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Outline of Japanese Squid Fishery in Subareas 3 and 4 in 1979

by

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As the national quota for 1979, Japan was allocated 4,500 tons of Illex catch from Subareas 3 and 4, together with the special quota of 100 tons for the Joint Canada-Japan Research Survey. In addition, a part of the Canadian quota, amounting to 18,135 and 7,500 tons of Illex were permitted to Japanese trawlers and squid jigging vessels, respectively. Consequently, the allowable Japanese catch of Illex from Subareas 3 and 4 amounted to 30,235 tons in 1979.

General view of fishing operation

The Japanese squid fishery in Subareas 3 and 4 in 1979 started in July and continued to December. The number of vessels licensed and actually operated are shown in Table 1.

Eighteen Japanese trawlers operated on and along the continental edges and slopes extending over the Grand Bank and Scotian Shelf (Div. 3N, O and 4Vs, W, X), up to around 300 m in depth. Most of them used two types of gear, i.e., bottom and off-bottom trawl gears. Off-bottom gears were used mainly in the east of 60°W and bottom gears only in the west of 60°W in accordance with the regulation by Canadian Government. The mesh of cod-end ranged from 60 mm to 80 mm, irrespective of gear type and vessel size.

On the other hand, seven squid jigging vessels operated all over the Scotian Shelf and on some parts of the Grand Bank (Div. 3L, O and 4V, W, X). Twenty four to twenty eight of automatic jigging machines were equipped in smaller vessels (100 GRT class) and 26 to 36 in larger ones (400 GRT class).

Squid catch and effort expended, fishing season and grounds covered

Japanese catch and effort statistics on squid from Subareas 3 and 4 in 1979 fishing season are shown in Table 2. The total Illex catch by squid fishery amounted to 30,213 tons, and 497 tons of squid were taken as by-catch of the argentine fishery. Total Illex catch by all Japanese vessels attained 30,710 tons which was slightly over the quota allocated to Japan for 1979.

Squid catch per day by trawlers for the whole 1979 fishing season was 8 tons under Japanese quota, but 32 tons under Canadian quota. The catch per day by jigging vessels was 12 tons. This low value of catch per day for Japanese quota was probably due to a tactics that fishermen intended to make better products in quality rather than in quantity in order to gain greater income from their limited quota.

Fishing season extended over five months, from July to November, with a peak in September to October. The largest catch, 11,790 tons of short-finned squid, was made in September when 516 days were expended, and 9,299 tons were caught in October when 494 days were expended. Squid catch in these two months attained 70 % of Japan's total squid catch.

Japanese fishing efforts by trawlers were concentrated into Div. 4Vs and W, and squid catch in these two divisions amounted to 22,286 tons which accounted for 96 % of total squid catch by trawlers. While, fishing efforts by squid jigging vessel were widely distributed and none of the divisions occupied more than 28 % of squid catch by jigging vessels.

More detailed localities of fishing effort and squid catch by trawlers are shown in Fig. 1 and 2, respectively. These figures are drawn by using provisional haul-by-haul catch and effort data which covered around 90 % of total operations including the direct fishery for argentine. Also, fishing grounds for jigging vessels are shown in Fig. 3.

According to these figures, Japanese trawlers, in early fishing season, operated widely on the southern edge of the Scotian Shelf and on the southwestern edge of the Grand Bank. They, then, concentrated in and around of The Gully located on the border between Div. 4Vs and W in the mid season, and more than 85 % of Illex catch was obtained from here (area between 58°W and 60°W) in September and October. Another concentration of fishing effort for argentine was found in Div. 4X in October. In the late season, Japanese trawlers operated mainly in Div. 4V.

On the other hand, squid jigging vessels operated widely over the Scotian Shelf and occasionally on the Grand Bank (Fig. 3), and each of the catch from Div. 4Vn, 4Vs and 4W were nearly equal.

The CPUEs of Illex by month and by division, calculated from the figures from Japanese trawlers under Canadian quota, are shown in Table 3, irrespective of vessel size and gear type. The highest CPUEs in terms of catch per day operated and catch per hour fished were obtained in September or in October for each division. The values of CPUE in 1979 were considerably higher than those in 1978. Namely, monthly catch per day, irrespective of division, were 1.1 to 1.6 times (1.3 on average) and catch per hour were 1.6 to 2.7 times (1.9 on average) of the previous year. However, the values of catch per day in 1979 were just on the upper limit of freezing capacity of vessel, therefore, the abundance of Illex could not be represented fully in these values. Taking into account the values of catch per hour, it is suggested that the squid abundance in 1979 was considerably higher than that in 1978 fishing season.

By-catch

The catch of other species in direct squid fishery by Japanese trawlers in 1979 are shown in Table 4. Around 1,076 tons of by-catch, mainly composed of argentine (77 %) and silver hake (20 %), were caught in Subareas 3 and 4. Most of them were obtained from Div. 4Vs and W where Japanese fishing efforts were concentrated.

On the other hand, no by-catch was made by jigging fishery.

Table 1. The number of Japanese vessels operated in 1979 fishing season in Subarea^s 3 and 4.

Type of vessel	Tonnage class (GRT)	Number of licensed vessels	Number of vessels operated*					
			Jul	Aug	Sep	Oct	Nov	Dec
Trawler	1,000 (991-1,000)	5	2	2	5	5	3	-
	1,500 (1,246-1,499)	5	2	4	5	5	5	-
	2,000 (2,155-2,202)	2	-	-	2	2	2	-
	2,500 (2,501-2,538)	6	5	6	6	6	6	-
	Subtotal	18	9	12	18	18	16	-
Jigging vessel	100 (99-100)	4	3	3	4	4	4	-
	400 (351-498)	3	-	2	3	3	3	1
	Subtotal	7	3	5	7	7	7	1
Total		25	12	17	25	25	23	1

* Some trawlers switched occasionally to the argentine fishery.

Table 2. Illex catch and effort expended by Japanese squid fishery in Subarea 3 and 4 in 1979. The catch and effort by argentine fishery were excluded.

