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Japanese Research Report, 1970

by Ikuo Ikeda

(Far Seas Fisheries Research Laboratory)

Japanese exploratory fishery in ICNAF Area started from 1968 with a single trawler and continued in 1969 in the Subareas 5, 6 and some other areas. In 1970 Japan joined the Convention and released the operation for commercial trawlers in the Convention Area. Most catch, 83% of the total, was from the Statistical area with 16 trawlers. The catch of 4,451 tons in Subarea 5 was from Divisions 5Zw and 5Ze and mainly consists of squids and herring. 80% of squids was caught in 5Zw, and herring was mainly from 5Ze.

Table 1. Summary of Japanese trawl fishery from 1967 to 1970.

Year	Total catch in tons	Remark
1967	452	Subarea 6 only. Main spp.: butterflyfish, argentine.
1968	14,271	Exploratory trawler. Main spp.: butterflyfish, squids, redfish, argentine. SA 1: 137 tons, SA 2: 190 tons, SA 3: 1,672 tons, SA 4: 2,012 tons, SA 5: 724 tons, SA 6: 6,536 tons.
1969	19,669	Exploratory trawler. Main spp.: squids, butterflyfish, argentine. SA 1: 7 tons, SA 2: 1 ton, SA 3: 801 tons, SA 4: 1,936 tons, SA 5: 8,789 tons, SA 6: 8,133 tons.
1970*	16,184	Main spp.: squids, butterflyfish, argentine. SA 3: 2,997 tons, SA 4: 2,173 tons, SA 5: 1,800 tons, SA 6: 9,206 tons.

* preliminary figure.

Subarea 3

A Status of the Fishery

Japanese trawl fishery in Subarea 3 is still in exploratory stage and main species caught is argentine. Fishing grounds of argentine were 3M, 3Ps and 3L.

Table 2. Japanese catch in Surarea 3.

Year	1968	1969	1970*
Hours fished	1,043	410	
Total catch (tons)	1,672	801	2,997
Argentine	145	106	1,893
Redfish	774	533	945
Cod	574	83	10
Haddock	6	1	3
Flatfishes	38	21	12

* preliminary figure.

B Special Research Studies

Biological Studies

Length measurements for redfish, cod and argentine were made on board of trawlers.

Size compositions of redfish are shown in Fig. 1, by divisions for spring and autumn respectively. Fig. 1 shows that 3M in spring and 3L in autumn have similar distribution with two peaks, 28-29 cm and about 35 cm in fork length. And the fish included in the peak at younger age was mostly immature. It is suggested that recruitment to fishery in 3M occurred in spring and in 3L in autumn.

Subarea 4

A Status of the Fishery

Japanese trawlers in this Subarea caught argentine and redfish mostly. Main fishing locality was the continental slope of Browns Bank (4X).

Table 3. Japanese catch in Subarea 4.

Year	1968	1969	1970*
Hours fished	1,075	896	
Total catch (tons)	2,012	1,936	2,173
Argentine	1,086	1,256	1,330
Redfish	524	251	486
Mackerel	19	1	2
Herring	9	14	22
Silver hake	76	213	98
Cod	21	39	60
Haddock	18	20	7
Flatfishes	28	21	8
Squids	94	-	24

* preliminary figure.

B Special Research Studies

Biological Studies

Length measurements for argentine, redfish and other few species were made on board of commercial trawlers. Argentine. Size compositions by divisions and by months are shown in Fig. 2. Modal length in winter is generally bigger than that in summer on both 4W and 4X. The studies on diurnal movement and relation among depth, temperature and catch were also carried out. Analyzing catch data of approximately 42° N, 65°30' W in winter, it is found that the species makes strong diurnal movement, bottom in the daytime and mid-layer at night, since the mean value of catch per effort in daytime was 4.65 tons per hour against the value in the night was 1.17 tons per hour. The relation among depth, bottom temperature and the catch of argentine per effort (per hour) in Browns Bank is shown in the following table.

Table 4. Catch per effort of argentin for each depth zone and bottom temperature.

Depth in m	Bottom temperature (°C)														
	5.0	5.5	6.0	6.5	7.0	7.5	8.0	8.5	9.0	9.5	10.0	10.5	11.0	11.5	12.0
150					3.50										
175															
200			1.68	2.56	1.79	2.25	5.51		4.13				3.00		2.47
225	5.02		3.11	6.29	3.90	2.65	3.78	5.28				3.00			
250	2.90	6.16	4.45	5.02	4.32	3.35	5.09	4.20	11.19	4.64	4.37	3.87			
275							4.14								

(Figures in the table represent catch per effort in tons)

From the table it is assumed that dense concentration of argentine was made in the range from 5.0°C to 10.0°C of bottom temperature and in the depth zone of 175 to 250 meter, especially in 200 - 250 meter.

