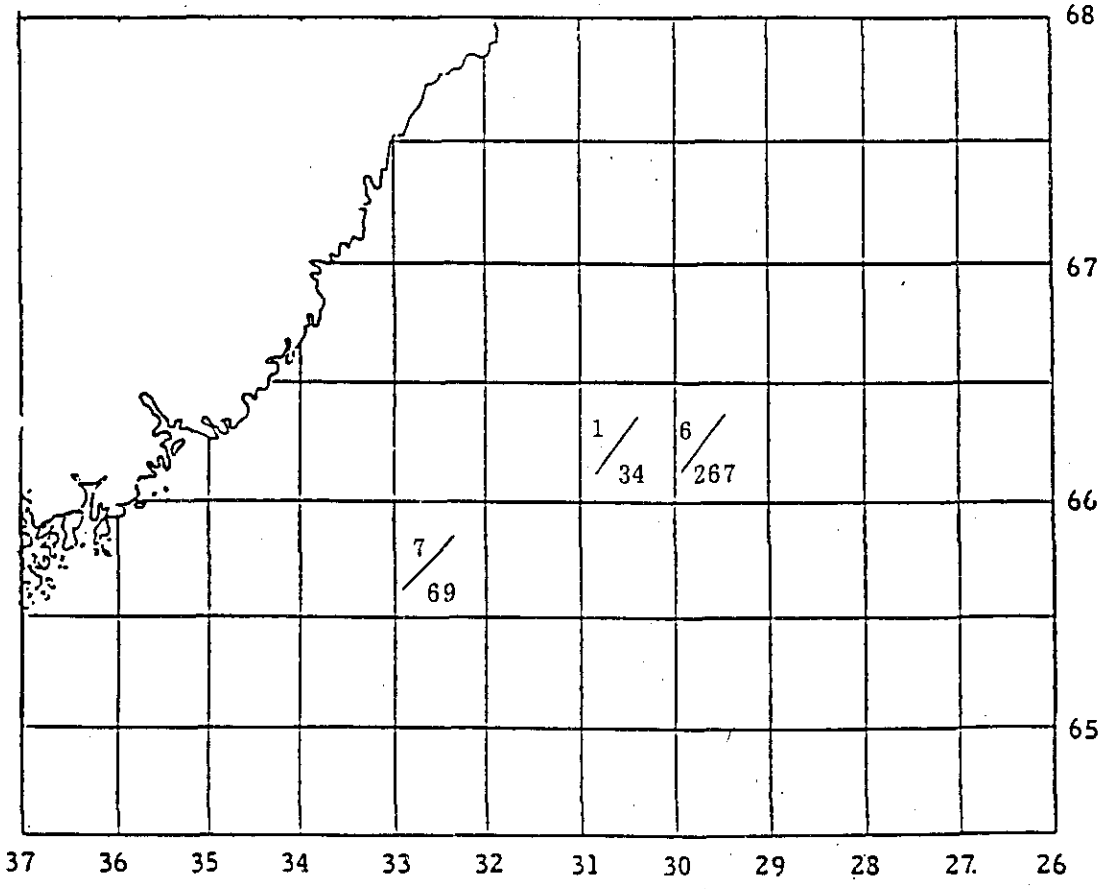

Fig. 12. July (Catch in tonnes/ hours fished).