Within Japanese quota (4,600 tons) *							
Month	Jul	Aug	Sep	Oct	Nov	Dec	Total
Days fished	74	66	84	166	112	-	502
Hours fished	708	509	562	1223	997	-	3999
3N	-	-	-	-	14	-	14
3O	232	7	137	-	39	-	415
4Vs	-	-	562	528	40	-	1130
4W	395	485	187	639	615	-	2321
4X	112	-	-	-	67	-	179
3 + 4	739	492	886	1167	775	-	4059
Within Canadian quota (18,135 tons by trawlers)							
Days fished	23	95	265	177	31	-	591
Hours fished	157	922	2519	1941	422	-	5961
3O	-	156	153	-	-	-	309
4Vs	-	150	5585	1958	-	-	7693
4W	382	2233	3257	4283	987	-	11142
4X	-	21	5	-	-	-	26
3 + 4	382	2560	9000	6241	987	-	19170
Within Canadian quota (7,500 tons by squid jigging vessels)							
Days fished	51	105	167	151	105	4	583
3L	-	-	-	73	-	-	73
3O	-	-	217	280	15	-	512
4Vn	105	238	722	357	530	-	1952
4Vs	29	388	522	350	592	35	1916
4W	193	418	282	455	271	-	1619
4X	136	239	161	376	-	-	912
3 + 4	463	1283	1904	1891	1408	35	6984
Total (30,235 tons)							
Month	Jul	Aug	Sep	Oct	Nov	Dec	Total
Days fished	148	266	516	494	248	4	1676
3L	-	-	-	73	-	-	73
3N	-	-	-	-	14	-	14
3O	232	163	507	280	54	-	1236
4Vn	105	238	722	357	530	-	1952
4Vs	29	538	6669	2836	632	35	10739
4W	970	3136	3726	5377	1873	-	15082
4X	248	260	166	376	67	-	1117
3 + 4	1584	4335	11790	9299	3170	35	30213

* including 100 tons for Joint Canada-Japan Research Cruise.

Table 3. Illex CPUE of Japanese trawlers for 1978 and 1979 fishing seasons,
Based on the catch and effort data within the limit of Canadian
quota, irrespective of vessel size and gear type.

Month	Div.	1978			1979		
		Catch in tons	CPUE in tons /day /hour		Catch in tons	CPUE in tons /day /hour	
Jul	4Vs	128	128.0	6.4	-	-	-
	4W	Ø	0.0	0.0	382	16.6	2.4
	3+4	128	12.8	0.9	382	16.6	2.4
Aug	30	799	29.6	2.2	156	26.0	2.4
	4Vs	558	29.4	2.0	150	37.5	6.0
	4W	1869	24.3	1.8	2233	26.6	2.7
	4X	83	9.2	0.7	21	21.0	2.3
	3+4	3309	25.1	1.8	2560	26.9	2.8
Sep	30	761	28.2	1.9	153	51.0	5.3
	4Vs	3127	30.7	2.4	5585	35.3	3.9
	4W	4675	25.8	1.8	3257	31.6	3.1
	4X	-	-	-	5	5.0	5.0
	3+4	8563	27.6	2.0	9000	34.0	3.6
Oct	4Vs	234	13.0	1.2	1958	33.2	3.0
	4W	9051	26.5	1.9	4283	36.3	3.3
	4X	184	7.7	0.6	-	-	-
	3+4	9469	24.7	1.8	6241	35.3	3.2
Nov	4Vs	34	3.8	0.3	-	-	-
	4W	1507	21.8	1.5	987	31.8	2.3
	4X	15	7.5	1.0	-	-	-
	3+4	1556	19.5	1.4	987	31.8	2.3

Table 4. By-catch and the percentage in total catch in direct squid fishery
by Japanese trawlers in 1979 fishing seasons.

Div.	Haddock	Pollock	Silver hake	Redfish	Argentine	Total
3N	- (-)	- (-)	- (-)	- (-)	- (-)	- (-)
30	1 (0.2)	- (-)	4 (0.5)	2 (0.3)	- (-)	7 (0.9)
4Vs	Ø (0.0)	15 (0.2)	17 (0.2)	1 (0.0)	466 (5.0)	500 (5.4)
4W	- (-)	1 (0.0)	189 (1.3)	5 (0.0)	355 (2.5)	550 (3.9)
4X	2 (0.9)	- (-)	3 (1.3)	3 (1.2)	11 (5.1)	19 (8.5)
3+4	4 (0.0)	16 (0.1)	213 (0.9)	11 (0.0)	832 (3.4)	1076 (4.4)

