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Outline of Japanes squid fishery in Subareas 3 and 4, 1978

by

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As the national quota for 1978, Japan was allocated 4,500 tons of Illex catch from Stock Area 3+4, together with the quotas of 11,300 tons of capelin and 4,030 tons of argentine. In addition, by the arrangement between Japanese and Canadian fishing industries, a part of the Canadian quota(23,250 tons) was permitted to Japanese fishing vessels for 1978. Consequently, the allowable Japanese catch of Illex from Canadian waters amounted to 27,750 tons in 1978.

The haul-by-haul catch and effort data on the squid fishery based on the aforementioned arrangement were reported to the Canadian authorities concerned. But those catch and effort statistics were also reported to the Japanese government.

General view of fishing operations

The Japanese squid fishery in Stock Area 3+4 in 1978 started at the middle of July and continued towards the middle of November with 21 middle and large-sized stern trawlers. The number of licensed vessels and vessels actually operated by size and by month are as follows,

Tonnage class (GRT)	Number of licensed vessels	Number of vessels operated				
		Jul	Aug	Sep	Oct	Nov
500 (526, 546)	2	0	0	2	2	0
1,000 (991-1,052)	8	3	4	6	8	7
1,500 (1,409-1,499)	4	1	4	4	4	3
2,000 (2,156,2,202)	2	2	2	2	2	2
2,500 (2,501-2,538)	5	4	3	5	5	5

These Japanese vessels operated mainly on and along the continental edges and slopes extending from Div.4V to Div.4X off the south coast of Nova Scotia, up to around 250 m in the depth of water. Most of the vessels

employed two different types of gear, i.e., bottom and off-bottom trawl gear, and the choice of gear depended upon such the fishing conditions as the roughness of bottom, the quantity and/or the height of squid concentration and the presence of other fish species.

The mesh size of cod-end used ranged from 45 mm to 90 mm, irrespective of gear type and vessel size. In case of squid fishery, however, the gears equiped with 45-60 mm mesh were most popular, while the bottom trawl with 90 mm cod-end mesh was usually used when the operations were switched to the direct fisheries for argentine.

Summary of squid catch, effort expended and the main fishing seasons and grounds

Japanese catch and effort statistics on the squid fishery in Subareas 3 and 4 in 1978 are shown in Table 1.. The total catch of Illex from those subareas, including the catch within the limit of Japanese quota and the catch on Development Charter within Canadian quota, amounted to 27,580 tons, 99 % of Japanese allowable catch for 1978.

Fishing seasons extended over 5 months, from July to November, with overwhelmingly high fishing efforts and squid catches in September and October. The largest catch was obtained in October when the fishing effort also highest in hours fished, which accounted for around 37 % of Japanese total catch of squid during the same seasons, and about 95 % of squid catch in October was reported from Div.4W.

More detailed localities of fishing effort expended and squid catch by month in 1978 fishing seasons are shown in Fig.1-1~5 and Fig.2-1~5, respectively. In addition, the distributions of corresponding CPUE are shown in Fig.3-1~5. These figures were drawn by using the provisional haul-by-haul catch and effort data which covered around 90 % of the total operations in the fishing grounds.

The figures on the locality of effort expended show that most of the vessels operated widely on the southern edges of Scotian Shelf in early periods of fishing seasons, and then moved to the eastward, as a whole, along the slope towards the boundary between Div.4W and Div.4V where the big concentrations of operation were found in September and October.

The seasonal change in geographical distribution of squid had a strong resemblance to that of fishing effort, and, as far as the Japanese fishery concerned, the greatest concentration of squid was observed in September on the southeastern edges of Scotian Shelf within the area surrounded by 43°N and 44°30′N latitudinal lines, and 58°30′E and 61°E longitudinal lines.

The combined catch in September and October accounted for around 72 % of the total Illex catch in 1978 fishing seasons, and 94 % of the catch in the main fishing season was obtained from Div.4W and 4V.

Monthly changes in Illex catch and effort expended by Division(4V,4W and 4X) and by depth zone, which were examined by using the provisional haul-by-haul fishing data aforementioned, are shown in Fig.4-1,2 and Fig.5-1,2, respectively. These figures represent that most of the squid catch obtained from the bottom layers within 160-250 m in depth, and that the 180-200 m depth zone in Div.4W was always the center of catch and operation in August and later months.

The CPUE of Illex by month and by Division, which were calculated from the catch on Development Charter and the effort expended by all of the vessels, irrespective of vessel size, gear type and mesh size employed, are shown in Table 2. The highest CPUE in this manner, in terms of catch per day operated and catch per hour fished, are observed in September in Div.4V at the values of 30.7 tons and 2.4 tons, respectively.

Catch of other fish species and discard

Argentine : As aforementioned, 4,030 tons of argentine quota was allocated to Japanese fishery in Subareas 3 and 4 in 1978. But Japanese vessels got no further than 1,540 tons of argentine catch, which accounted for only 38 % of the quota. This was partly because Japanese fleet had no power to spare for catching argentine besides squid, and partly because this species still be very cheap in market price.

Most of the catch was obtained from Div.4X in July, August and October by the short-term direct fisheries carried out by those vessels switched from squid fisheries temporarily. Fishing grounds located in rather shallow waters of 140-180 m in depth, and the catch from Div.4X accounted for 76 % of Japanese total catch of argentine.

By-catch species : Around 359 tons of by-catch species were harvested by the Japanese squid fishery, including silver hake, pollock, haddock, Atlantic cod, Atlantic redfish and other species, though the final catch of each species is unknown at present.

According to the provisional catch data, however, the catch of silver hake was largest, followed by pollock, accounting for 36 % and 25 % of the total by-catch, respectively.

Discard : Only 37 tons of the discard, including 30 tons of Illex, were reported by Japanese fishery. No further information on the discard by Japanese vessels is available.

Table 1. Provisional catches of Illex and efforts expended by Japanese trawl fishery in 1978.

A) Within the limit of Japanese quota (=4,500 tons).

Month	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Days fished	55	143	139	84	73	70	-	564
Hours fished	378	1,675	1,692	755	786	779	-	6,065
Catch in tons								
3 + 4	9	1,000	1,075	885	786	722	-	4,477
(%)	(0.2)	(22.3)	(24.0)	(19.8)	(17.6)	(16.1)	(-)	(100)
3N	-	-	-	3	-	-	-	3(0.1)
3O	-	23	364	135	24	-	-	547(12.2)
4V	1	4	206	401	14	46	-	673(15.0)
4W	8	935	355	342	624	660	-	2,925(65.3)
4X	-	38	149	4	123	16	-	330(7.4)

B) Within the limit of the allowable catch (=23,250 tons) on Development Charter.

Month	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Days fished	-	10	132	310	384	80	30	946
Hours fished	-	138	1,825	4,270	5,245	1,126	363	12,967
Catch in tons								
3 + 4	-	128	3,309	8,563	9,469	1,556	76	23,101
(%)	(-)	(0.6)	(14.3)	(37.1)	(41.0)	(6.7)	(0.3)	(100)
3N	-	-	-	-	-	-	-	-(-)
3O	-	-	799	761	-	-	-	1,560(6.8)
4V	-	128	558	3,127	234	34	7	4,088(17.7)
4W	-	-	1,869	4,675	9,051	1,507	20	17,122(74.1)
4X	-	-	83	-	184	15	49	331(1.4)

C) Within the limit of Japanese allowable catch (=27,750 tons).

Month	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Days fished	55	153	271	394	457	150	30	1,510
Hours fished	378	1,813	3,517	5,025	6,031	1,905	363	19,032
Catch in tons								
3 + 4	9	1,128	4,384	9,448	10,255	2,278	76	27,578
(%)	(0.0)	(4.1)	(15.9)	(34.3)	(37.2)	(8.3)	(0.3)	(100)
3N	-	-	-	3	-	-	-	3(0.0)
3O	-	23	1,163	896	24	-	-	2,107(7.6)
4V	1	132	764	3,528	248	80	7	4,761(17.3)
4W	8	935	2,224	5,017	9,675	2,167	20	20,047(72.7)
4X	-	38	232	4	307	31	49	661(2.4)

Table 2. Japanese CPUE of Illex for 1978 fishing seasons, based on the catches on Development Charter and corresponding efforts, irrespective of vessel size, gear type and mesh size employed.

Month	Division	Effort		Catch	CPUE in tons	
		Days	Hours	in tons	/Day	/Hour
Jul	3 + 4	10	138	128	12.8	0.9
	3N	-	-	-	-	-
	3O	-	-	-	-	-
	4V	1	20	128	128.0	6.4
	4W	9	118	-	-	-
	4X	-	-	-	-	-
Aug	3 + 4	132	1,825	3,309	25.1	1.8
	3N	-	-	-	-	-
	3O	27	363	799	29.6	2.2
	4V	19	276	558	29.4	2.0
	4W	77	1,062	1,869	24.3	1.8
	4X	9	124	83	9.2	0.7
Sep	3 + 4	310	4,270	8,563	27.6	2.0
	3N	-	-	-	-	-
	3O	27	392	761	28.2	1.9
	4V	102	1,317	3,127	30.7	2.4
	4W	181	2,561	4,675	25.8	1.8
	4X	-	-	-	-	-
Oct	3 + 4	384	5,245	9,469	24.7	1.8
	3N	-	-	-	-	-
	3O	-	-	-	-	-
	4V	18	191	234	13.0	1.2
	4W	342	4,757	9,051	26.5	1.9
	4X	24	297	184	7.7	0.6
Nov	3 + 4	80	1,126	1,556	19.5	1.4
	3N	-	-	-	-	-
	3O	-	-	-	-	-
	4V	9	129	34	3.8	0.3
	4W	69	983	1,507	21.8	1.5
	4X	2	15	15	7.5	1.0
Total (Jul-Nov)	3 + 4	916	12,603	23,025	25.1	1.8
	3N	-	-	-	-	-
	3O	54	754	1,560	28.9	2.1
	4V	149	1,932	4,081	27.4	2.1
	4W	678	9,480	17,102	25.2	1.8
	4X	35	436	282	8.1	0.6

