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ANNEX TO THE
**WORLDWIDE FISHERIES
MARKETING STUDY:**
PROSPECTS TO 1985

JAPAN



Government
of Canada

Gouvernement
du Canada

Fisheries
and Oceans

Pêches
et Océans

Industry, Trade
and Commerce

Industrie
et Commerce

Canada, Dept. of Fisheries and Oceans. Fisheries Economic Development
& Marketing. Marketing Services Branch.

(This Report is one of a series of country and species annexes
to the main study - entitled the Overview).

D R A F I

Annex to the
Worldwide Fisheries Marketing Study:
Prospects to 1985

JAPAN [v. 7]

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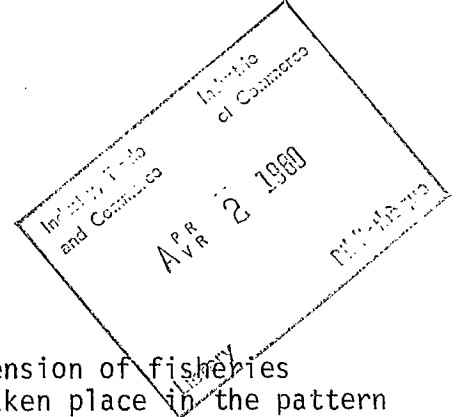
The views expressed in this Study, however, are ours alone and reflect the Canadian perception of worldwide markets.

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FOREWORD



As a consequence of global extension of fisheries jurisdictions, a radical shift has taken place in the pattern of worldwide fish supply and demand. This change is still going on and will continue for many years before an equilibrium situation is reached. However, in the midst of this re-adjustment, a new trade pattern is emerging -- some net exporting countries are now importing and vice versa. In the longer term, some countries will experience shortages of supply and others will have a surplus. Fortunately, Canada is amongst the latter group.

The implications for the marketing of Canadian fisheries products arising from the worldwide introduction of the 200-mile limit are extensive. With our vastly improved supply position relative to world demand, government and industry are understandably concerned about ensuring that the bright promise of increased market opportunities are real and can be fulfilled. One of the steps in this process is the publication of the Worldwide Fisheries Marketing Study which assesses the potential on a country and species basis.

Specifically, the purpose of the Study is to identify the short (1981) and longer-term (1985) market opportunities for selected traditional and non-traditional species in existing and prospective markets. In this initial phase, 14 country markets and 8 species groups are analysed. It should be noted that while the information contained in the Reports was up-to-date when collected during March-June 1979, some information may now be dated given the speed with which changes are occurring in the marketplace. In this same vein, the market projections to 1981 and 1985 should be viewed with caution given the present and still evolving re-alignment in the pattern of international fisheries trade, keeping in mind the variability of key factors such as foreign exchange rates, energy costs, bilateral fisheries arrangements and the recently concluded GATT-MTN agreements which have a direct effect on trade flows.

Notwithstanding, the findings contained in these Reports represent an important consolidation of knowledge regarding market potential and implications for improvements in our existing marketing and production practices.

Thus, the results of the Study should usefully serve as a basis for planning fisheries development and marketing activities by both government and industry in order to capitalize on the identified market opportunities.

This draft Report is published for discussion purposes and as such we invite your critical comments.