unit: ton

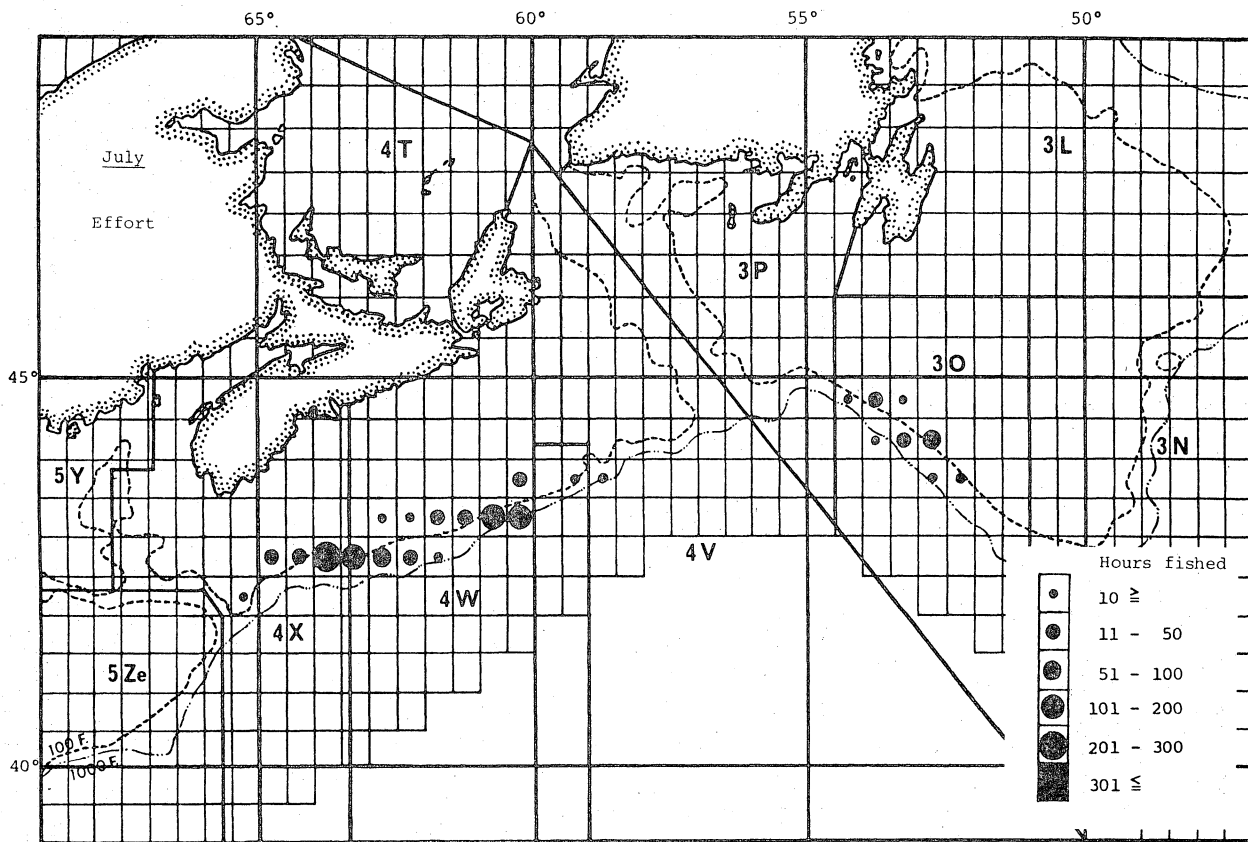


Fig. 1-1. Monthly distribution of fishing effort expended by Japanese trawlers in July 1979, including the fishing effort directed for argentine.

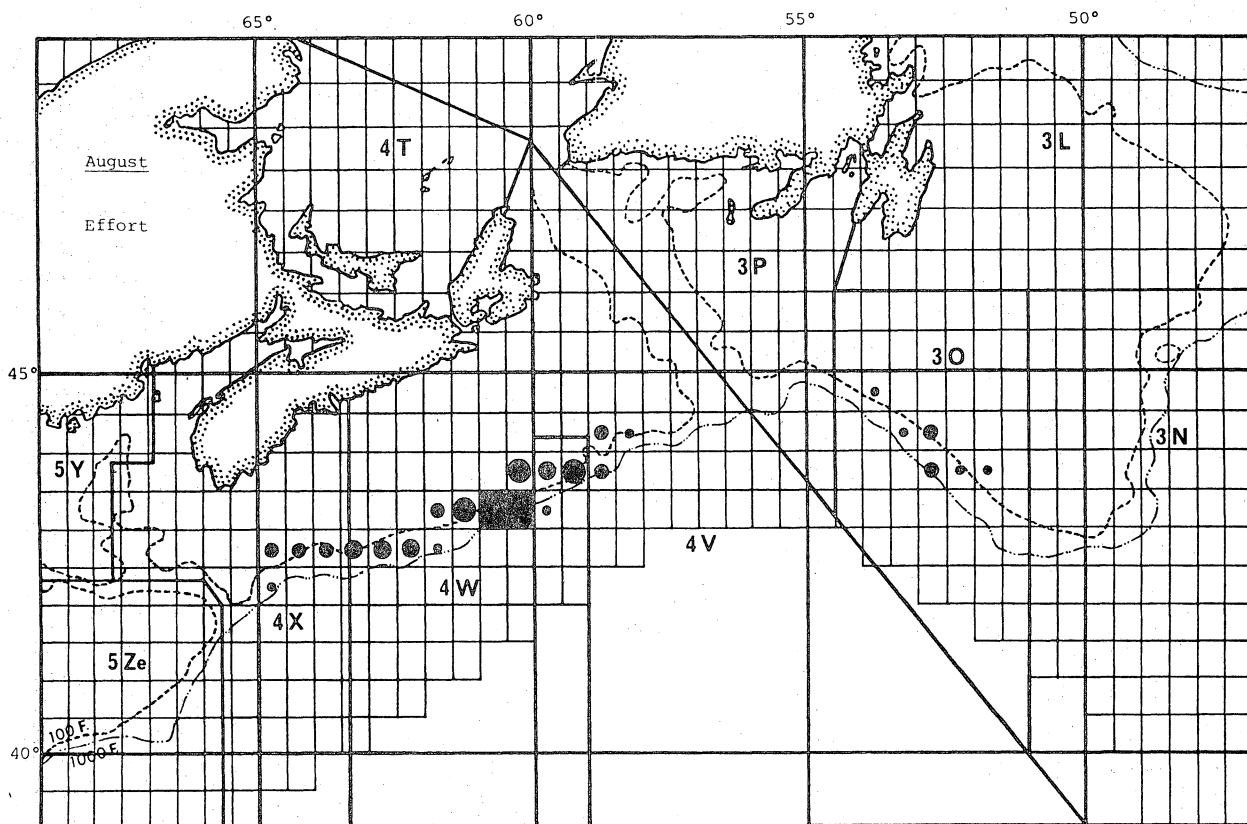


Fig. 1-2. Monthly distribution of fishing effort expended by Japanese trawlers in August 1979, including the fishing effort directed for argentine.