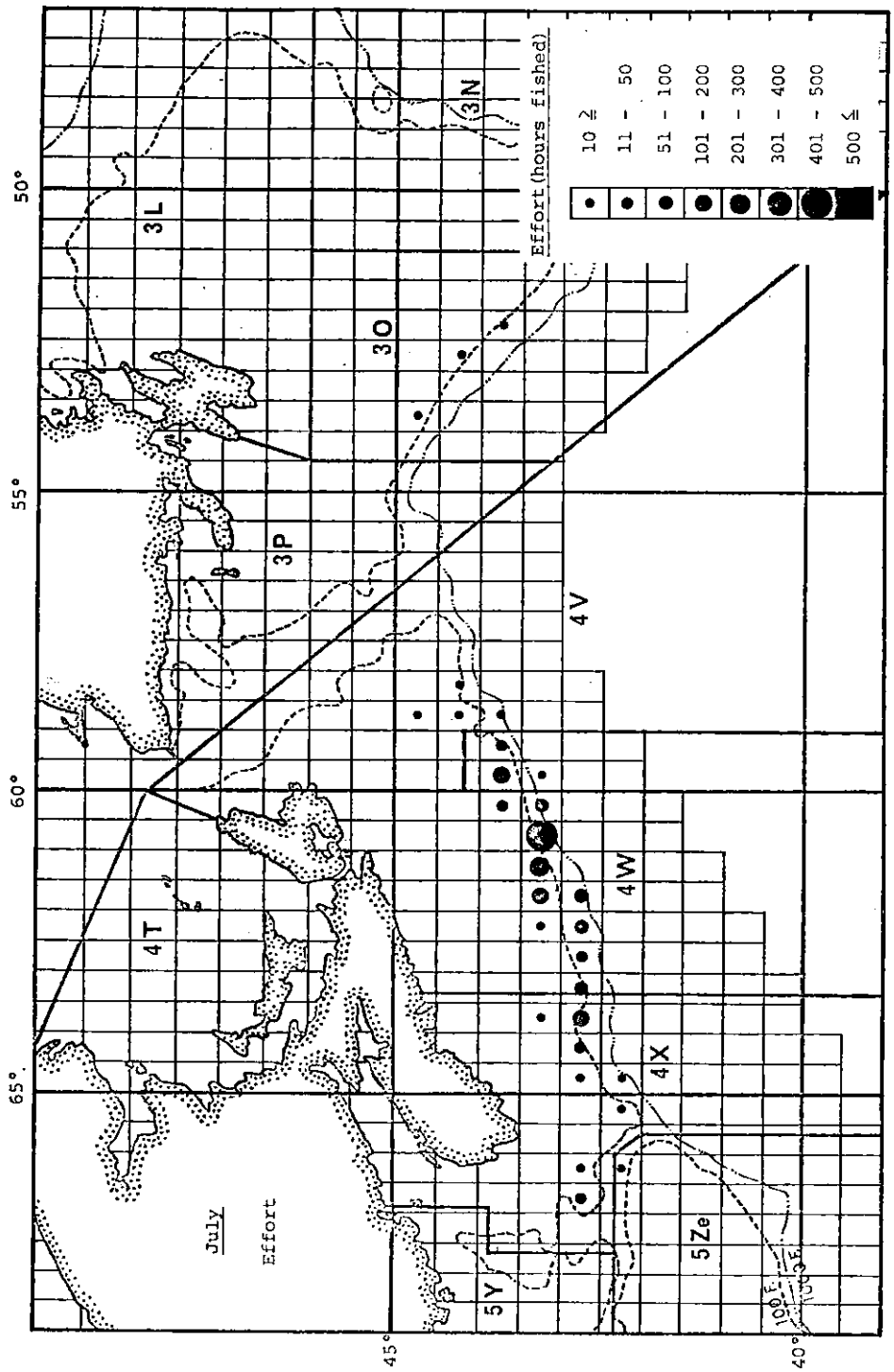

Fig. 1-1. Monthly changes in the locality of fishing effort expended by Japanese trawlers in 1978 fishing seasons: July.

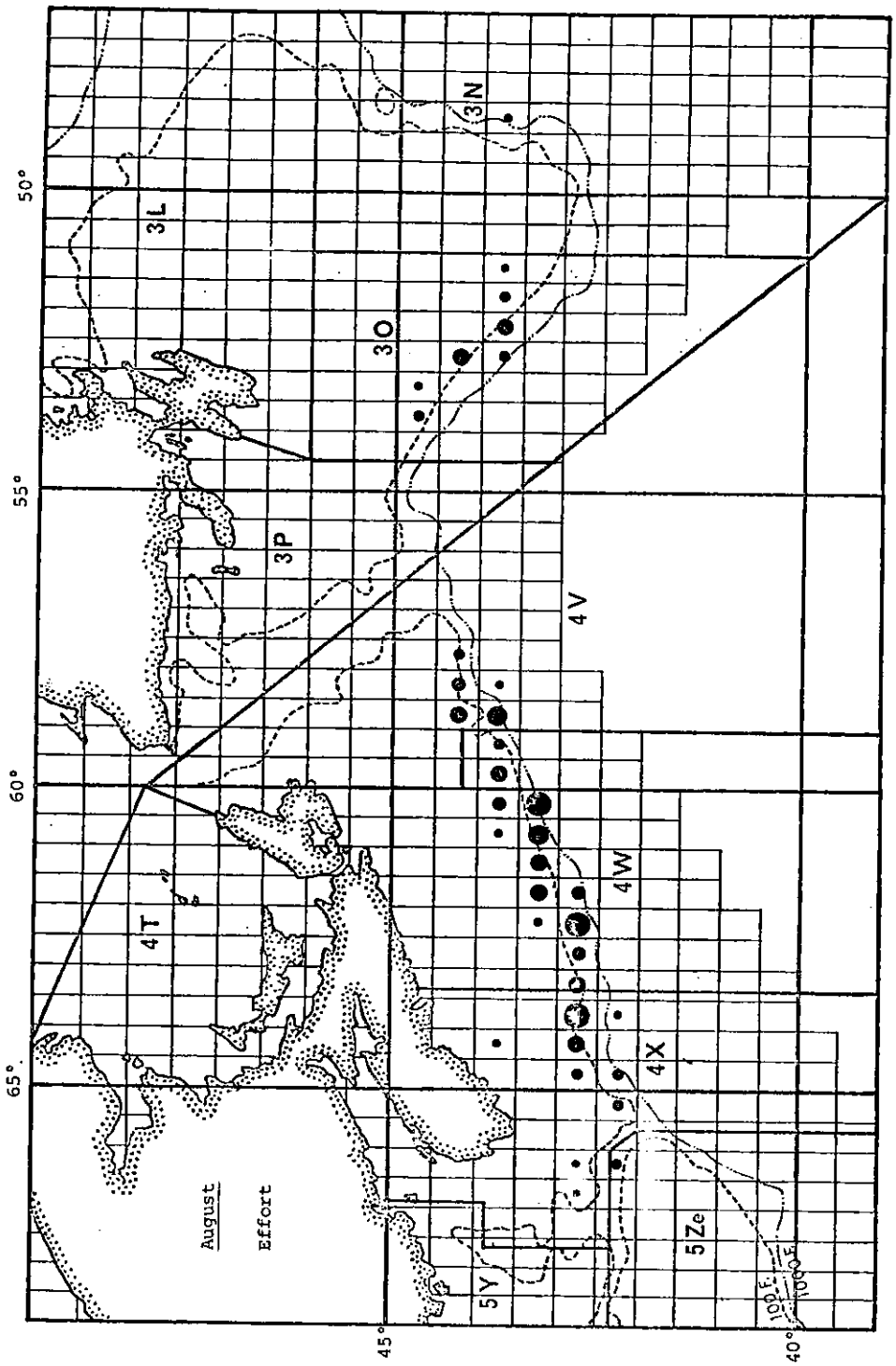

Fig. 1-2. August.

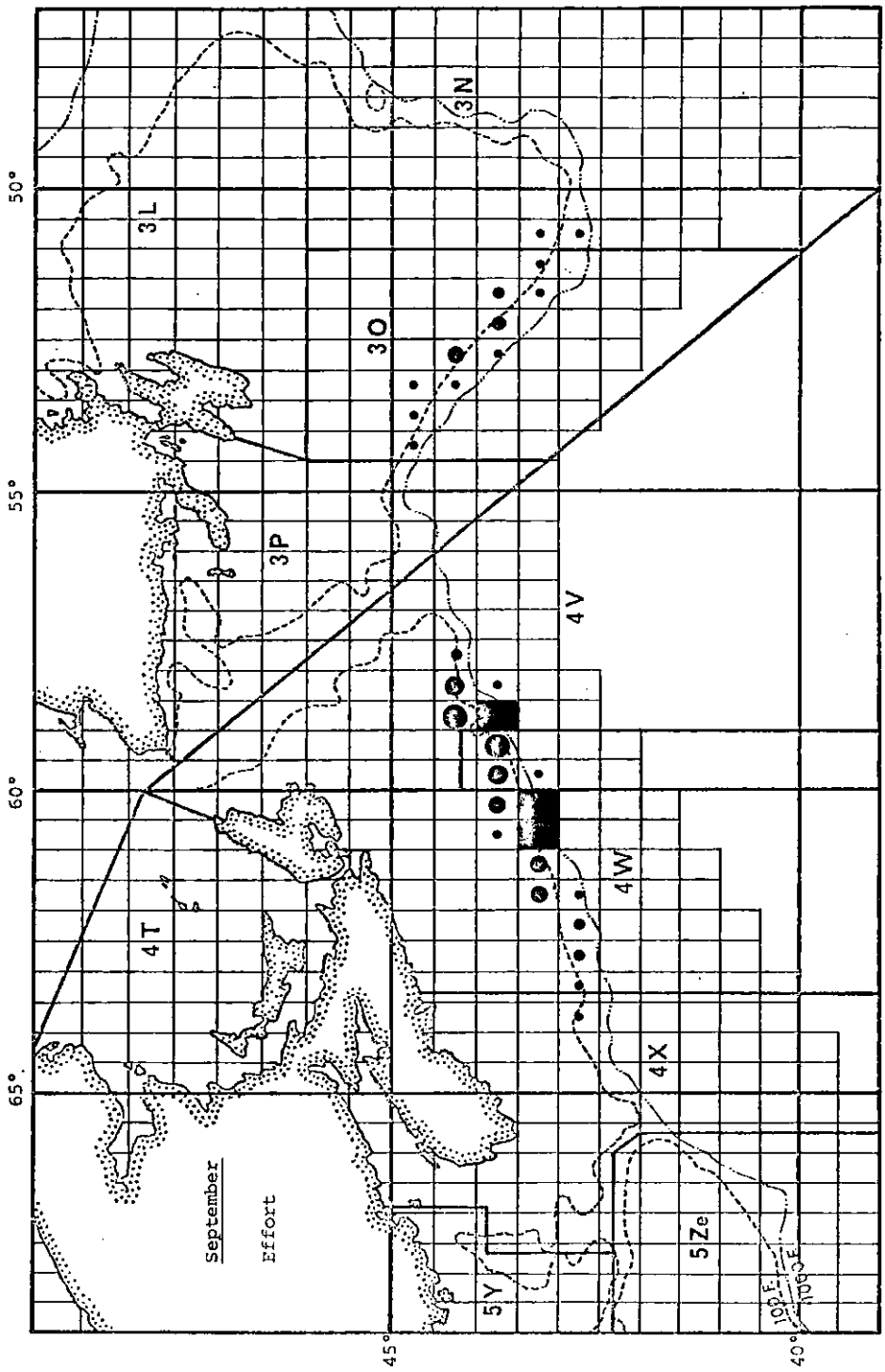

Fig. 1-3. September.