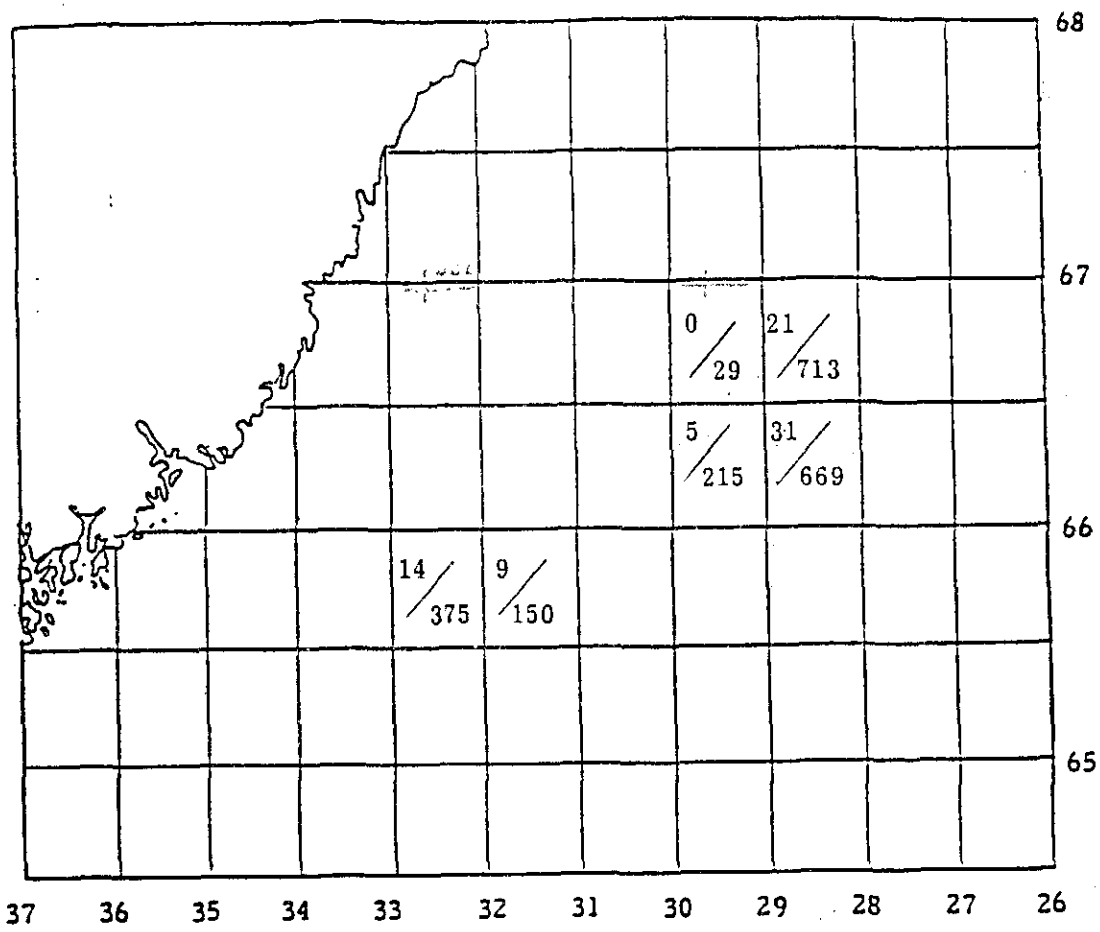

Fig.13. August (Catch in tonnes/ hours fished).