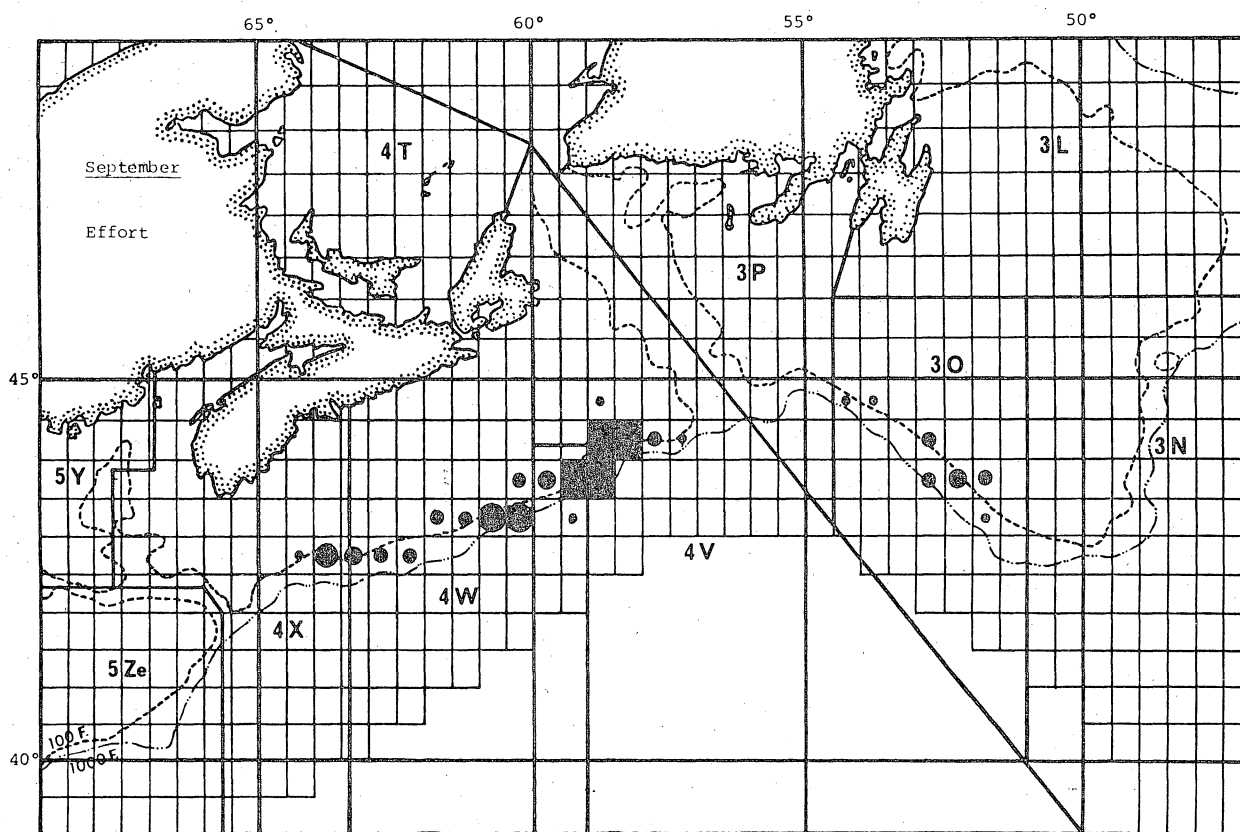


Fig. 1-3. Monthly distribution of fishing effort expended by Japanese trawlers in September 1979, including the fishing effort directed for argentine.

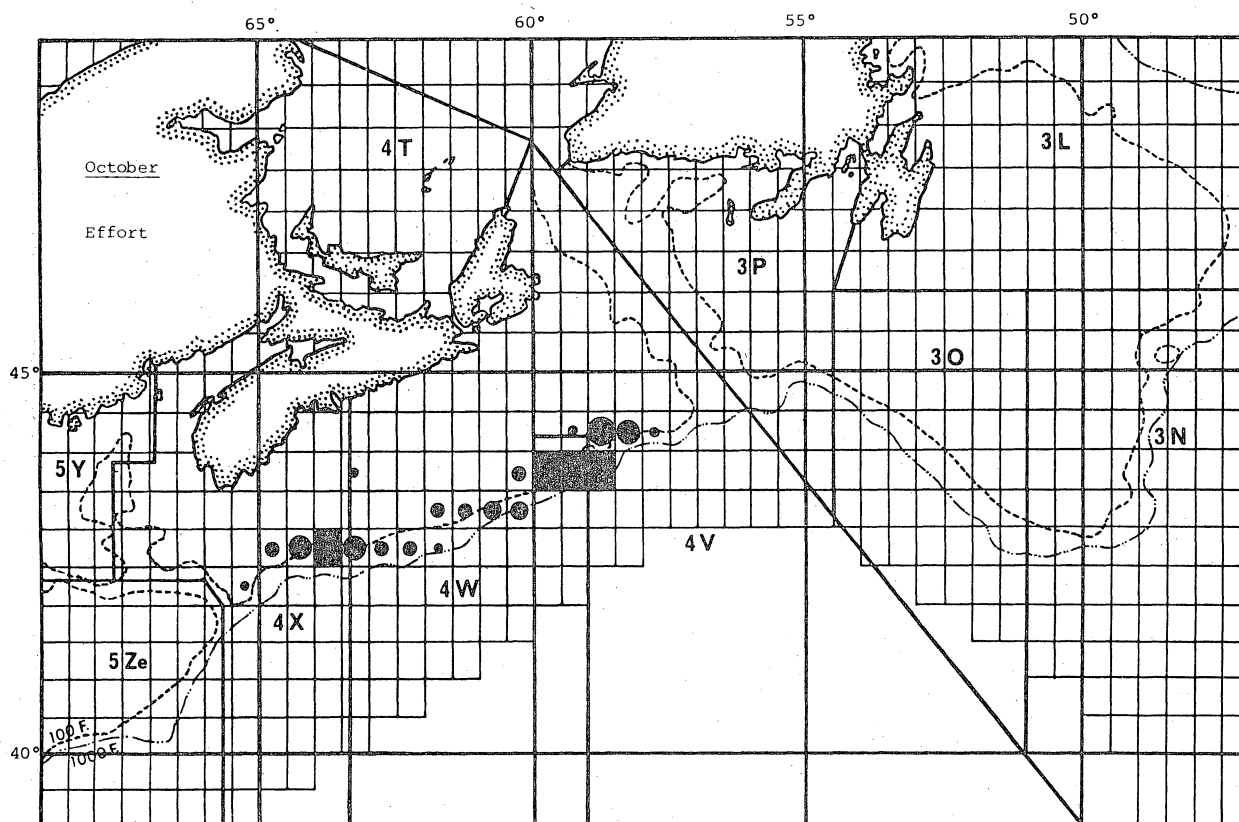


Fig. 1-4. Monthly distribution of fishing effort expended by Japanese trawlers in October 1979, including the fishing effort directed for argentine.