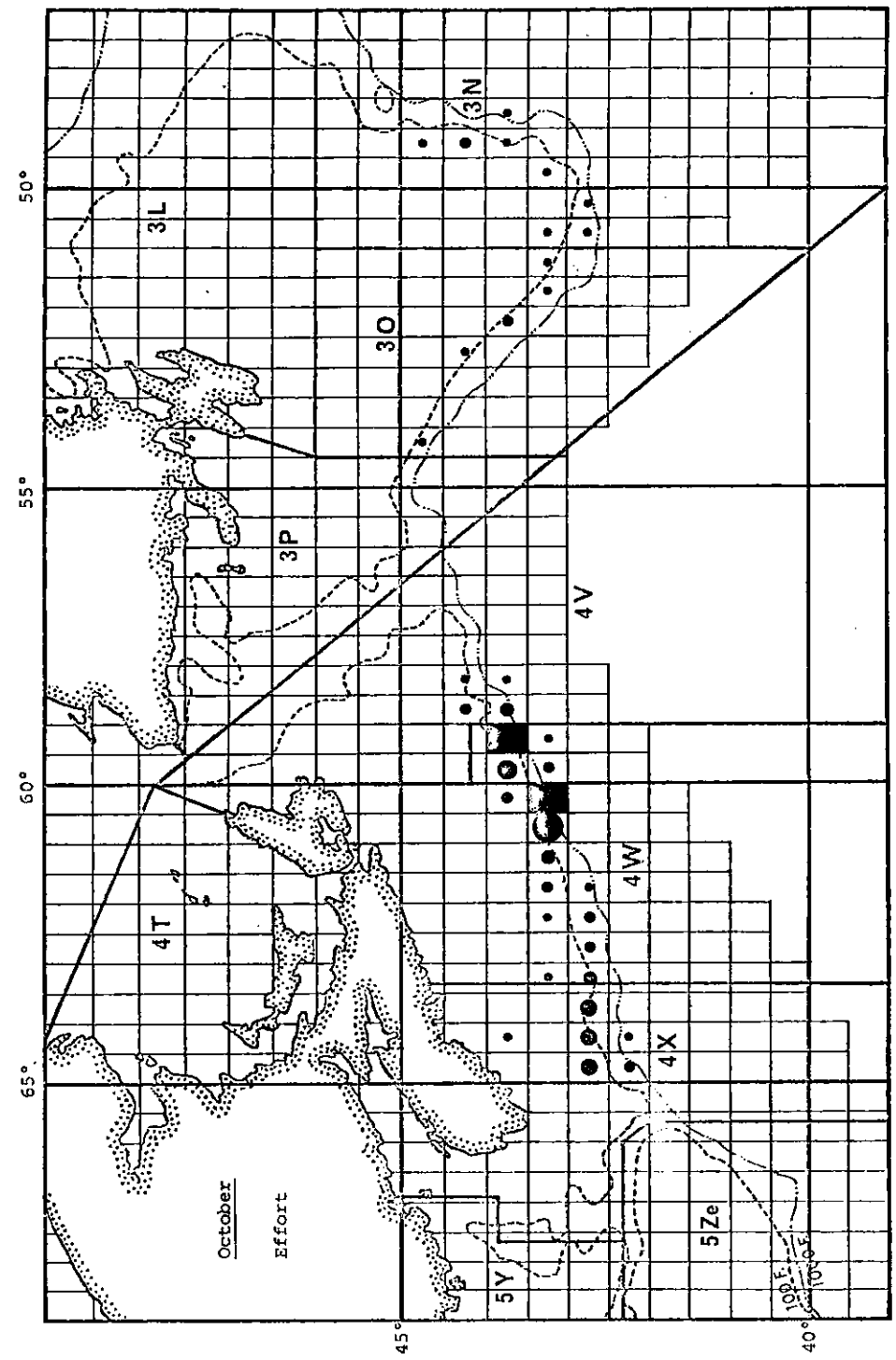

Fig. 1-4. October.

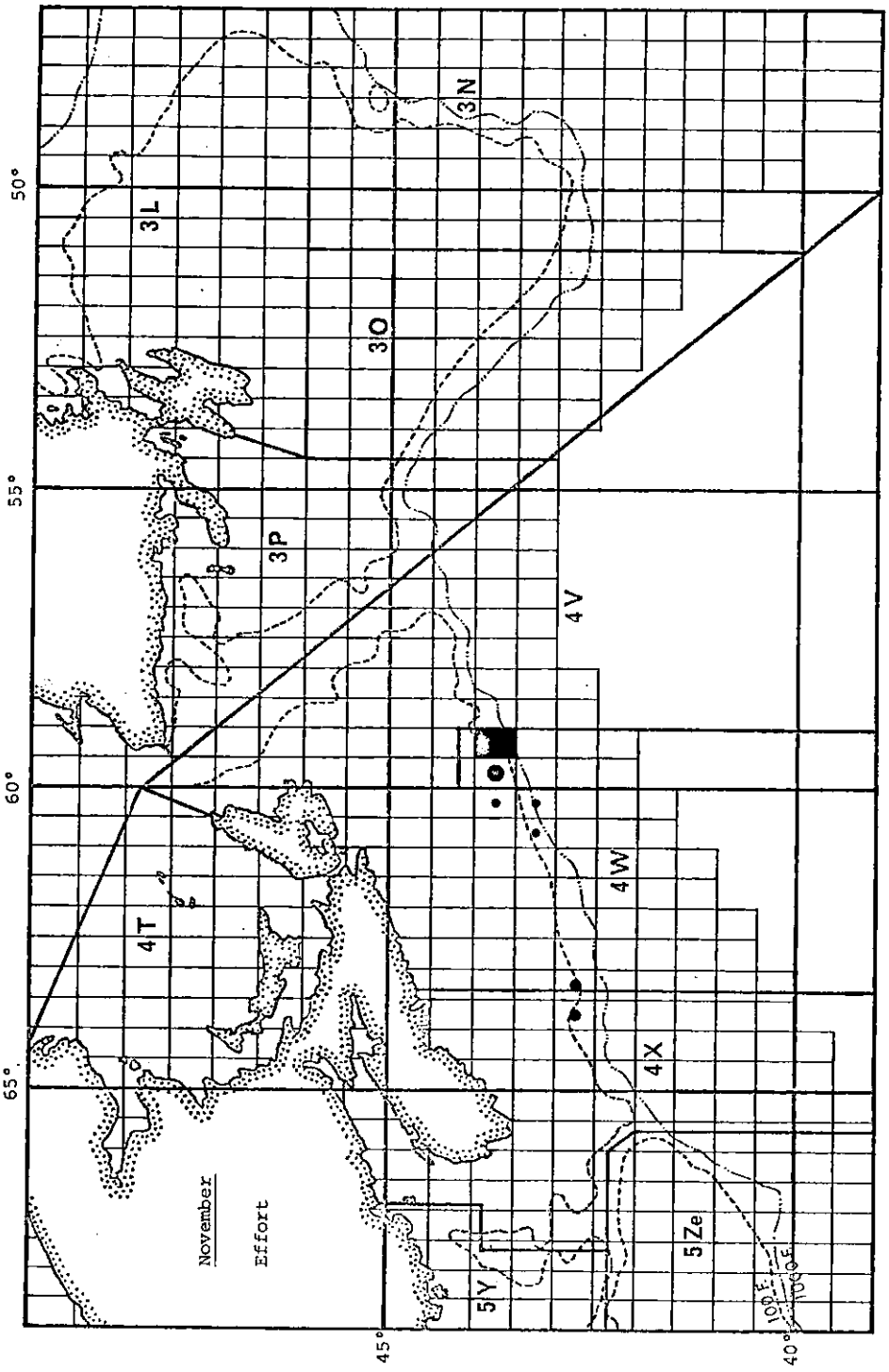

Fig. 1-5. November.