Ed Wong

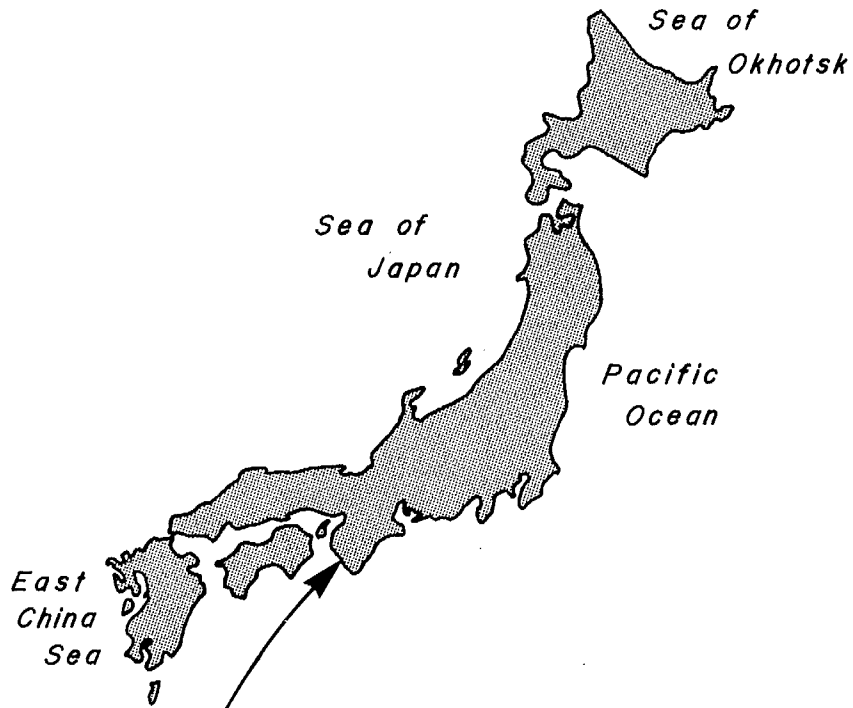
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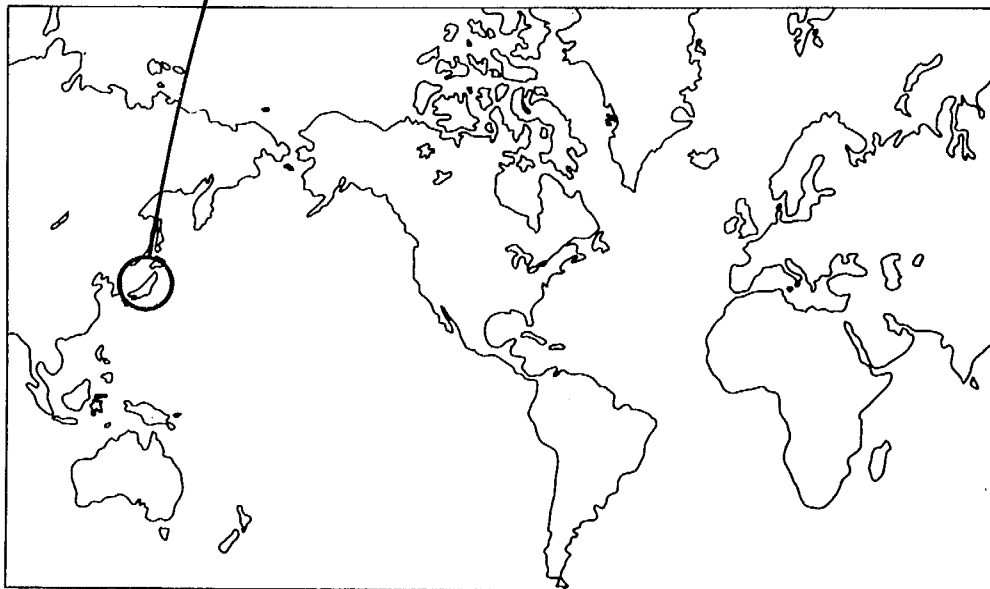
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JAPAN



INDEX MAP



I. DEMAND

The Japanese are one of the world's premier fish eaters. Whether at home or in the sushi shops, fish plays an important role in the Japanese diet. Per capita consumption (see Table I-1) peaked in 1974 at 70.2 kg a year and has dropped slightly since then to 65.7 kg annually in 1977. Like most Western industrialized societies, Japan is feeling the effects of new economic pressures which are forcing a change in eating habits. Higher incomes, more working women, increased leisure time and interest in Western-style food and food preparations are among the causes of a slow-down in Japanese fish consumption.

