

Northwest Atlantic



Fisheries Organization

Serial No. N676

NAFO SCR Doc. 83/VI/25

SCIENTIFIC COUNCIL MEETING - JUNE 1983

A review of the Japanese trawl fishery for squid (Illex illecebrosus)
in NAFO Subareas 3 and 4 in 1976-1982 fishing season

by

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The Japanese trawl fishery for squid (Illex illecebrosus) in NAFO Subareas 3 and 4 began in 1976, expanded greatly in 1978 and kept the high level up to 1980. However, the fishing activity weakened in 1981 and nearly ceased in 1982, because of the low catch rate of Illex.

Since the 1978 fishing season, the fishery had been outlined after each fishing season by Japanese scientists; Sato (1979), Hatanaka and Sato (1980), and Hatanaka (1981 and 1982). This paper updates the information and reviews the fishery in 1976-1982 fishing seasons, especially in Divisions 4VWX during 1978-1982.

1) General review of the fishery

The Illex-directed trawl fishery in Subareas 3 and 4 began in 1976, though a few thousand tonnes of Illex had been already taken in Subareas 5 and 6 by Japanese trawlers in each year since 1972 (Table 1). Under the national Illex quota of up to 3,000 tonnes for Subareas 3 and 4 combined, Japanese trawlers fulfilled the allowable catch in each of 1976 and 1977. Almost all of the catches were taken in Subarea 4, especially in Division 4W.

The Illex catch by Japanese trawlers in Subareas 3 and 4 sharply increased to about 26,000 tonnes in 1978 as a result of the increase of the national quota to 4,500 tonnes and the commencement of the Japan/Canada cooperative fishery. The Illex catch slightly declined to 23,700 tonnes in 1979 in spite of the substantial decrease in the fishing effort. In these two fishing seasons, the fishing operations for Illex by Japanese trawlers were made mainly on and along the southern edge of

the Scotian Shelf (Divisions 4VWX) and occasionally on the southwestern edge of the Grand Bank (Division 30).

After all, the cooperative fishery was carried out for two years, and the Japanese trawlers engaged in the fishery took about 21,400 tonnes and 19,200 tonnes of Illex in 1978 and 1979, respectively. Besides the trawlers, several Japanese jigging vessels operated all over the Scotian Shelf and on some parts of the Grand Bank, and caught 7,000 tonnes of Illex under the quota of 7,500 tonnes for the cooperative fishery in the 1979 fishing season (Hatanaka and Sato, 1980).

The Illex catch by Japanese trawlers in 1980 was nearly equal to the national quota of 17,000 tonnes including the transferred Canadian quota of 14,750 tonnes. However, the Illex catch declined to about 6,100 tonnes in 1981 and further shrank to only less than 300 tonnes in 1982, though the national Illex quota for Subareas 3 and 4 combined had been maintained at 17,000 tonnes since 1980. All of the Illex catches in these three fishing seasons were taken in Divisions 4VWX.

2) Yearly and seasonal changes of the fishery in Divisions 4VWX

As above-mentioned, Divisions 4VWX were the main fishing grounds for the Japanese Illex-directed trawl fishery in Subareas 3 and 4. Also, the annual Illex catches by Japanese trawlers in Divisions 4VWX accounted for 30-50 % of the annual total Illex catches in Subarea 4 by all countries during 1978-1981. Monthly fishing efforts, catches and catch rates for Illex in Divisions 4VWX by Japanese trawlers since 1978 when the full-scale operations began are presented in Fig. 1.

Most of the fishing effort of the Japanese trawlers was expended in Division 4W with a peak in October, and some in Division 4V in September in the 1978 fishing season. The fishing effort deployed in Division 4X was on a low level and some operations directed to Argentine were included. This fishing pattern was followed in 1979, but considerably changed in 1980 when the Japanese trawlers operated mainly in Division 4W in August and then concentrated into Division 4X from September to November. Few vessels operated in Division 4V throughout the 1980 fishing season. Though the fishing pattern in 1981 was similar to that in 1980, the total fishing effort declined and the fishing season ended earlier. In 1982, most of the Japanese trawlers operated in Divisions 4VWX in August, but all of them dispersed by the end of September.