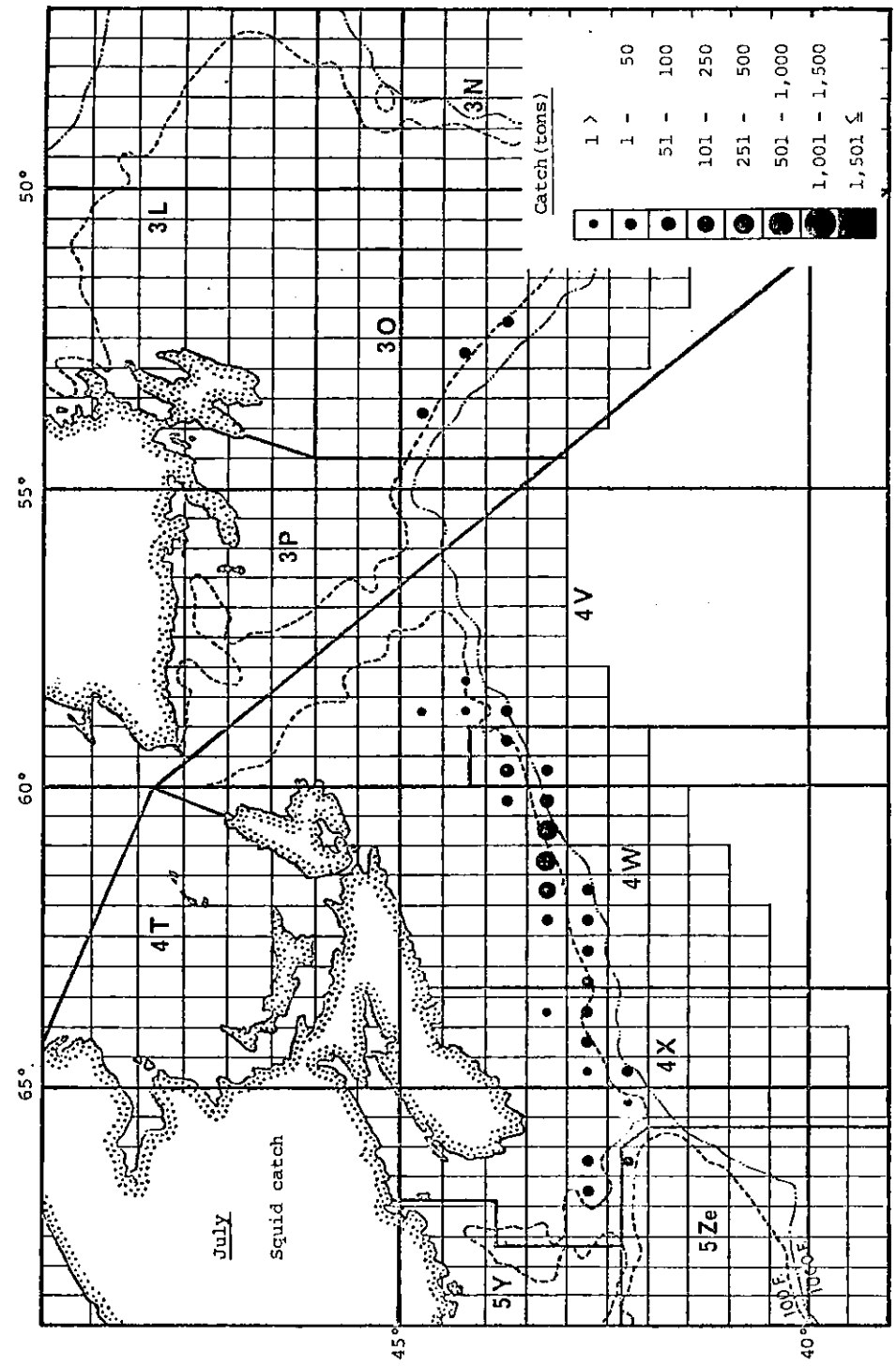

Fig. 2-1. Monthly changes in the locality of Illex catch by Japanese trawlers in 1978 fishing seasons.
July