Even so, the Japanese eat far more fish per person than most consumers in North America and Europe and by 1985 the Japanese are still expected to consume 65 kg of fish per capita annually. While the growth in fish consumption has levelled off from the 1970s (see Table I-2). In 1975, for the first time, fish accounted for less than half of all per capita animal protein consumption. Of some concern for the future, therefore, is the degree to which fish continues to lose market share to competing forms of animal protein.

However, the varying proportions may be the result of special factors which, if not put into perspective, tend to blur the overwhelming importance of fish. One plausible cause for the declining relative importance of fish in the late 1970s is rapidly rising

Table 1-1

DOMESTIC CONSUMPTION OF FISHERIES PRODUCTS

	1965	1970	1971	1972	1973	1974	1975	1976	1977	1981	1985
Population (thousands)	98,275	103,720	105,014	107,332	108,710	110,573	111,940	113,089	114,154	118,739	122,333
Total Domestic demand ('000 tonnes)	6,477	8,631	9,187	9,693	10,431	10,166	10,016	10,097	10,319	10,686	11,010
Less inedibles ('000 tonnes)	1,429	2,275	2,166	2,429	2,895	2,405	2,467	2,334	2,815	2,968	3,058
Net edible ('000 tonnes)	5,048	6,356	7,021	7,264	7,536	7,761	7,547	7,763	7,504	7,718	7,952
Per capita domestic demand (KG)	65.9	83.2	87.5	90.3	96.0	91.9	89.5	89.3	90.4	90.0	90.0
Per capita net edible (KG)	51.4	61.3	66.9	67.7	69.3	70.2	67.4	68.6	65.7	65.0	65.0

TABLE 1-2

PER CAPITA ANIMAL PROTEIN CONSUMPTION

	<u>1960</u>	<u>1965</u>	<u>1970</u>	<u>1975</u>
Total Animal Protein	100.0%	100.0%	100.0%	100.0%
Fish Protein	68.9%	56.3%	50.2%	48.7%
Other Animal Protein	31.1%	43.1%	49.8%	51.3%

fish prices. As can be seen from Chart I prices for fish in the mid 1970s rose significantly faster than for meat and for all food. Naturally with such pressures consumers react by changing their eating habits, at least temporarily.