The Illex catches by Japanese trawlers showed the same pattern as the fishing efforts in the yearly and seasonal changes. Illex was taken mainly in Divisions 4V and 4W in 1978 and 1979, in Divisions 4W and 4X in 1980 and 1981, but was scarcely taken in any of Divisions 4VWX in 1982.

The catch rates by the Japanese trawlers operated under the national quota were generally lower than those by the Japanese trawlers engaged

in the cooperative fishery. According to Hatanaka and Sato (1980), these low catch rates were probably due to a tactics that fishermen intended to make better products in quality rather than in quantity in order to gain the greater income from their limited quota. Therefore, the values from the cooperative fishery were used for the following considerations of the changes in the 1978 and 1979 fishing seasons, instead of those by all Japanese trawlers. Moreover, the catch rates irrespective of vessel size and gear type were used in this paper, since the sizes of Japanese trawlers and the trawl gears had not so changed during 1978-1982 and the differences in catch rate among the vessel sizes and gear types were not so large.

In 1978, the Illex catch rate in Division 4W gradually increased at first and then leveled off at slightly less than 2.0 tonnes per hour, while the catch rate in Division 4V reached a maximum of 2.4 tonnes per hour in September and declined soon. On the other hand, the catch rate in Division 4X was always low throughout the fishing season. Although a similar trend was observed in 1979, the level of the catch rate in each of Divisions 4V and 4W was considerably higher than that in 1978. The maximum values were 3.9 and 3.3 tonnes per hour in Divisions 4V and 4W, respectively. The similar high catch rates were also observed in Division 30 in these two fishing seasons.

In 1980, while rather higher catch rate of 1.6-1.0 tonnes per hour was observed in Division 4X from August through November, the values in Division 4V where the fishing effort was less than 50 hours fished and in Division 4W were significantly lower than those in 1979. The catch rates in the early 1981 fishing season were similar to those in 1980, but declined sharply after September. In 1982, few aggregations of Illex were found in any of Divisions 4VWX.

Thus, during 1978-1982 fishing seasons, the overall Illex catch rate in Divisions 4VWX showed a considerable year-to-year fluctuation with a decreasing trend since 1979, and the main fishing grounds were made up in different divisions from year to year. In addition, the catch rates varied seasonally with a peak during the period from August to October.

References

- Hatanaka, H. 1981. Outline of Japanese squid fishery in NAFO Subareas 3 and 4 in 1980. NAFO SCR Doc. 81/VI/30.
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- Hatanaka, H. and T. Sato. 1980. Outline of Japanese squid fishery in Subareas 3 and 4 in 1979. NAFO SCR Doc. 80/II/8.
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Table 1. Catches by all countries and Japanese trawlers, TACs and Japanese national quotas for Illex in Subareas 3 and 4, 1975-1982.

Year	Catch by all countries (tonnes) ¹			TAC (tonnes)	Catch by Japanese trawlers (tonnes) ²			Quota (tonnes)
	Subarea 3	Subarea 4	Total		Subarea 3	Subarea 4	Total	
1975	3,751	13,993	17,744	25,000 ³	128	456	584	up to 3,000
1976	11,257	30,510	41,767	25,000 ³	72	2,983	3,055	up to 3,000
1977	32,748	50,726	83,480	25,000 ³	0	3,145	3,145	up to 3,000
1978	40,697	51,987	92,684	100,000	2,216	23,740	25,956	27,750 ⁴
1979	81,820	71,279	153,099	120,000	737	22,991	23,728	22,735 ⁵
1980	34,779	34,826	69,606	150,000	0	16,675	16,675	17,000 ⁶
1981	18,020	14,521	32,541	150,000	0	6,055	6,055	17,000 ⁶
1982	not available			150,000	0	273	273	17,000 ⁶

1. from Scientific Council Reports 1982.

2. slightly modified from ICNAF and NAFO Statistical Bulletins.

3. countries without specific allocations could each take up to 3,000 tonnes.

4. including the Illex quota of 23,250 tonnes for the Japan/Canada cooperative fishery.

5. including the Illex quota of 18,135 tonnes for the cooperative trawl fishery and the special quota of 100 tonnes for the research survey.

6. including the transferred Canadian Illex quota of 14,750 tonnes.