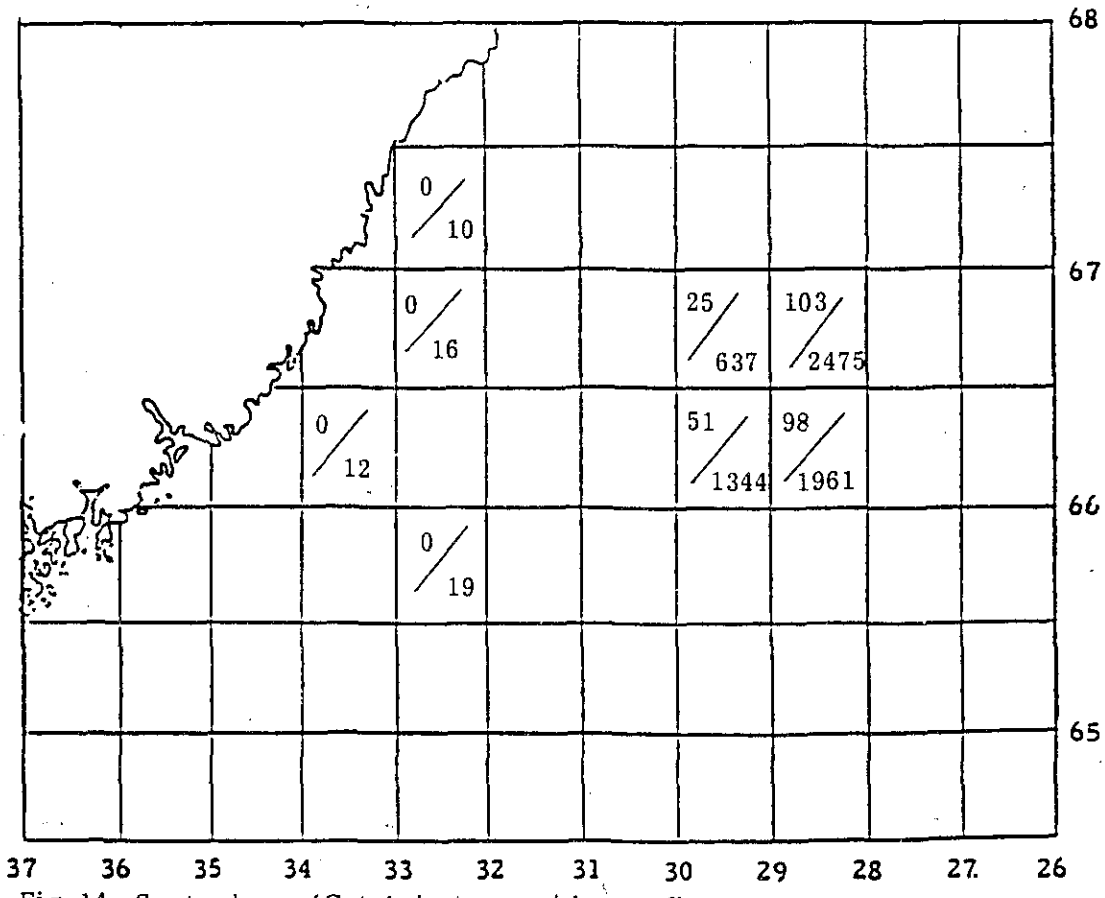

Fig.14. September (Catch in tonnes/ hours fished).