Subarea 5

A Status of the Fishery

Japanese trawlers operated mainly on Georges Bank and about half of total catch was squids, which mainly consist of the short finned squid, *Illex illecebrosus*, and common American squid, *Loligo pealeii*. Herring catch in 1970 increased from the previous year, but butterfish catch decreased. The fishing activities for butterfish in 1970 was conducted mainly in Subarea 6.

Table 5. Japanese catch in Subarea 5.

Year	1968	1969	1970
Hours fished	540	8,216	
Total catch (tons)	724	8,789	1,800
Argentine	-	976	241
Redfish	0	61	66
Butterfish	328	1,291	37
Mackerel	1	197	15
Herring	1	527	1,125
Silver hake	52	229	32
Cod	2	45	8
Haddock	3	9	2
Flatfishes	2	79	11
Squids	113	3,902	139

* preliminary figure.

B Special Research Studies

Biological Studies

Herring. Length measurements were made for the fish caught in January and in June. Wintering fish in the depth of 77 meters had mean fork length of 21.3 cm with the range from 14 cm to 27 cm and fish of early summer in 250 meters depth had the mean length of 31.0 cm, from 24 cm to 36 cm.

Butterfish. 682 individuals from the depth of 140-200 meters on Georges Bank in February were measured. Mean fork length of 18.01 cm in 5Ze was slightly larger than that of 17.64 cm in 5Zw. And the fish caught in the depth of 250 meters in 5Ze in November were composed of small fish whose mean length was in 16.29 cm.

Squids. From ^{5Ze} in February 700 individuals were measured. And from January to February from 5Zw 498 individuals were measured. The compositions of mantle length from these samples are shown in Fig. 3. In February it seems that 5Zw was more abundant in large squids compared with 5Ze.