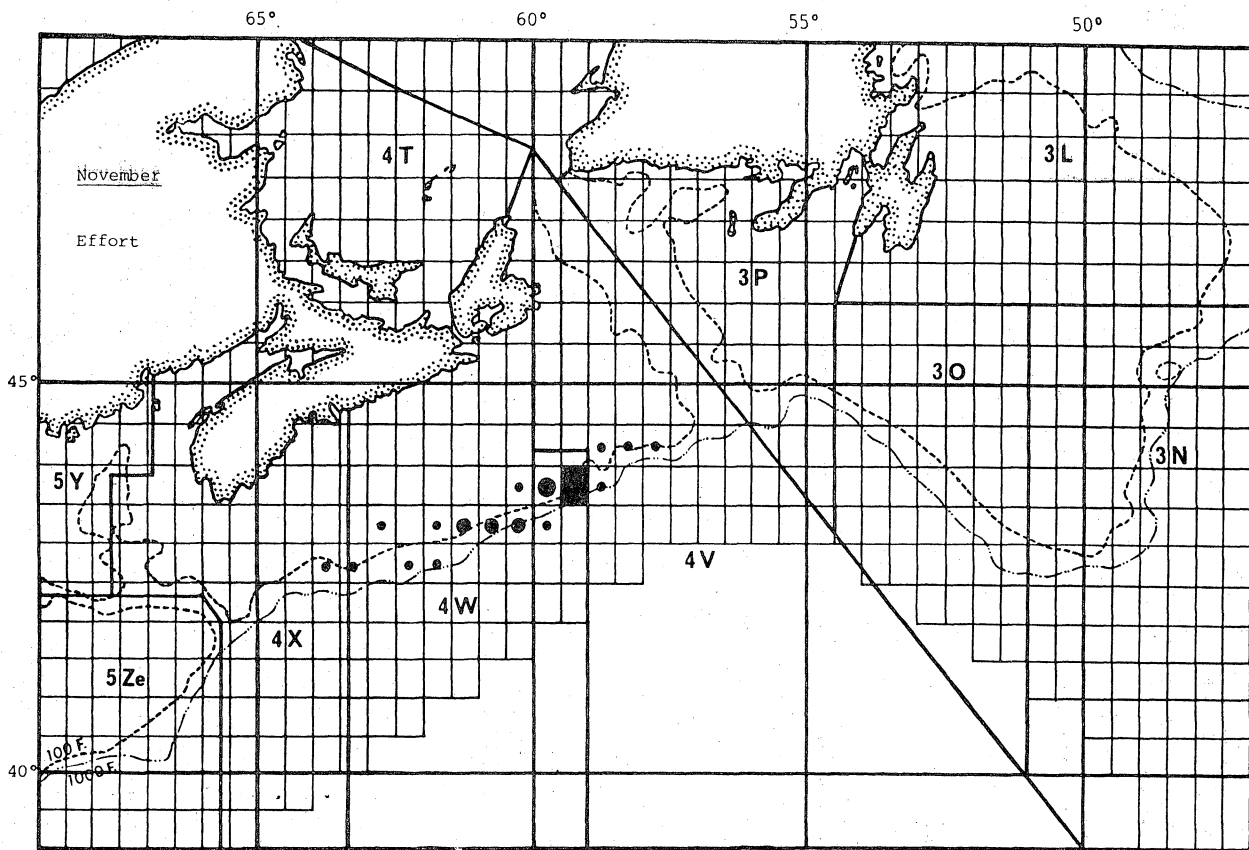


Fig. 1-5. Monthly distribution of fishing effort expended by Japanese trawlers in November 1979, including the fishing effort directed for argentine.