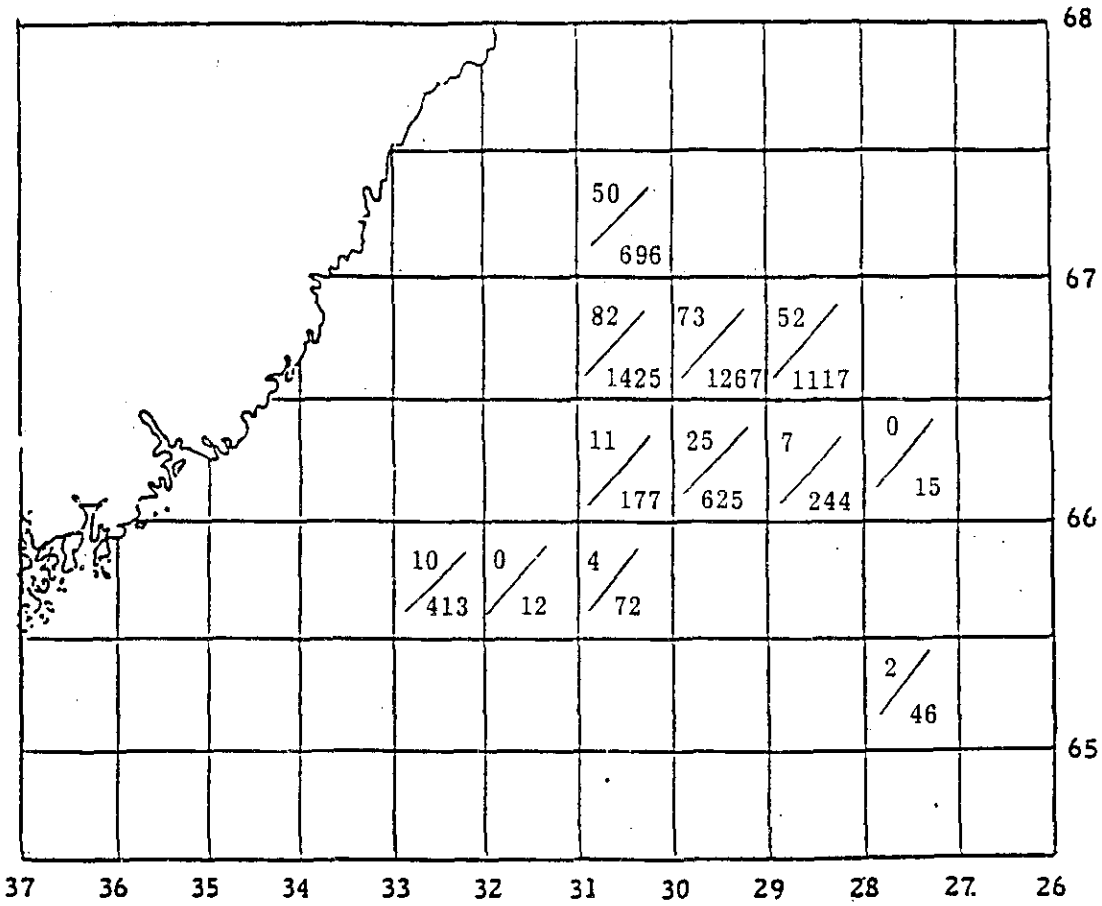

Fig.15. October (Catch in tonnes/ hours fished).