SPRING

AUTUMN

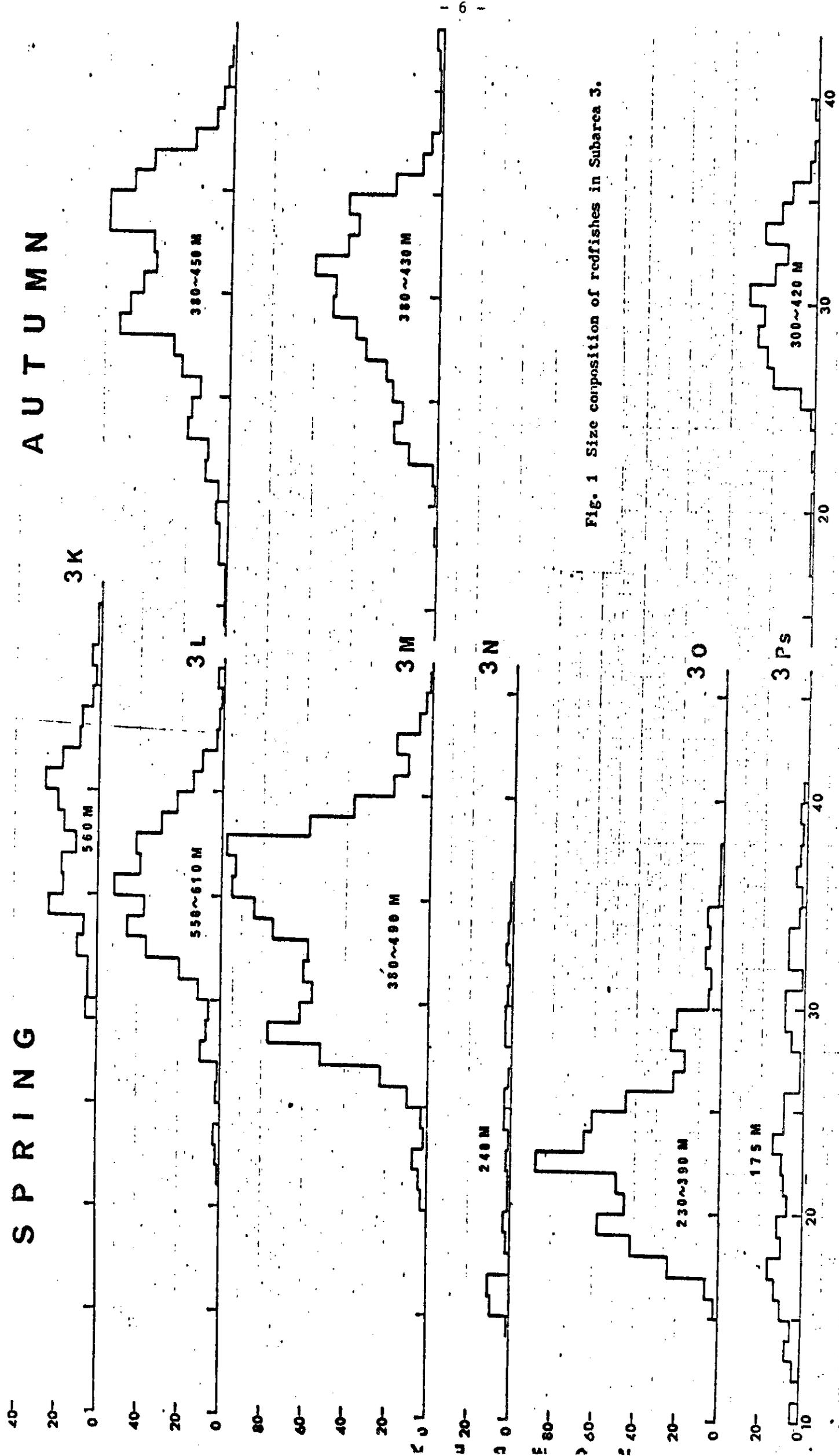
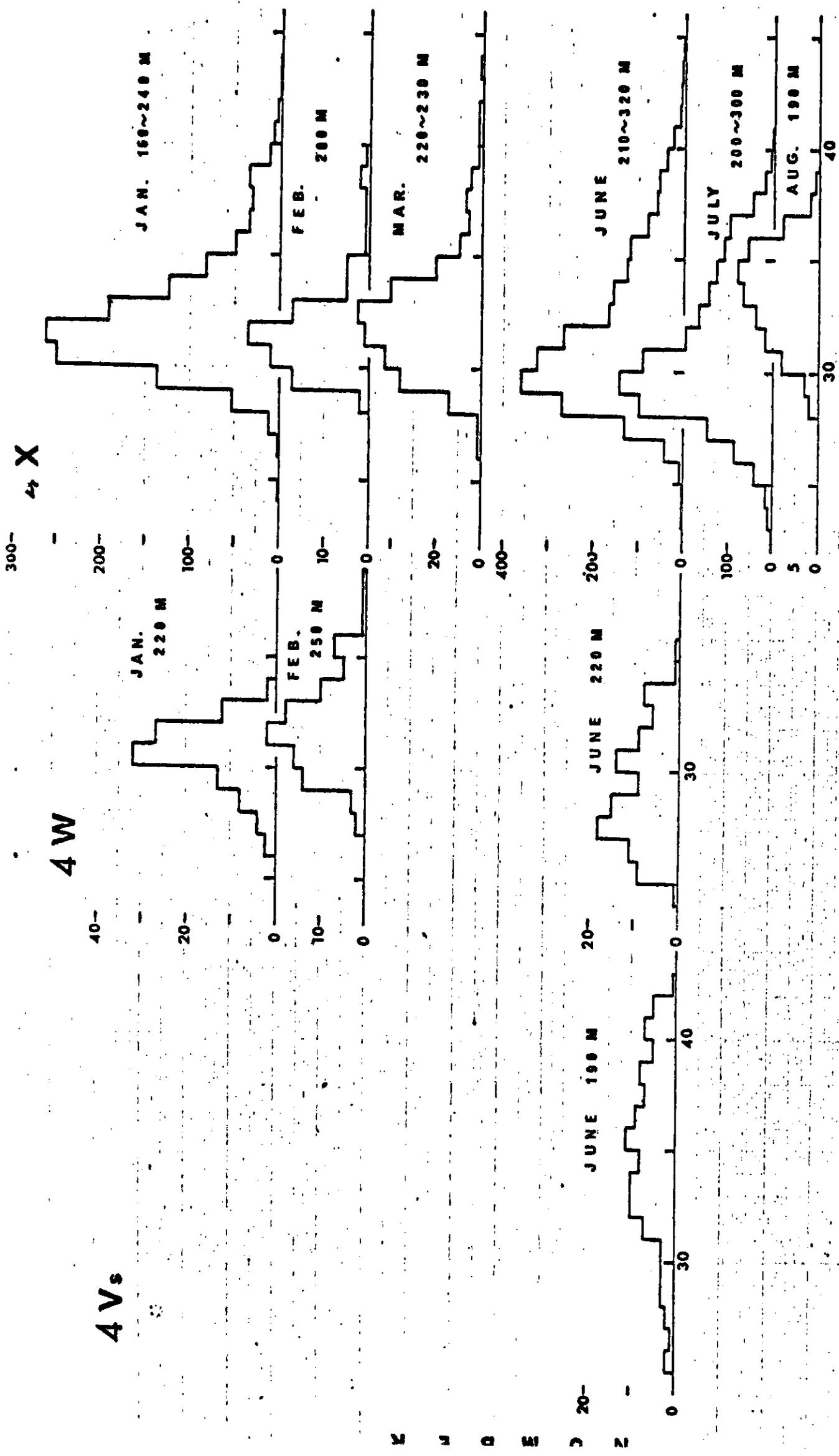


Fig. 1 Size composition of redfishes in Subarea 3.