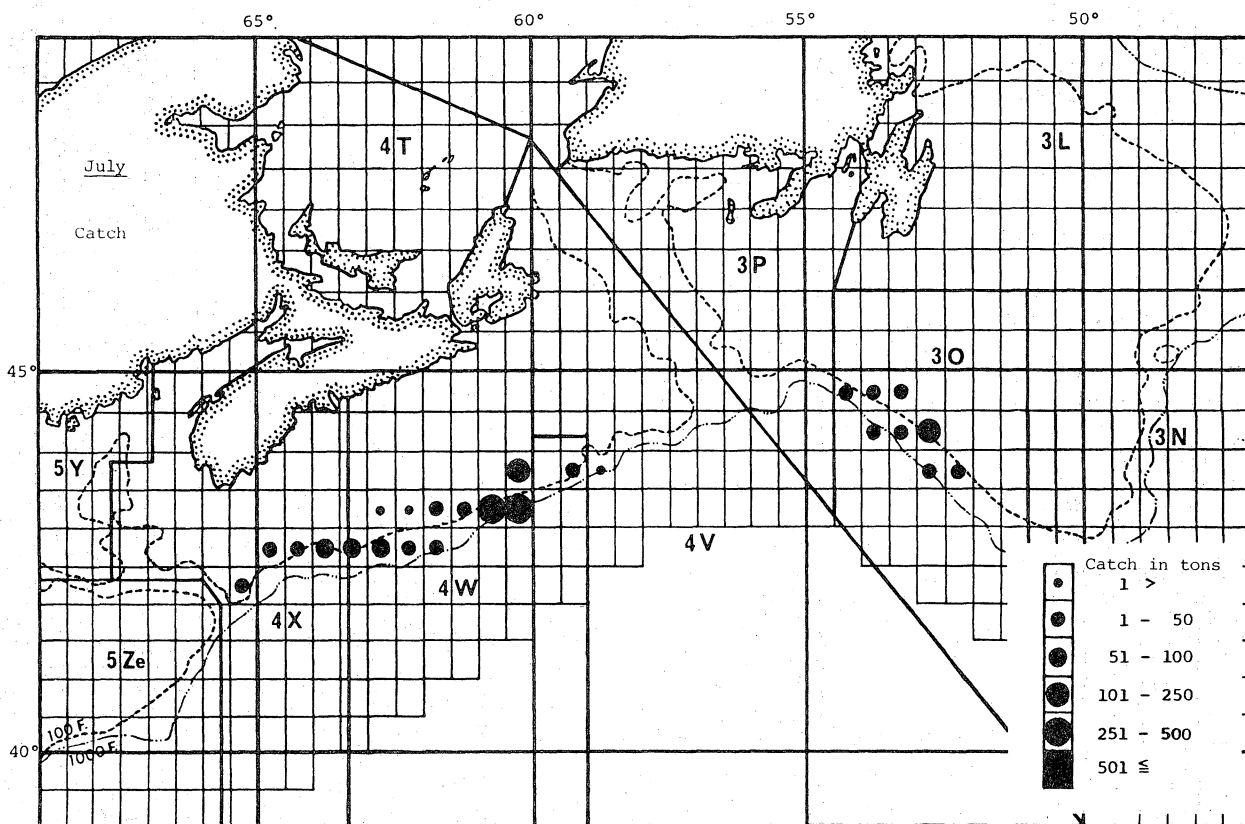


Fig. 2-1. Monthly distribution of Illex catch by Japanese trawlers in July 1979, including the catch caught by argentine fishery.

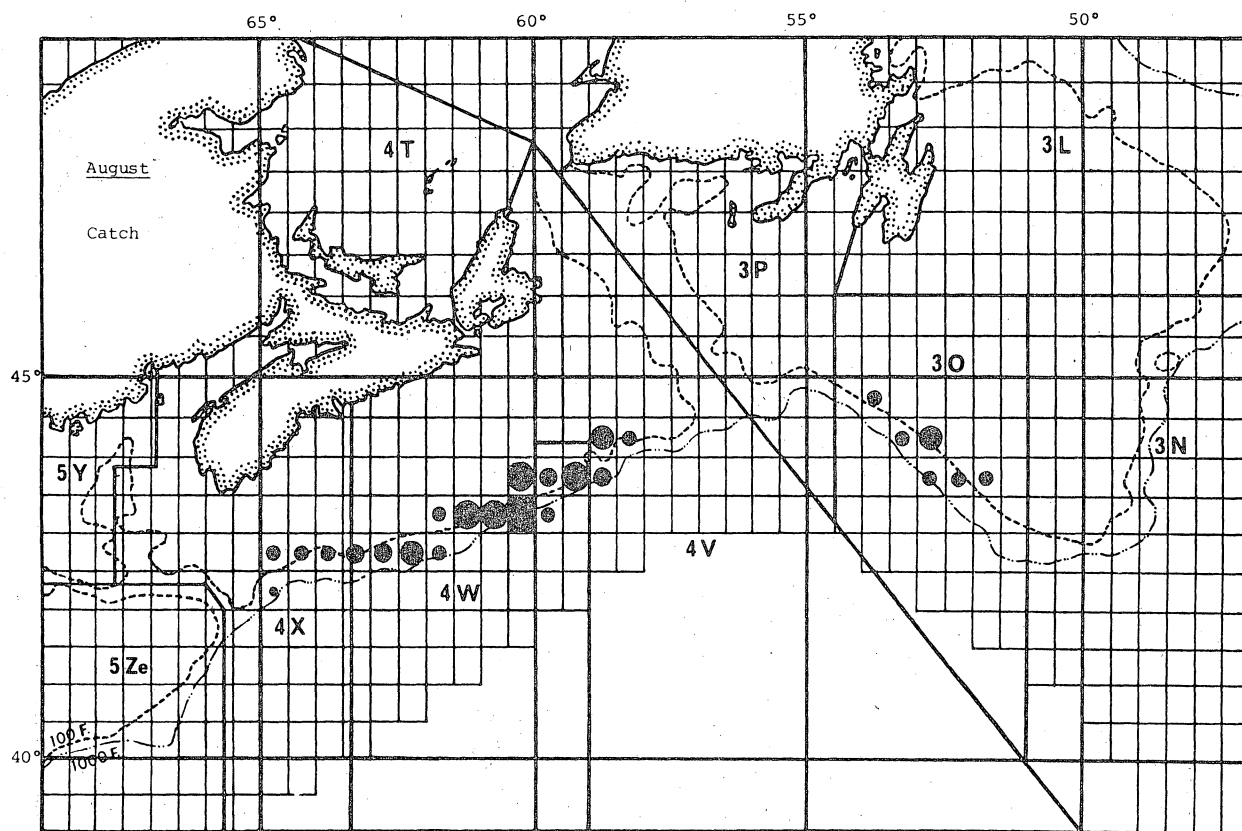


Fig. 2-2. Monthly distribution of *Illex* catch by Japanese trawlers in August 1979, including the catch caught by argentine fishery.