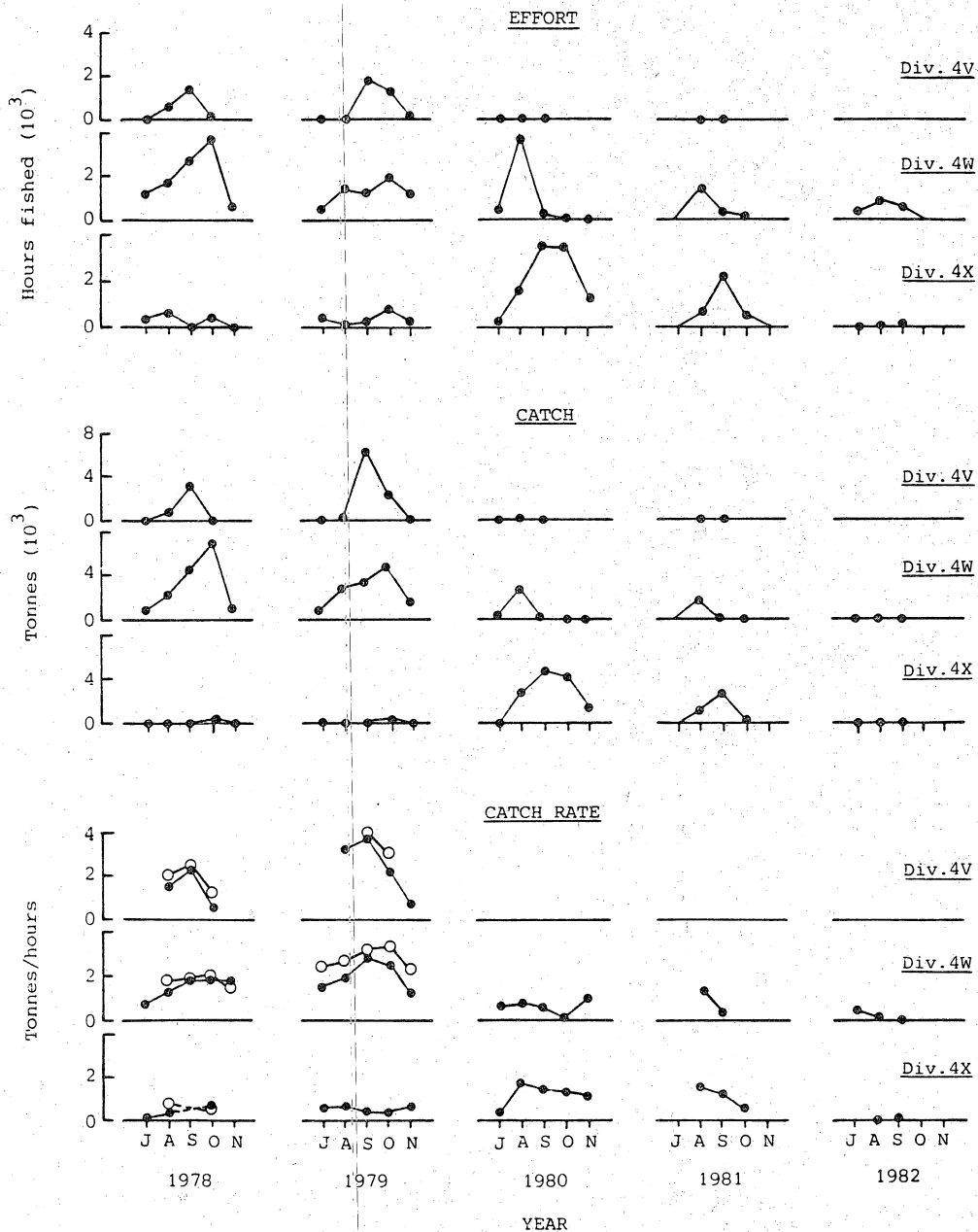


Fig.1. Monthly fishing efforts, catches and catch rates of *Illex* in Divisions 4VWX by Japanese trawlers in 1978-1982 fishing seasons.

In the catch rate, only the values based on the fishing effort equal to or more than 50 hours fished are presented. ○—○; the catch rates of the Japanese trawlers engaged in the Japan/Canada cooperative fishery.