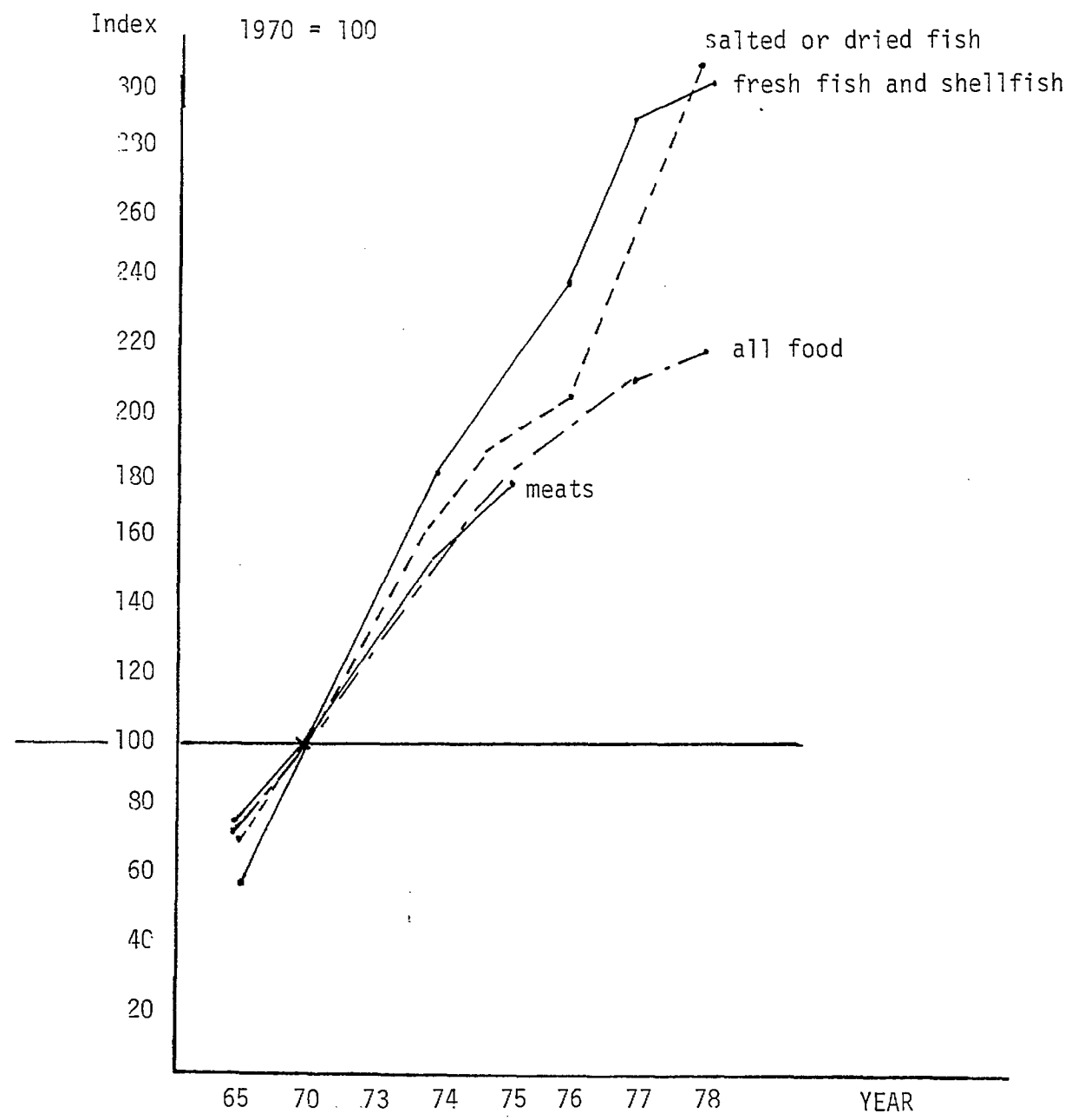
The net effect has been to narrow the price gap between fish and meat so that it has become easier, if a consumer so chooses, to substitute meat for fish. While there is no clear-cut evidence that consumers prefer meat to fish, a recent Japanese survey indicated that 42% of housewives interviewed wanted to increase their use of meats while only 26% wished to add to fish consumption. On the assumption that the survey is reasonably reliable, the results indicate that given an opportunity, more consumers will likely add to their consumption of meat rather than fish. Although the survey shows that more housewives wish to increase use of meat, it does not follow that consumers prefer meat to fish. In fact, another survey concludes that 62% of those interviewed like fish dishes compared with 16% who disliked fish dishes. The survey (see Table I-3) also shows that, as consumers grow older they prefer to eat more fish. The under 20 age group is most resistant with almost 30% of those surveyed registering a dislike for fish while only 12.8% of those under 60 years were like-minded.

TABLE 1-3
PREFERENCE FOR FISH BY AGE GROUPS

	<u>All Age Groups (%)</u>	<u>Under 10</u>	<u>Under 20</u>	<u>Under 30</u>	<u>Under 40</u>	<u>Under 50</u>	<u>Under 60</u>	<u>60 and Over</u>
Like fish	61.9	52.6	46.1	57.2	74.6	71.2	69.7	81.4
Don't know	21.6	32.8	24.5	24.0	14.9	15.6	17.4	10.5
Dislike fish	16.5	14.6	29.4	18.9	10.5	13.2	12.8	8.1