F O R K L E N G T H (C M) F I G . 1



F O R K L E N G T H (C M)

Fig. 2. Size composition of Argentine by divisions and by months.

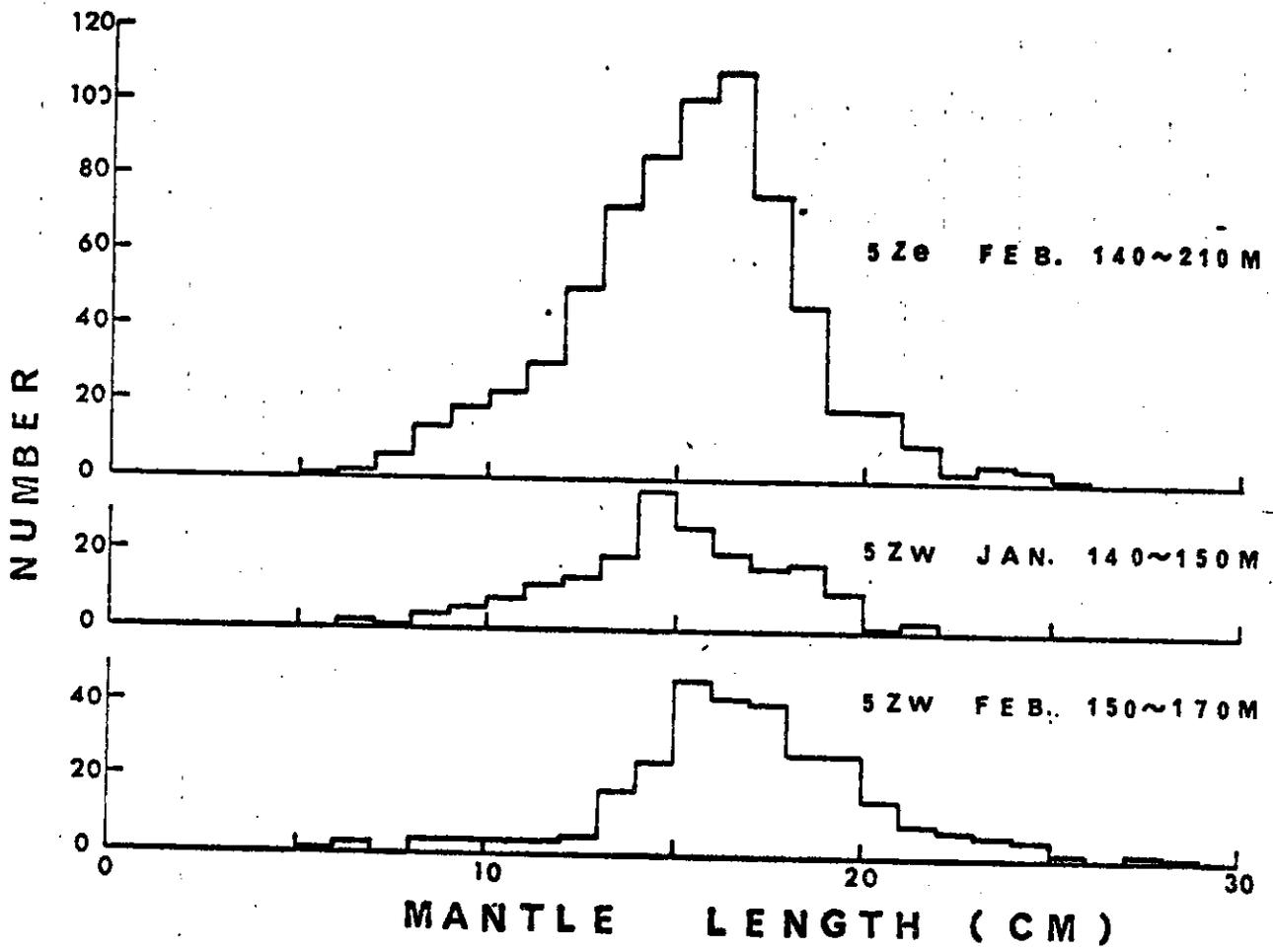


Fig. 3. Size composition of squids in Div.5Z.