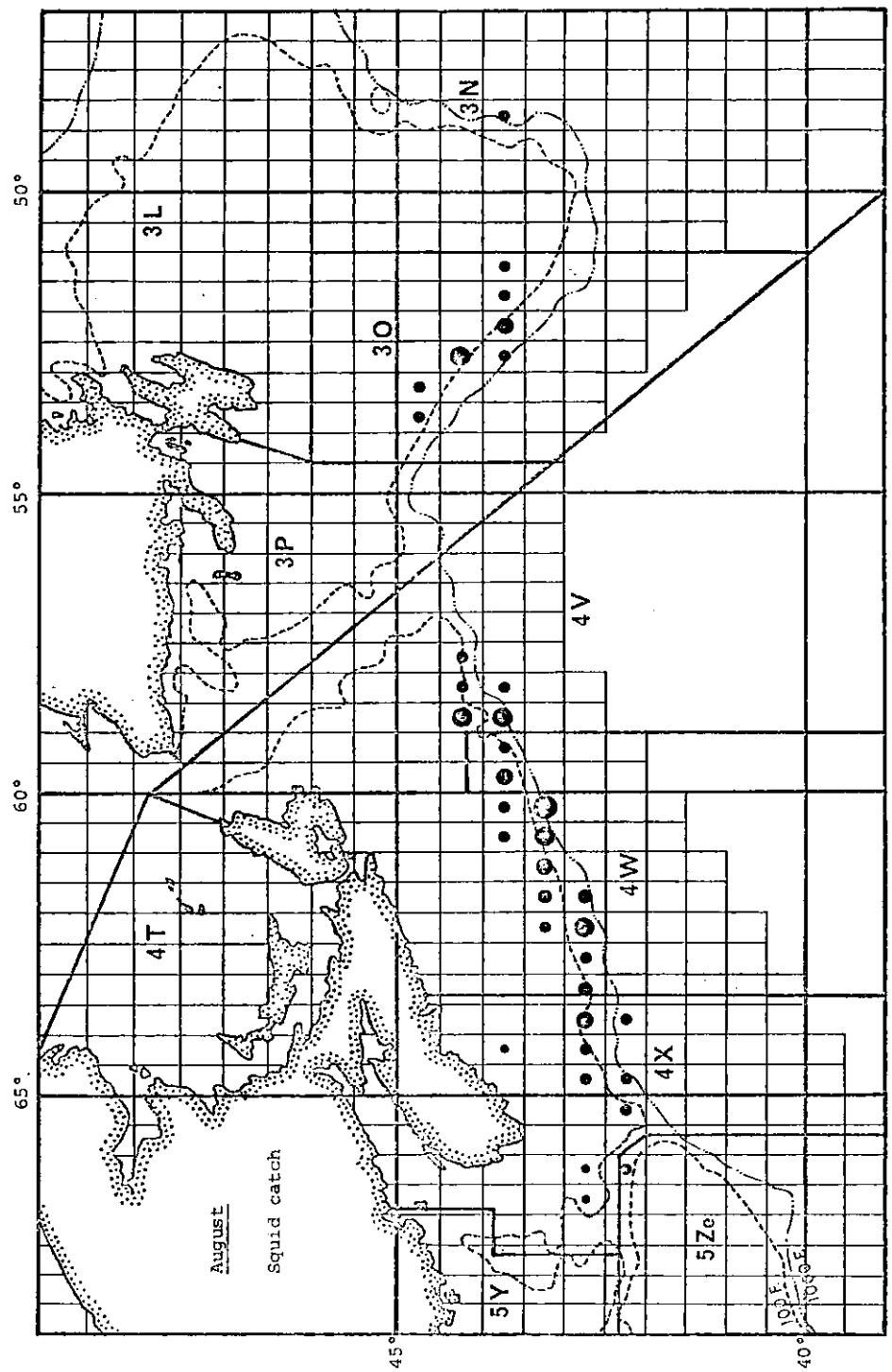

Fig. 2-2. August

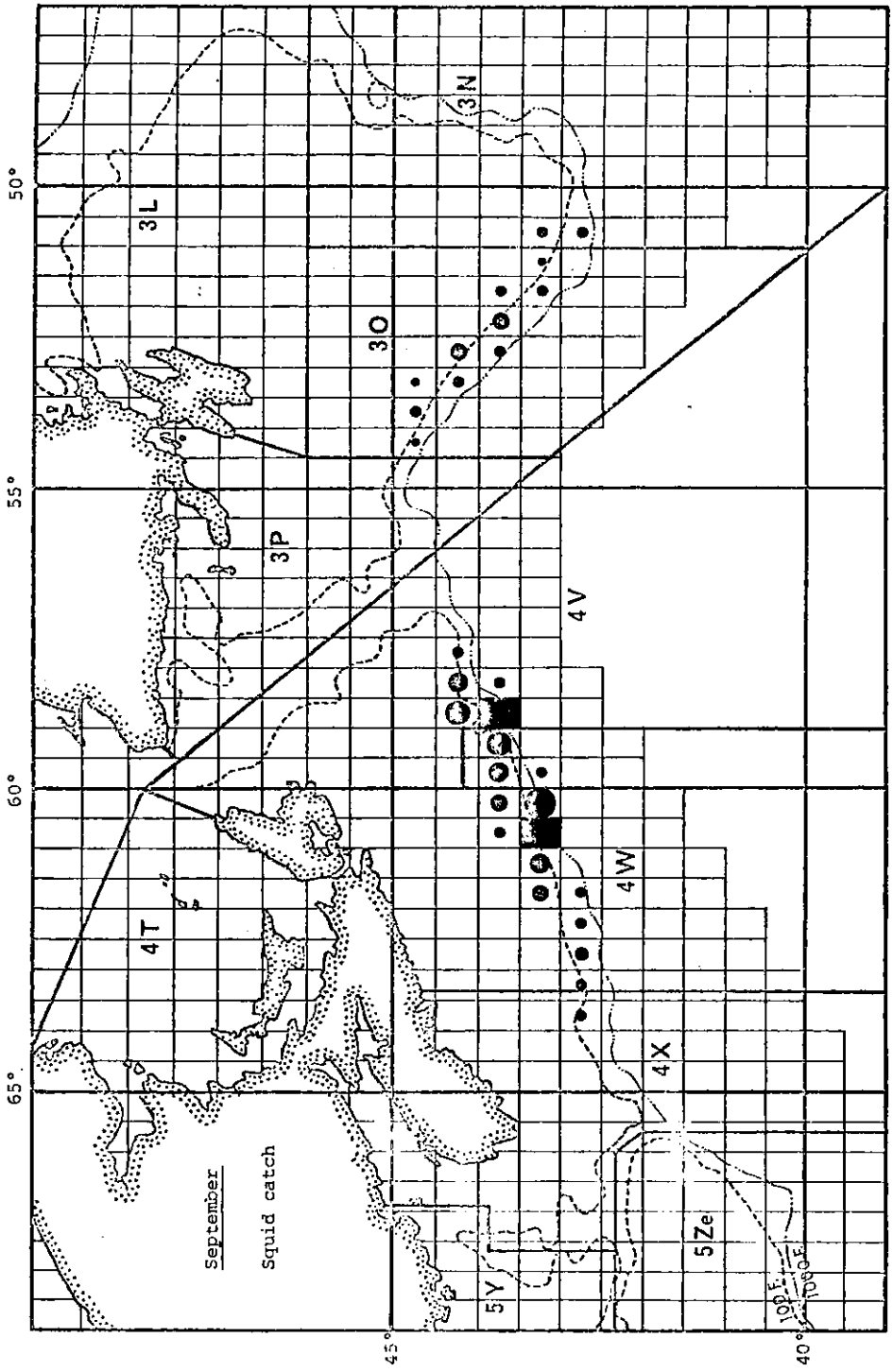

Fig. 2-3. September

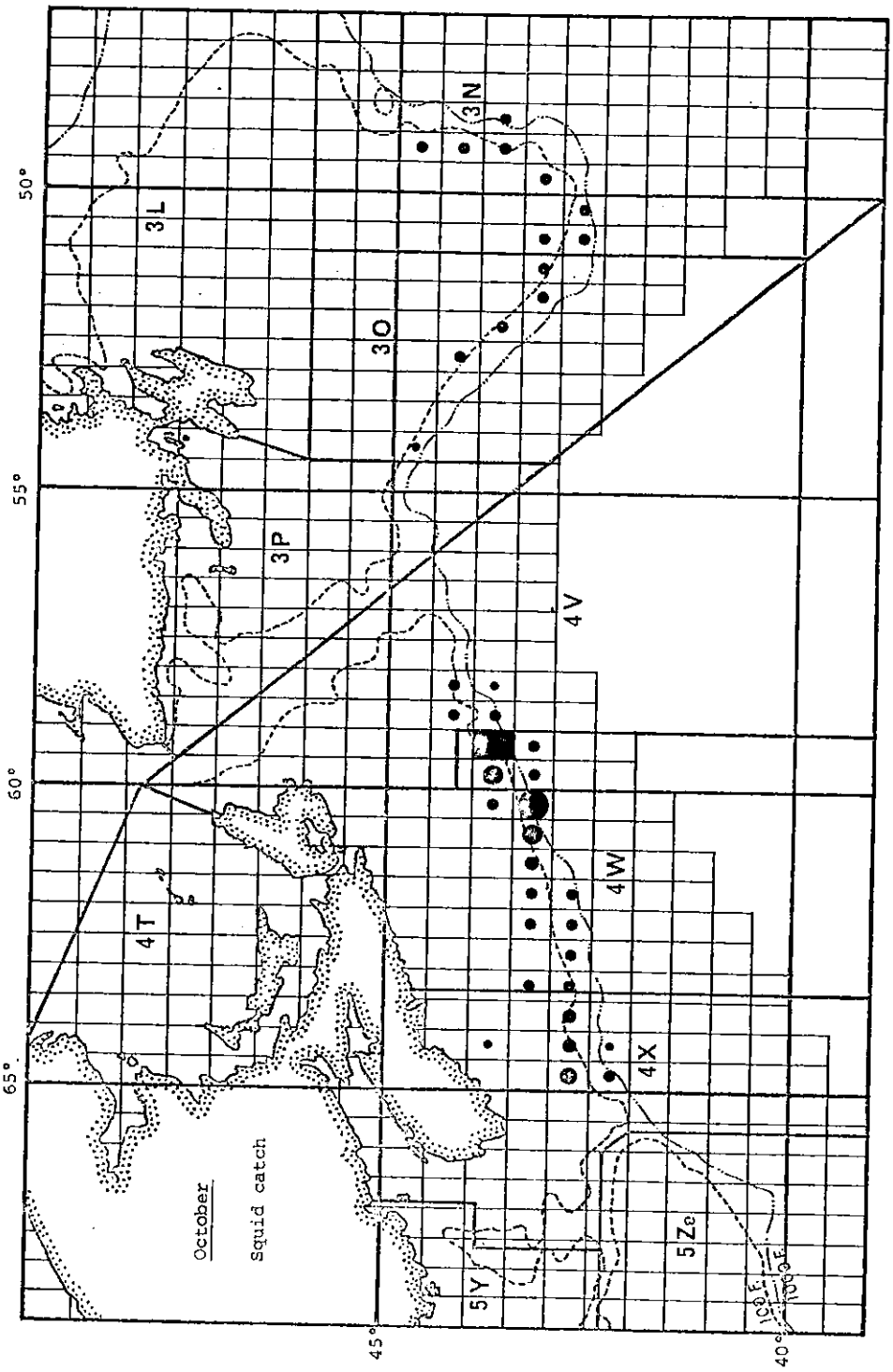

Fig. 2-4 October

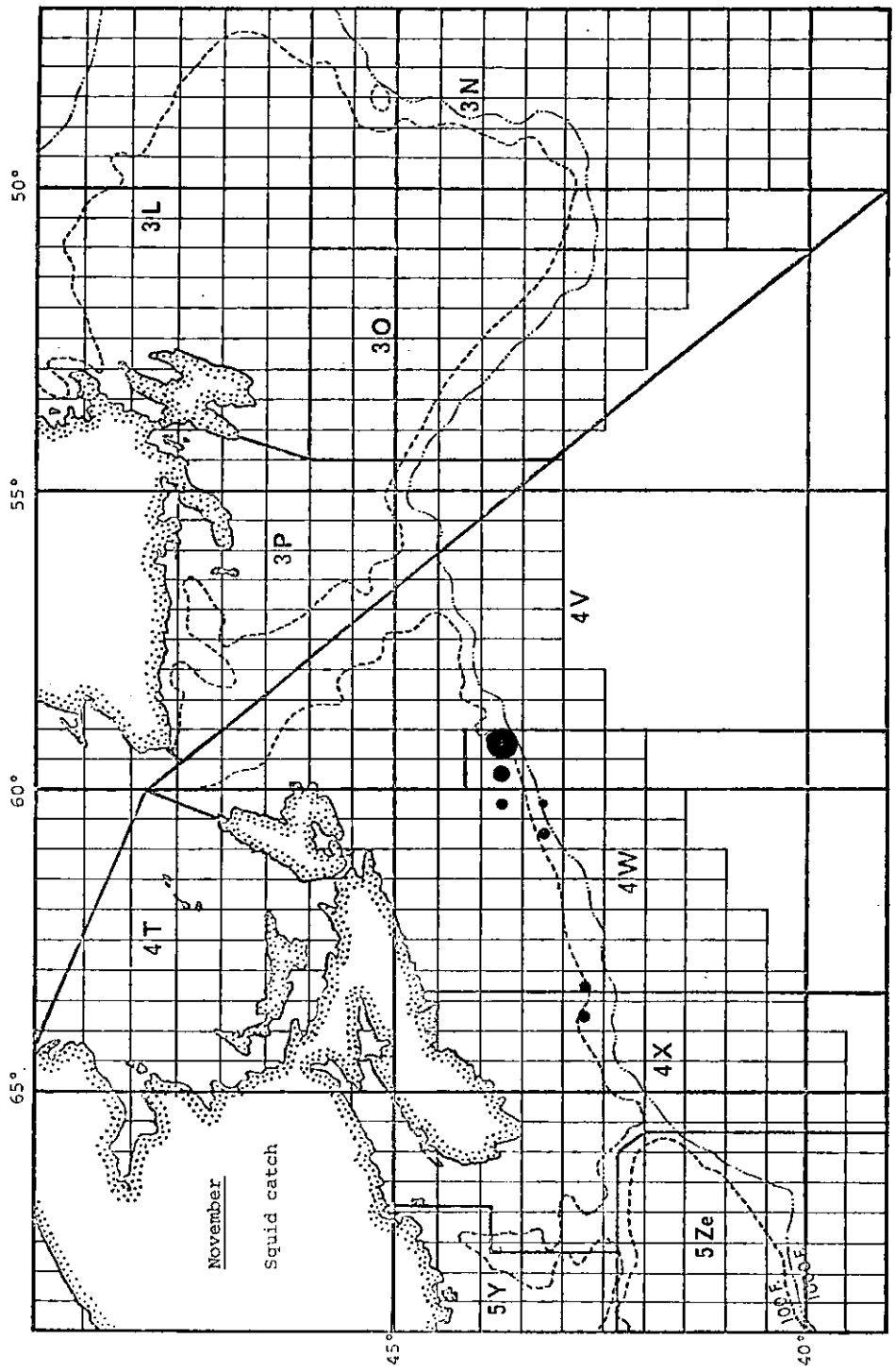

Fig. 2-5. November