One conundrum contained in the survey is the future importance of fish in Japanese diets. For example, if the under-20 age group preference is accurate, will young people retain their dislike for fish as they grow older? Or does consumer taste for fish products mature with age, thereby nullifying the threat of other proteins gaining ground on fish? Although the full answer probably lies with another survey taken several years hence, it is assumed by many Japanese that consumers turn to fish as they grow older. Nevertheless, consumers have already shown that, in some cases, they are sensitive to sharp price escalations for fish products. Not surprisingly, the Japanese government is concerned about maintaining supplies and, where possible, easing price pressures. Even though the advent of the 200 mile fisheries zone has altered the supply-demand balance, it appears that Japanese landings, at least in 1977, were not significantly curtailed. For that reason, declining supplies cannot simply be blamed for the fall in the relative importance of fish as a protein source.

CHART 1
Consumer Price Index



Taken along with other trends on fish supply, the introduction of national fishing jurisdictions certainly has helped create a general climate of higher prices. With the loss of access to traditional fishing grounds now claimed by the Soviet Union and the United States, Japan naturally experienced the effects of higher prices for fish products. But it is vital to keep the influence of 200 mile fisheries zones in balance when assessing future market opportunities. It is clear that, in historical terms, the implementation of fishing sovereignties has accelerated rather than created the trends now cropping up in fish supply and end-use patterns. On this basis, therefore, it is possible to make some informed assessment of future market prospects.

As a first step, given uncertainties over consumer response to even higher prices in future, a reappraisal of anticipated fish eating habits will be in order. A 1975 Japanese government white paper had optimistically forecast a healthy jump in per capita consumption to 129 kg round weight in 1985 compared with 89 kg in 1975 - a 45% increase over the 10-year period. Based on the historical record of a 35% increase in consumption between 1965 and 1975, the projection did not seem out of line. Now, instead, more modest gains to 90 kg are forecasted.

Curiously, although higher prices have been a deterrent to overall demand, there is a definite leaning among consumers for more expensive "preferred" species. There are three

informal categories of choice among fish buyers. Highly preferred and preferred species include yellowfin, tuna, crabs, seabream, salmon, skipjack, bastard halibut and squid; less-preferred fish include mackerel, cod, sardines and saury. All Japanese, whether primary producers or final consumers, appear to differentiate the various species in this way although regional differences are evident too. As a result, classification is largely by convention with no well-defined criteria.

A review of household fish purchasing patterns reveals that in 1963 the quantity of preferred species accounted for about 30% of the total fish and fish products purchased while the less-preferred species accounted for 40%. By 1975 the proportion had shifted markedly; preferred species represented 41% of fish purchases by quantity while less-preferred fish accounted for 29% of the total.

Implicit in the trend is an apparent consumer desire to eat more preferred species even if, because of rising prices, one is forced to decrease the quantity consumed. The evidence for this trend is contained in Table 1-4 which shows purchase by income groups of selected species as of 1975. Perhaps of greatest significance to market analysts is the demand shown for high-priced preferred species by both high and low income groups. For example, for every one kg of yellowtail purchased by high-income groups, low-income consumers buy almost as much. But, surprisingly, the gap between high and low income groups widens for lower-priced, less-preferred species such

as mackerel. Here, for every one kg purchased by high-income consumers, only .25 units are bought by low-income Japanese. Clearly, even as incomes fall, consumers will not switch necessarily to less preferred species.

TABLE 1-4

	<u>Price (Yen/100g)</u>	<u>H_Q/L_Q</u>
Tuna	189.7	1.64
Salmon	99.6	1.63
Yellowtail	174.5	1.91
Shrimps & Crabs	147.3	1.88
Jack Mackerel	69.9	1.25
Mackerel	35.1	0.95
Sardines	35.0	1.32
Saury	55.3	1.09

H_Q - Purchase quantity of high income group.

L_Q - Purchase quantity of low income group.