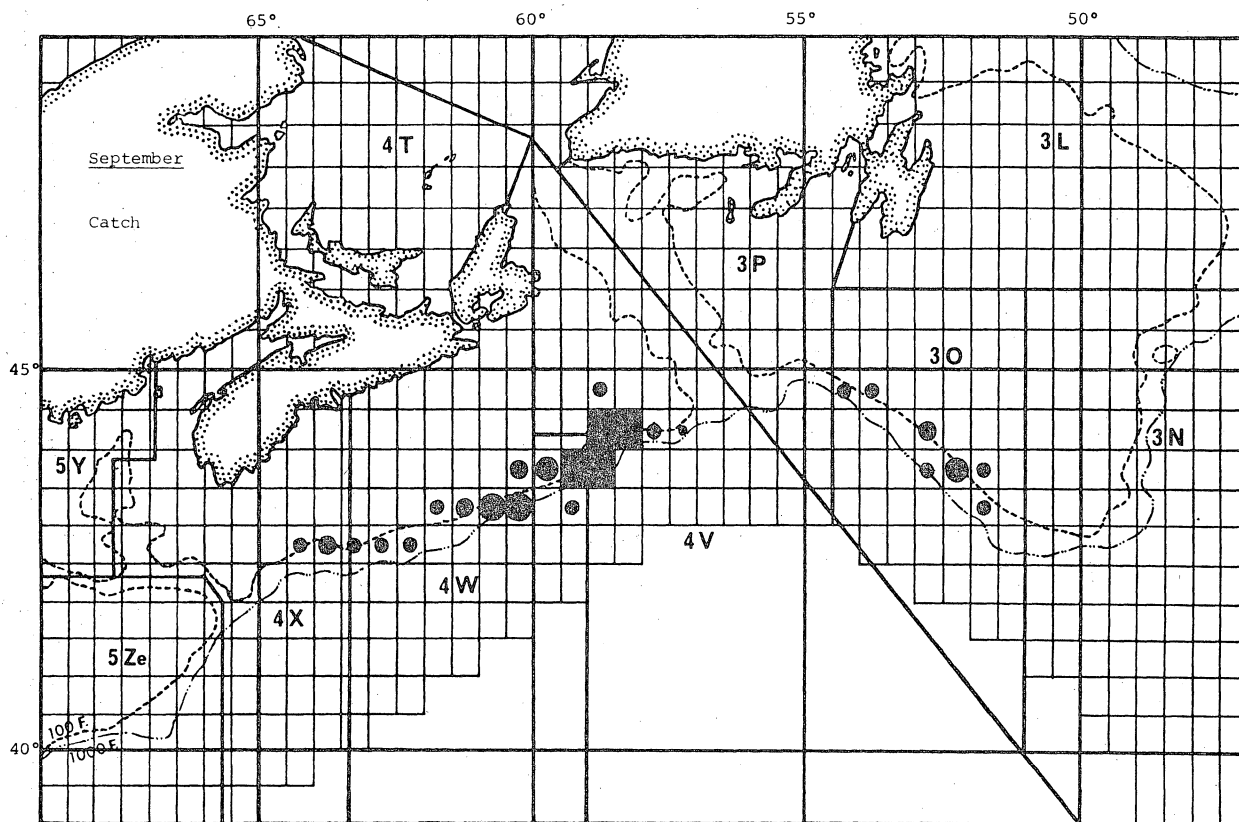


Fig. 2-3. Monthly distribution of *Illex* catch by Japanese trawlers in September 1979, including the catch caught by argentine fishery.

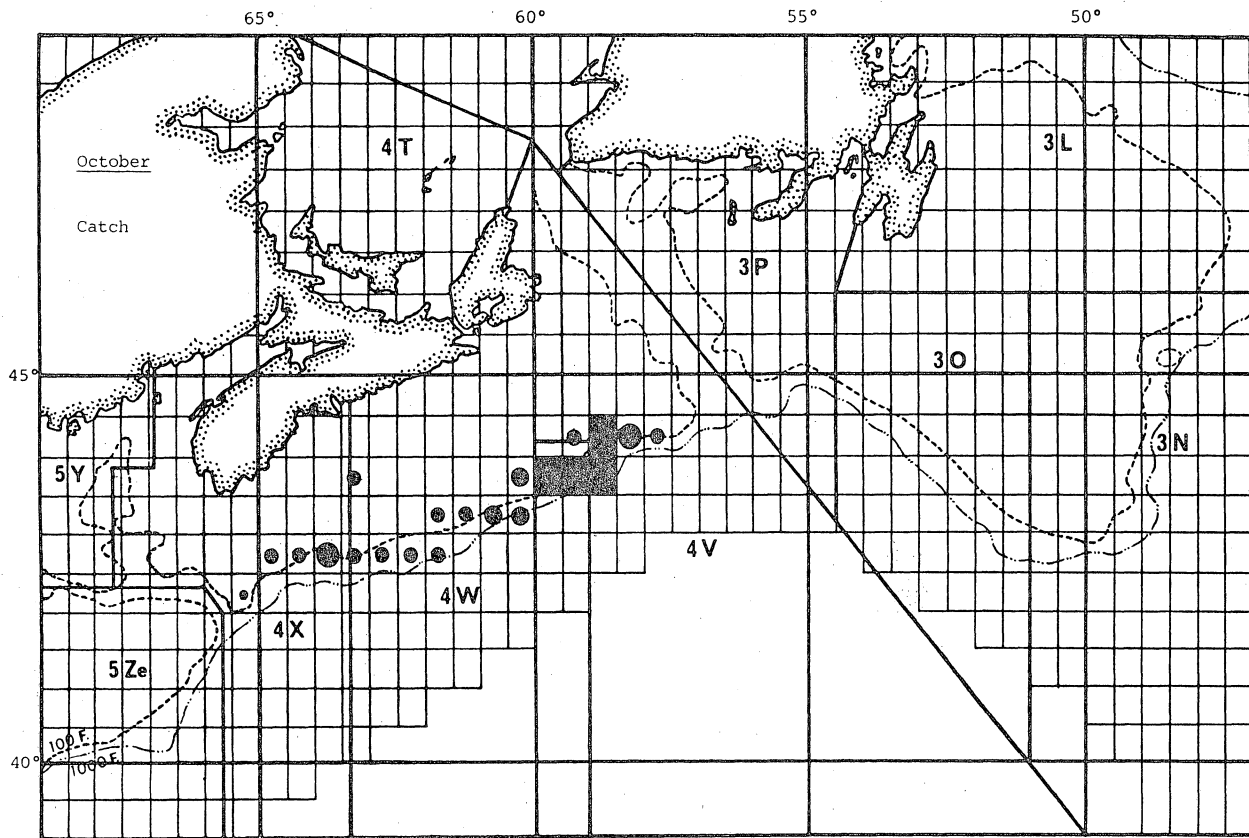


Fig. 2-4. Monthly distribution of *Illex* catch by Japanese trawlers in October 1979, including the catch caught by argentine fishery.