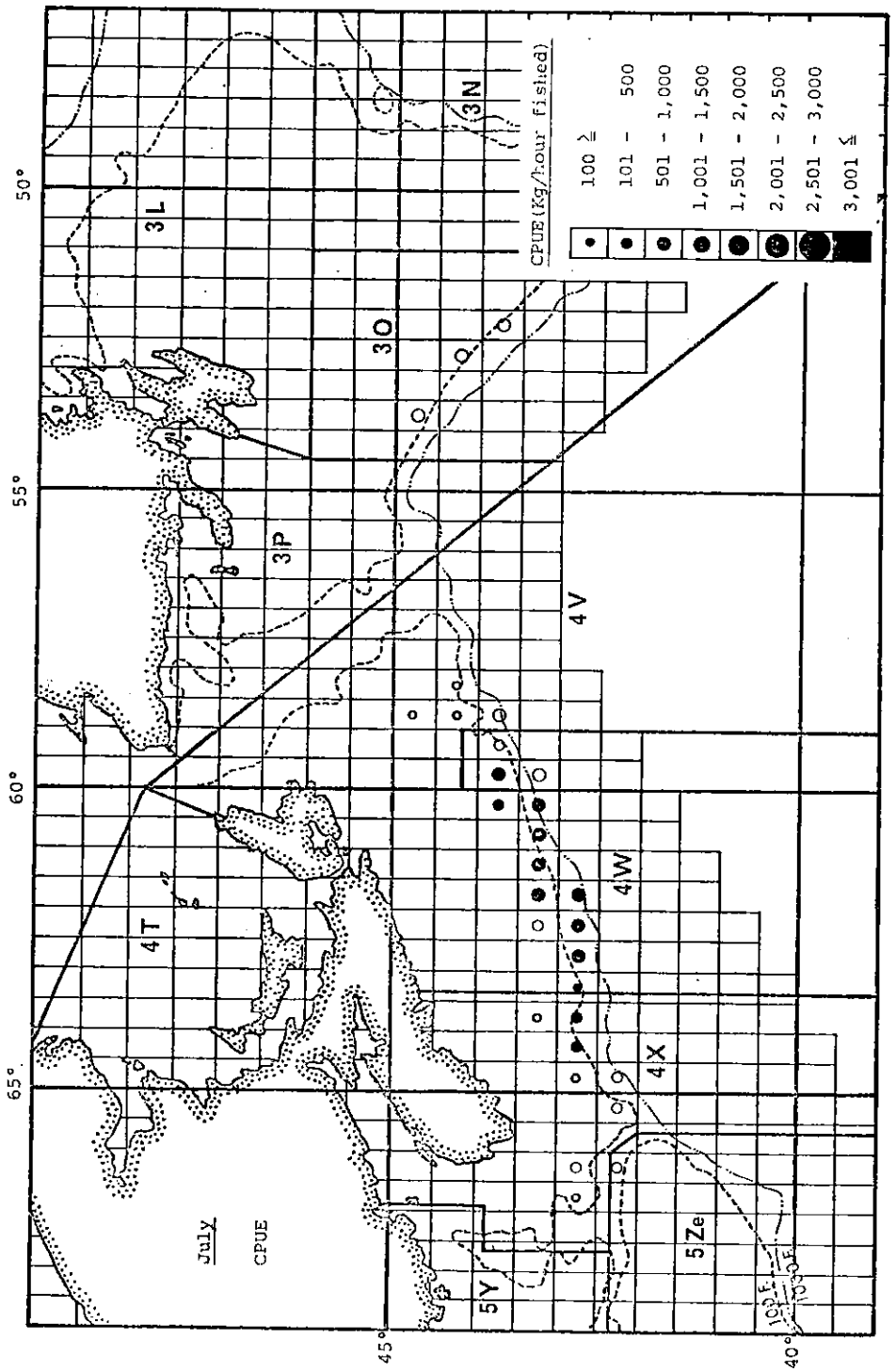

Fig. 3-1. Monthly changes in the locality of CPUE of Illex caught by Japanese trawlers in 1978 fishing season: July.
Open circles show the values of CPUE for the blocks where fishing effort expended were less than 25 hours fished per month.