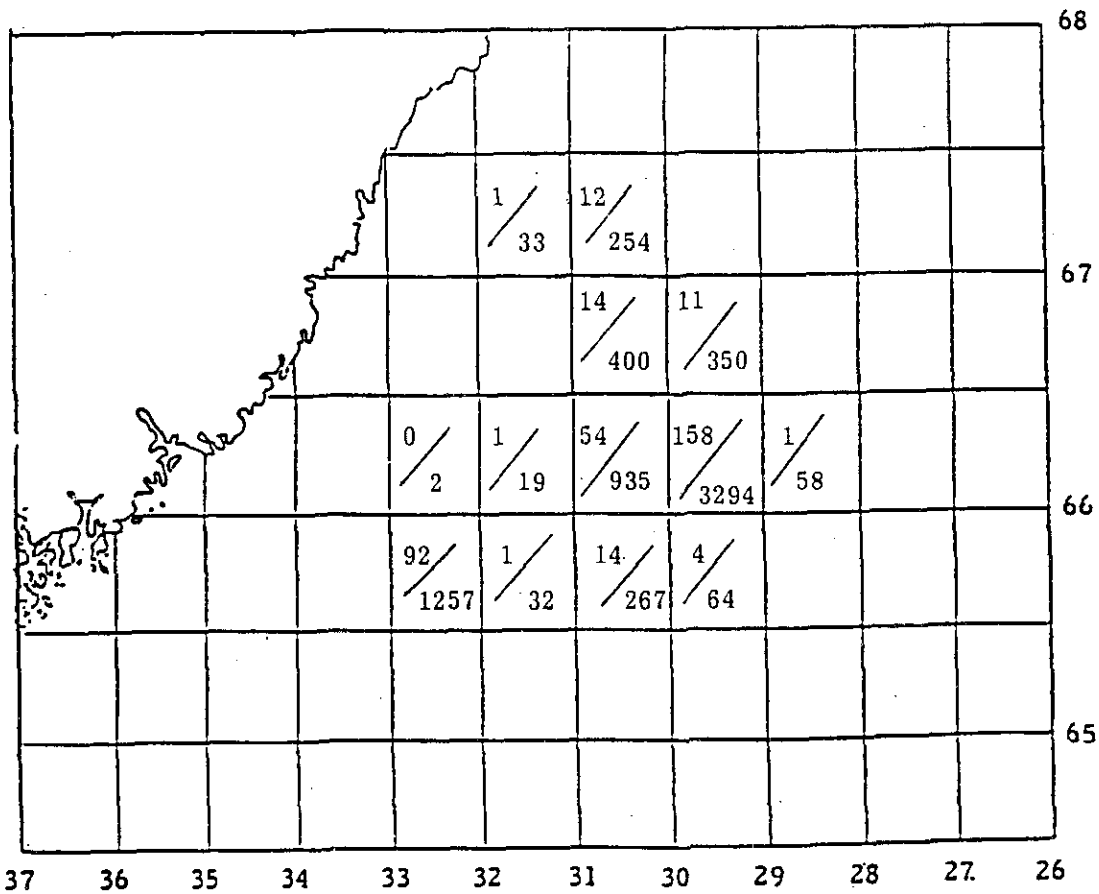

Fig.16. November (Catch in tonnes/ hours fished).