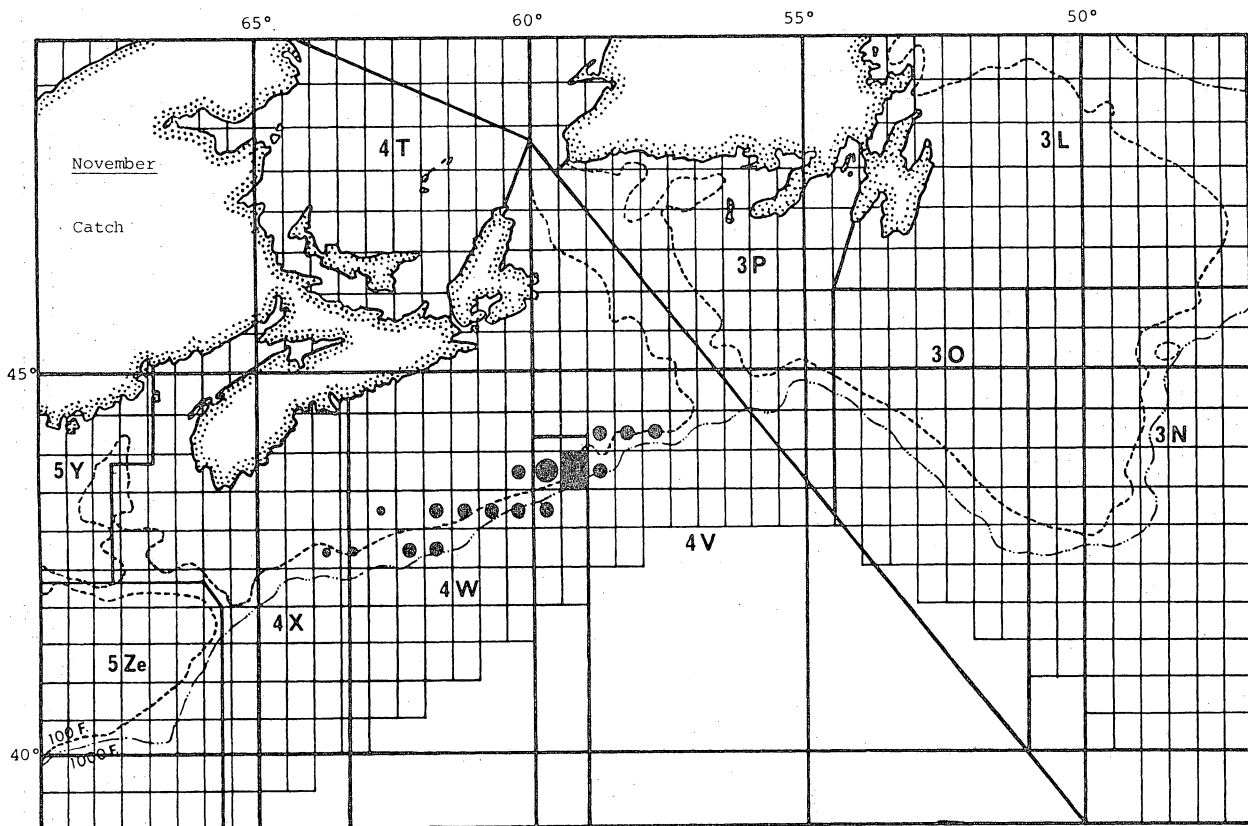


Fig. 2-5. Monthly distribution of *Illex* catch by Japanese trawlers in November 1979, including the catch caught by argentine fishery.

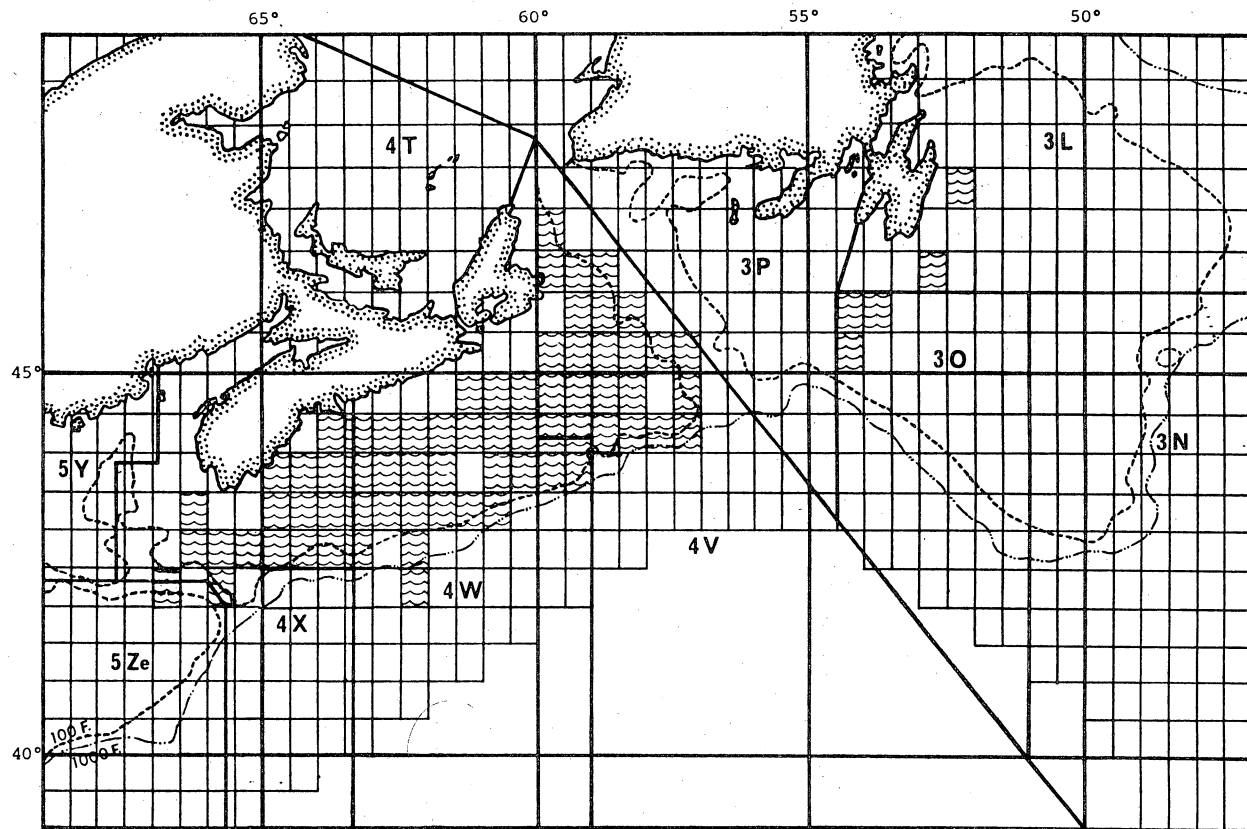


Fig. 3. Area operated by Japanese squid jigging vessels in 1979 fishing season.