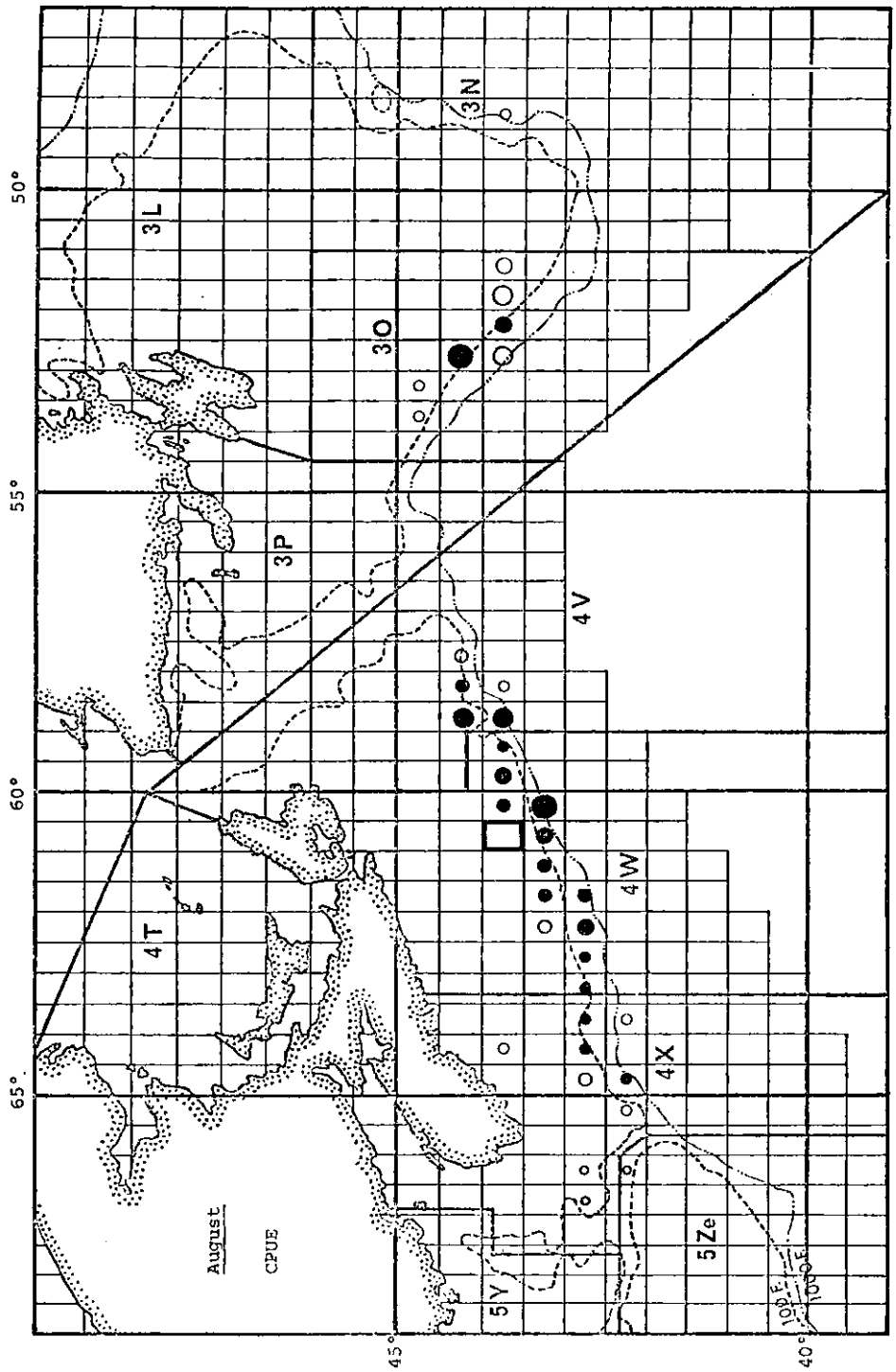

Fig. 3-2. August

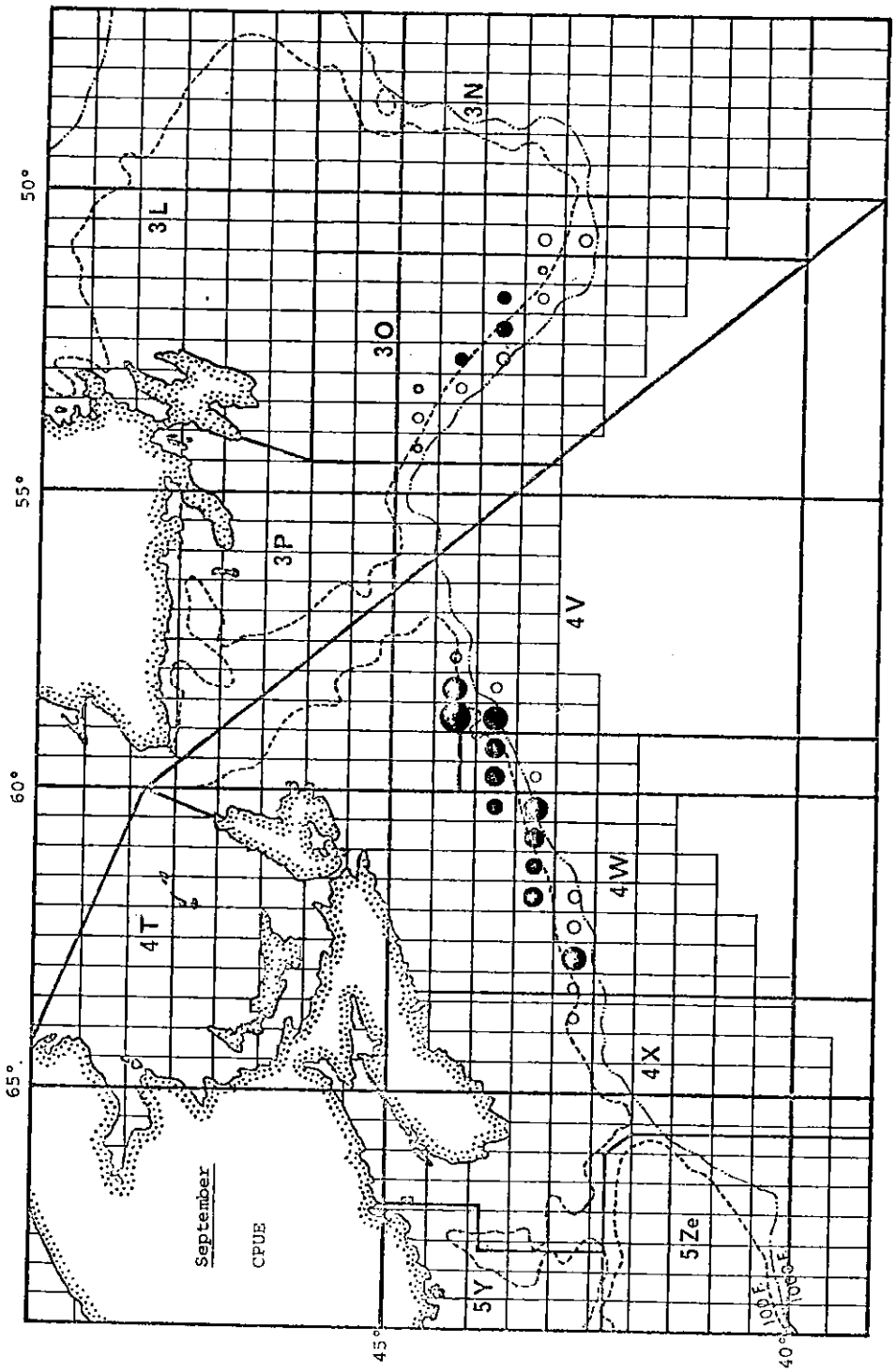

Fig. 3-3. September

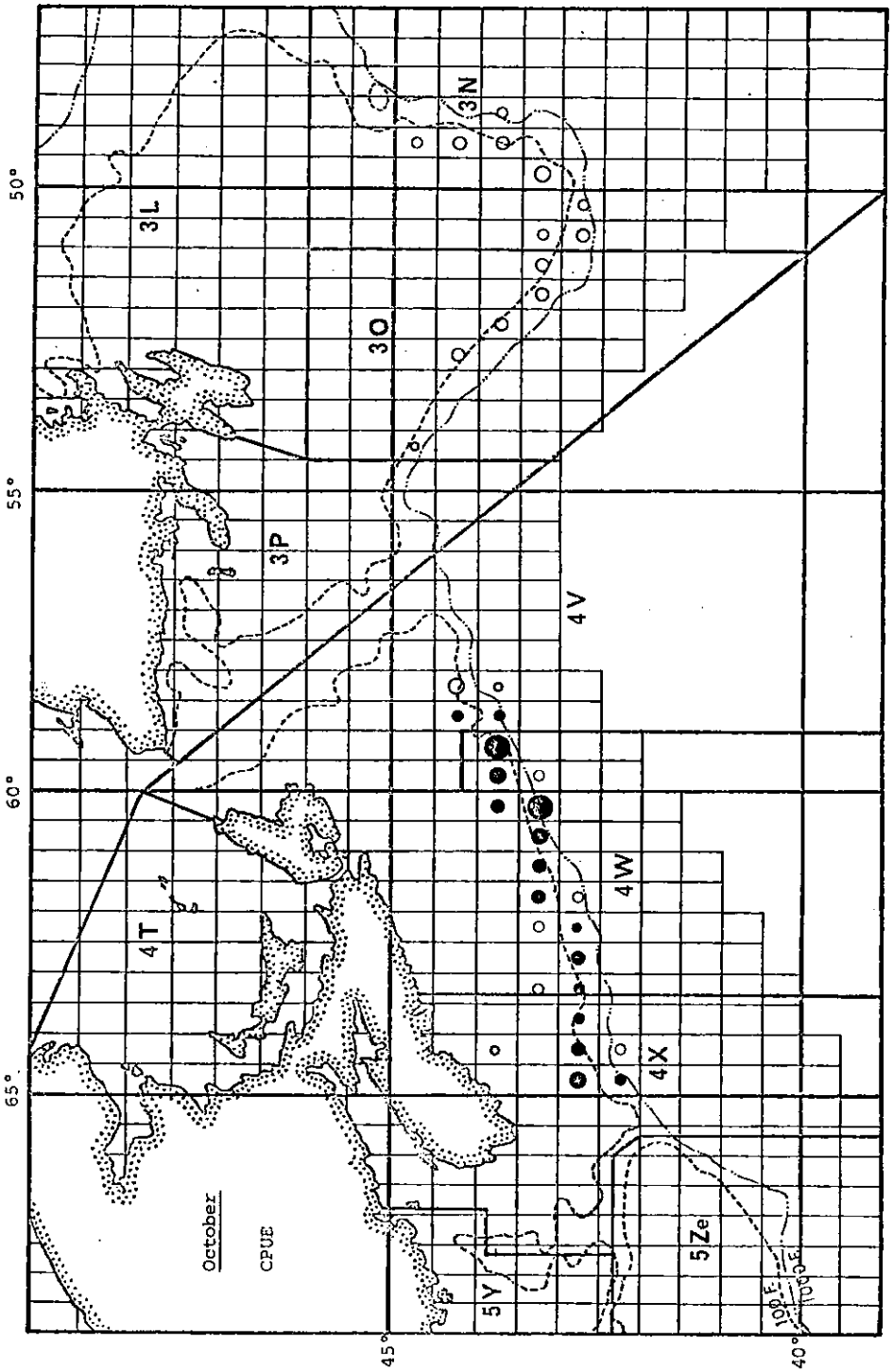

Fig. 3-4. October

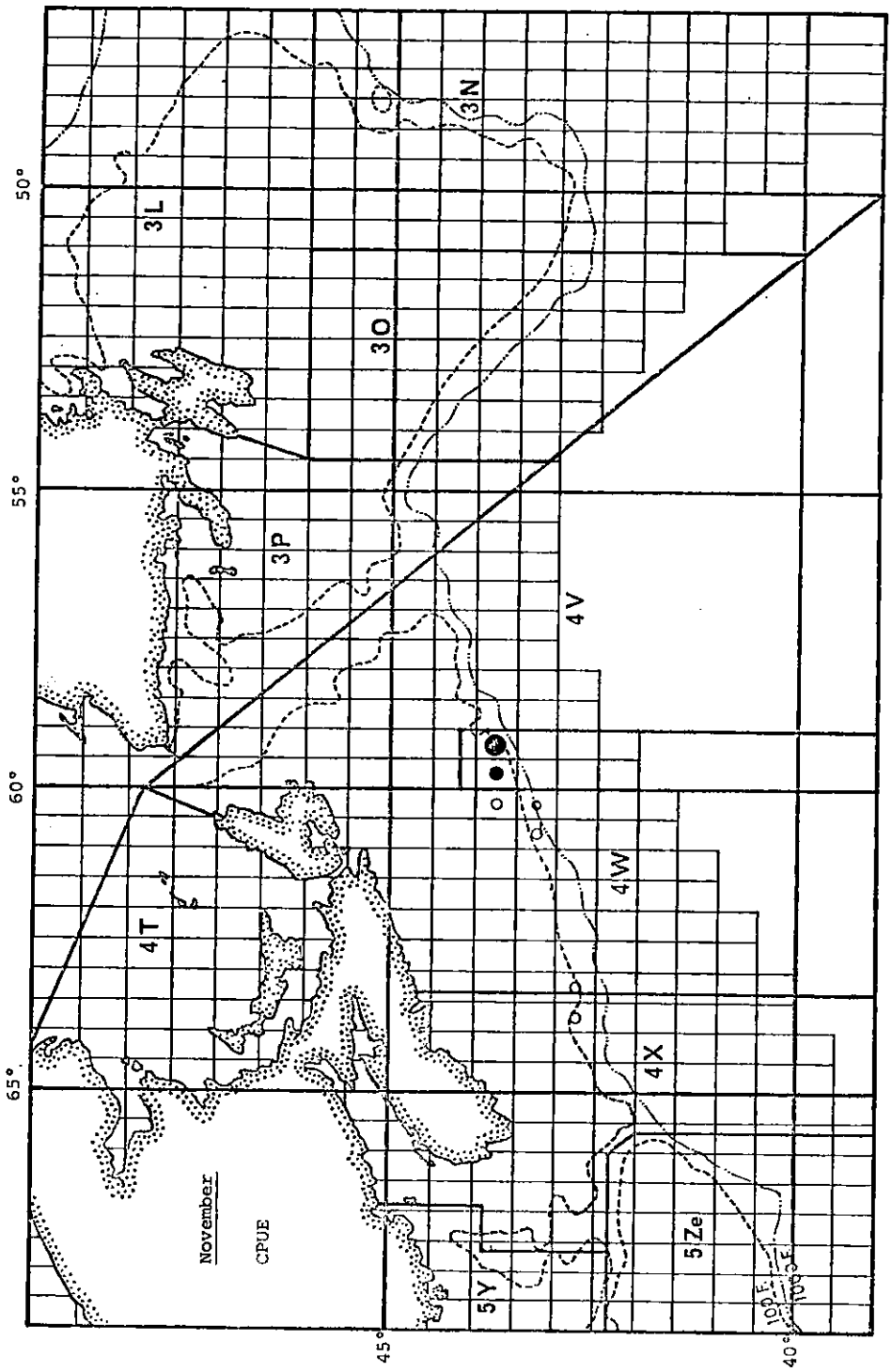

Fig. 3-5. November

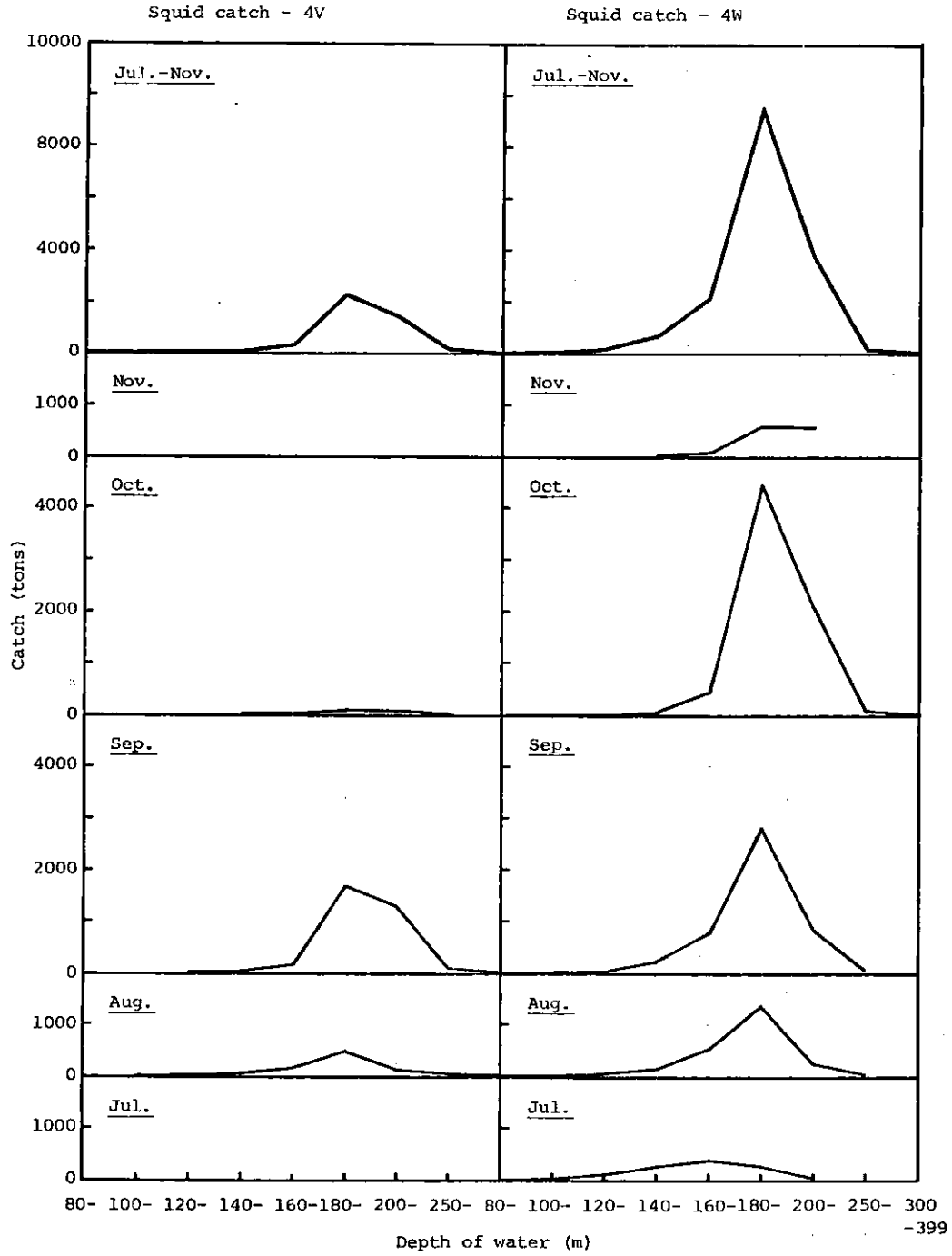

Fig. 4-1. Monthly changes in Japanese catch of Illex by Division and by depth zone in 1978 fishing seasons.