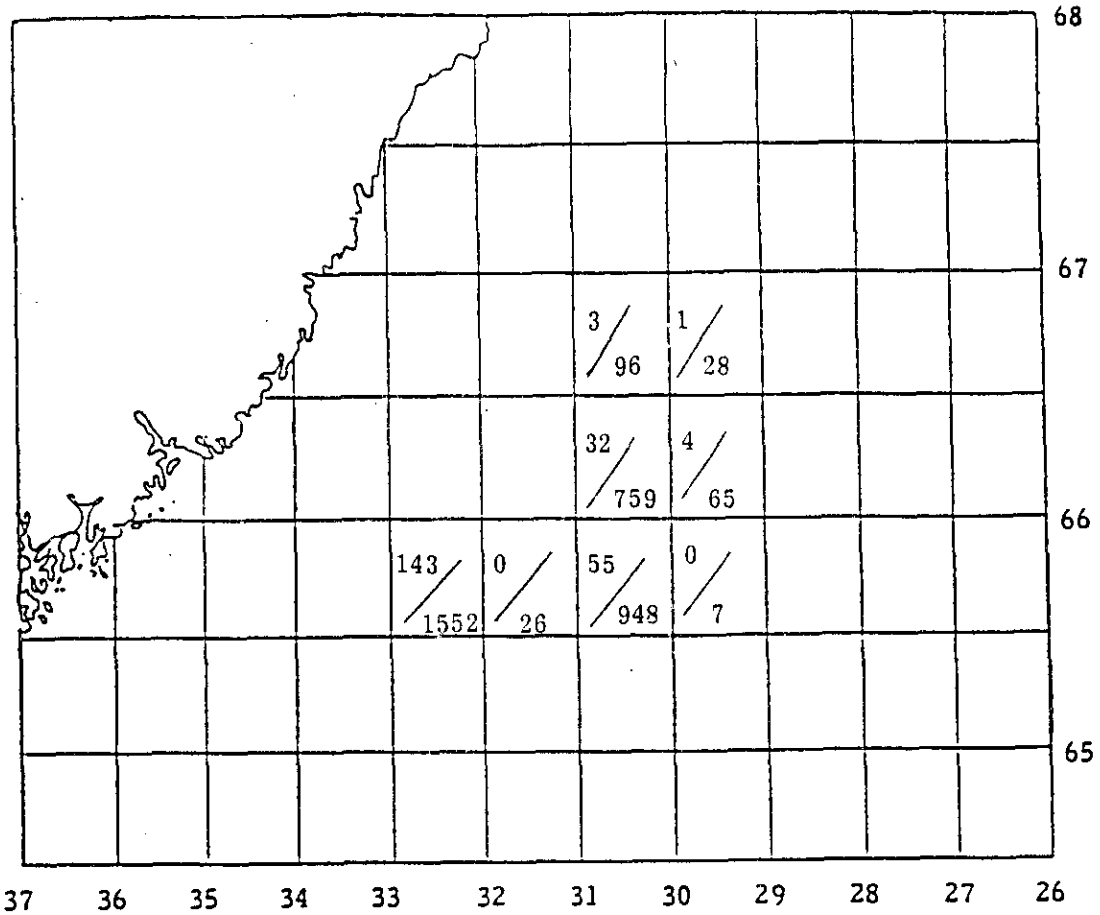

Fig.17. December (Catch in tonnes/ hours fished).

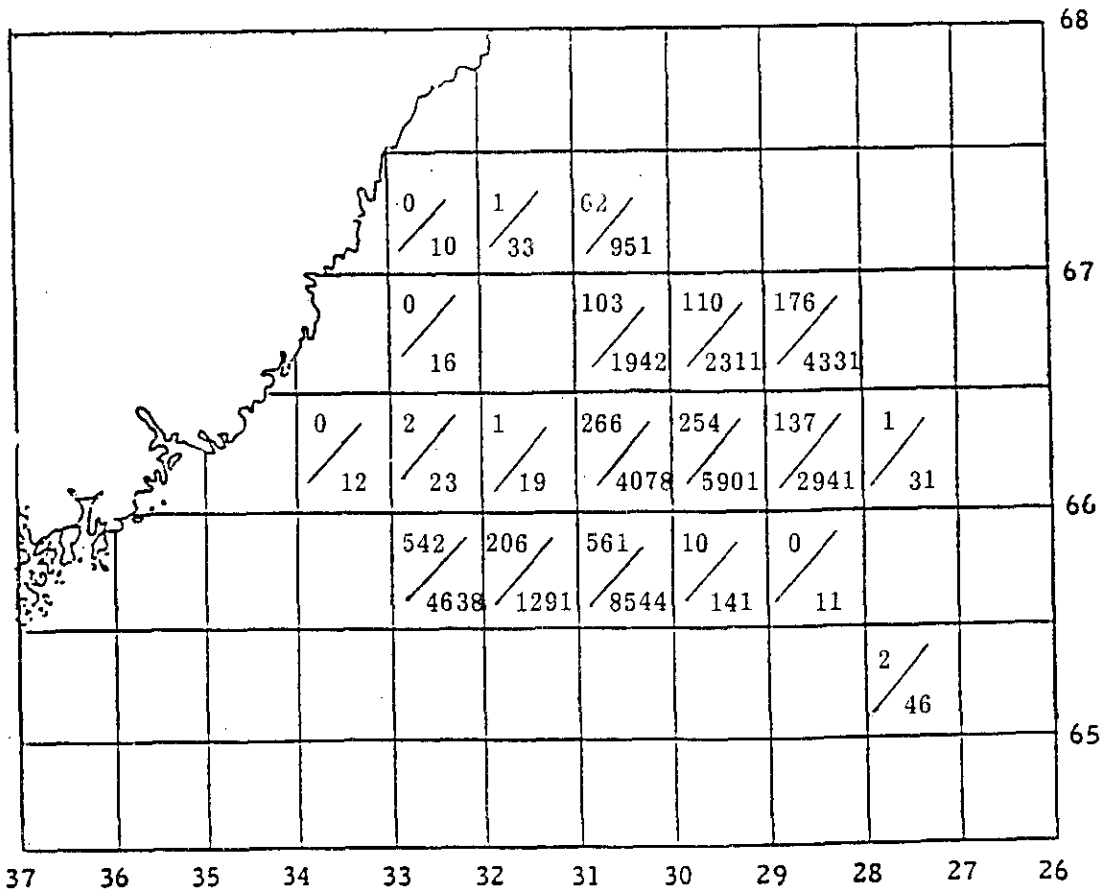

Fig.18. Total (Catch in tonnes/ hours fished).