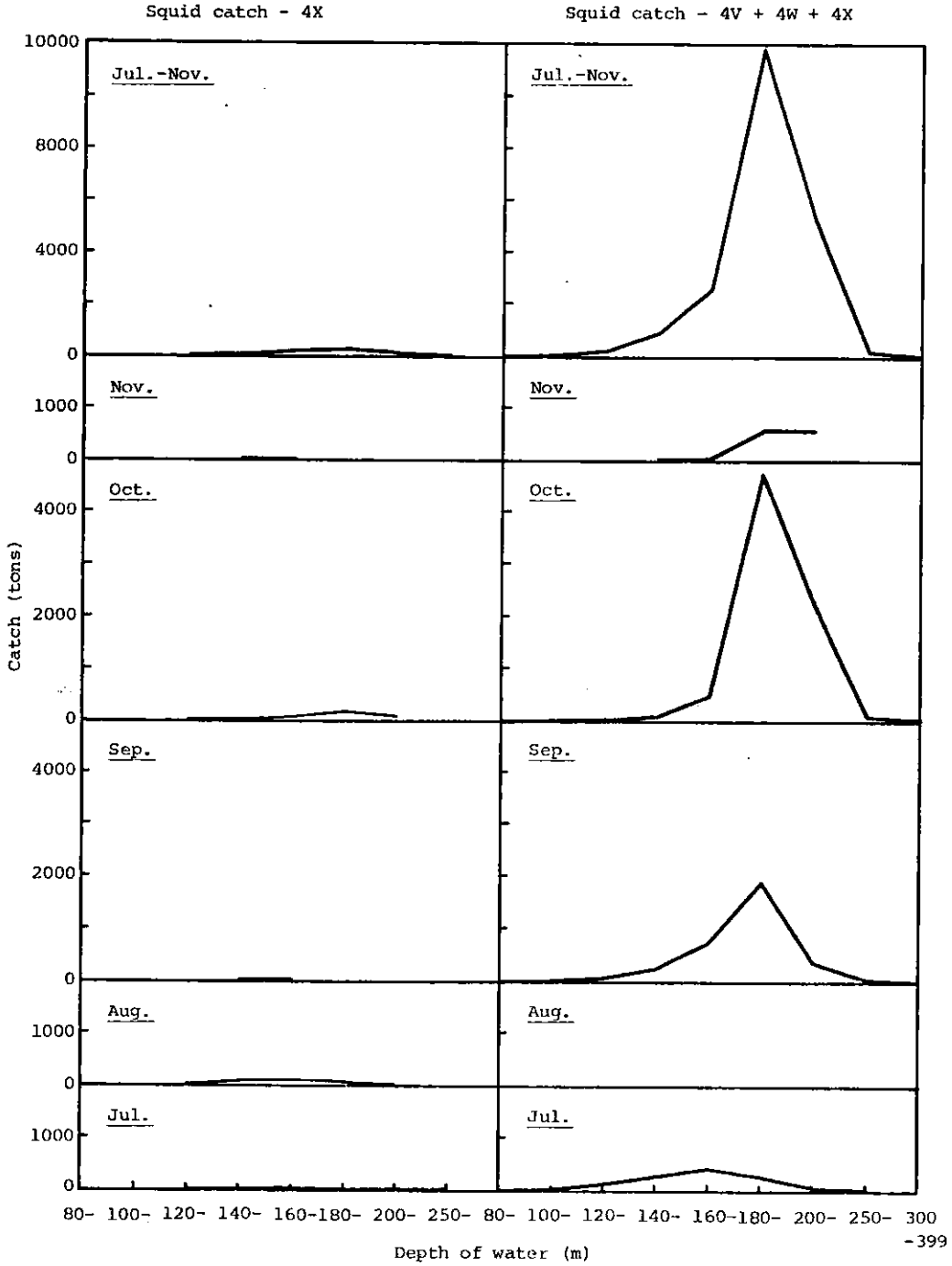

Fig. 4-2. Monthly changes in Japanese catch of Illex by Division and by depth zone in 1978 fishing seasons.

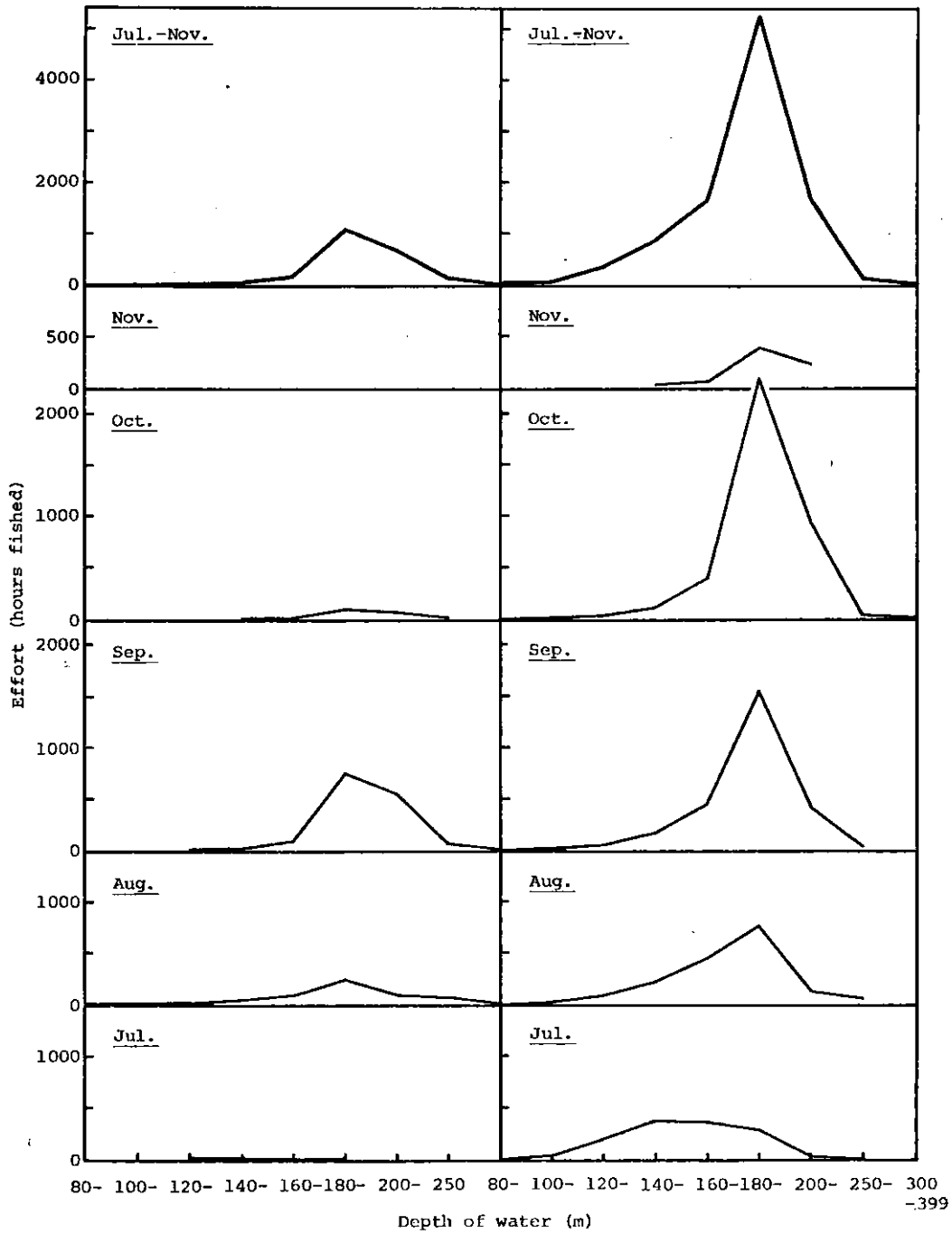

Fig. 5-1. Monthly changes in Japanese fishing effort by Division and by depth zone in 1978 fishing seasons.

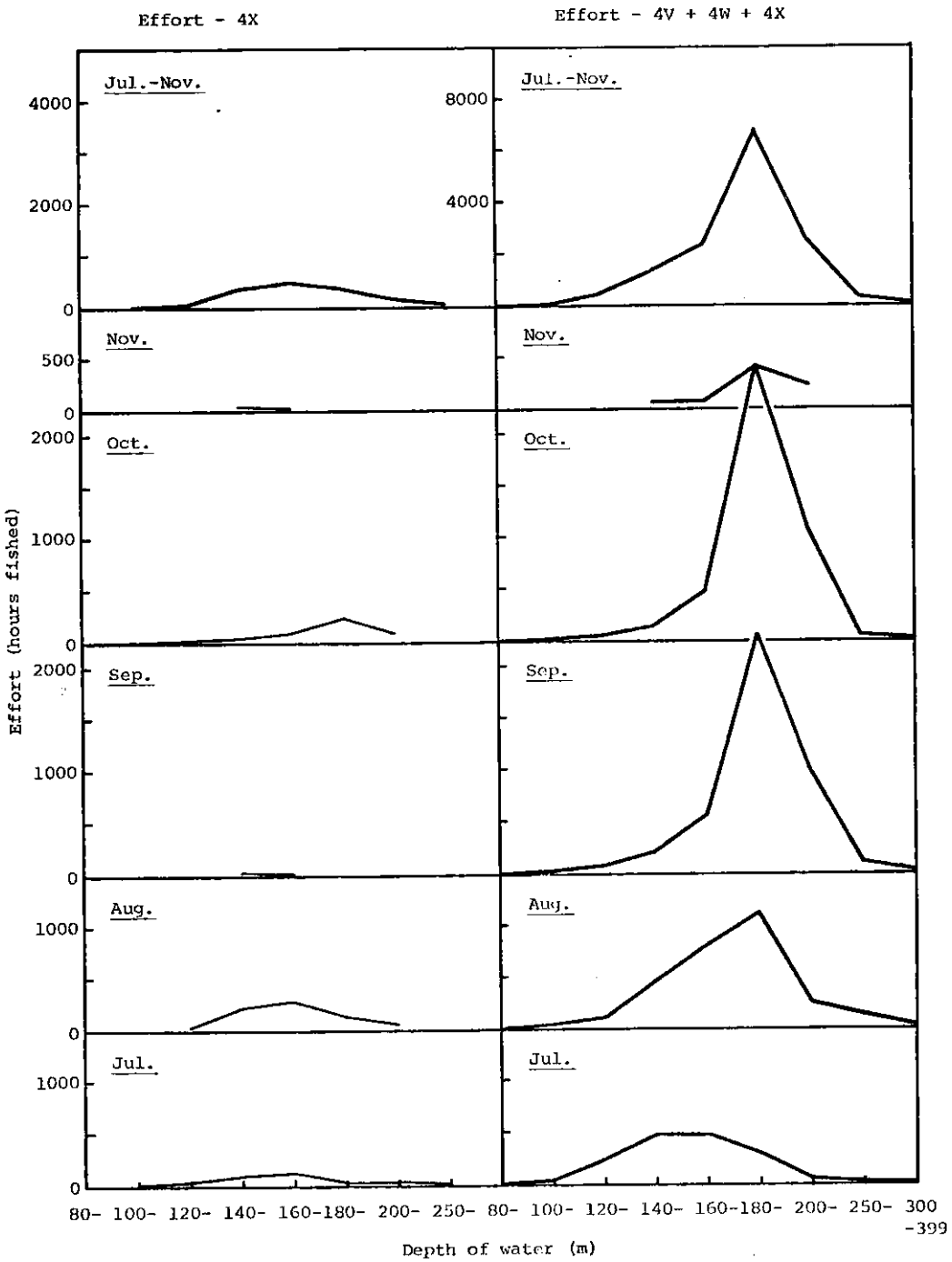

Fig. 5-2. Monthly changes in Japanese fishing effort by Division and by depth zone in 1978 fishing seasons.