However, even if consumers remain loyal to higher-priced species, they compensate by reducing the amount they purchase. Thus, in the trade-off between price and taste preference, overall demand for fish is lower than anticipated. Obviously, there is an upper limit to prices beyond which consumers switch to meat or cheaper fish. In 1977, for instance spiralling fish prices

TABLE II-1
 JAPANESE LANDINGS BY MAJOR SPECIES
 ('000 Tonnes)

	1972	1973	1974	1975	1976	1977
Alaska Pollock (3,035	3,021	2,856	2,677	2,445	1,931
Sardines	58	297	352	526	1,066	1,420
Mackere1	1,190	1,134	1,331	1,315	979	1,355
Skipjack	223	322	347	259	331	309
Flatfishes	348	379	349	341	345	281
Saury	197	406	135	221	105	253
Squids & Cuttlefishes other than common Squid	135	132	135	153	190	248
(Cuttlefishes)	(15)	(12)	(17)	(15)	(20)	(18)
Anchovy	370	335	287	245	217	245
Atka Mackere1	180	115	143	115	229	235
Common Squid	464	347	335	378	301	234
Shortneck Clams	116	114	138	122	135	135
Sandlance	195	194	300	275	224	137
Bigeye Tuna	98	105	102	113	115	128
Salmon	120	136	132	159	126	116
(Chums, Sockeyes, Cohoes, Springs)	(84)	(82)	(97)	(110)	(93)	(77)
(Pink and cherry salmon)	(35)	(54)	(35)	(49)	(33)	(39)
Scads	42	55	50	50	79	98
TOTAL MAJOR SPECIES (A)	6,771	7,092	6,992	6,952	6,887	7,145
TOTAL MARINE LANDINGS (B)	10,048	10,584	10,629	10,346	10,455	10,556
(A)/(B) x 100%	67	67	66	67	66	68

temporarily depressed the demand even for preferred species until consumers grew accustomed to the higher levels. Nonetheless, in spite of occasional reversals in response to sharp price escalations the trend toward preferred species is likely to continue.

As consumers continue to eat lower quantities of higher-priced fish and, at the same time, eat more meat and poultry, it follows that per capita consumption of fish is not about to increase significantly in future. In fact, per capita fish consumption is likely to remain at current levels for some time - about 65 kg per capita net edible fish food. Based on the projected population of 118.7 million in 1981, rising to 122.3 million in 1985, projected total demand is as follows (in thousands of tonnes):

	<u>1981</u>	<u>1985</u>
Total demand	10,686	11,010
Net food fish	7,718	7,952

II. SUPPLY

Domestic

The latest available statistics for 1977 indicate that the extension of fishing limits has had no significant impact on total Japanese landings. In fact, compared to the peak in 1974 in which landings amounted to 10.80 million tonnes, the 1977 catch showed only a very slight decline of 3.7% to 10.76 million tonnes and is still significantly higher than 8.7 million tonnes in 1965.

The major fish species (shown in Table II-1) consistently account for two-thirds of the marine species landed by the Japanese. Of these, the species which show a definite decline in volume between 1972 and 1977 are Alaska pollock (down 36%), common squid (a decline of 49%) and sandlance (a drop of 30%). Of these three species, only Japanese supplies of Alaska pollock can definitely be identified as falling victim to the 200-mile zone limit since the sharpest drop occurred between 1976 and 1977 included skipjack (down 4%), flatfishes (down 18%) and salmon (a drop of 8%). With the exception of skipjacks, the reduced landings reflect restrictions placed on the Japanese by other nations in their own 200-mile zones. Japanese forecasts are apparently not available for future landings. Indeed, officials of the Fisheries Agency indicated that such projections are nearly impossible since much of the Japanese landings consist of pelagic species which roam relatively freely. In the absence of Japanese data, landings forecasts have been made by the Canadian Study Team based on subjective evaluations of current trends and relevant factors. Japanese landings, divided into areas of catch, are shown in Table II-2.

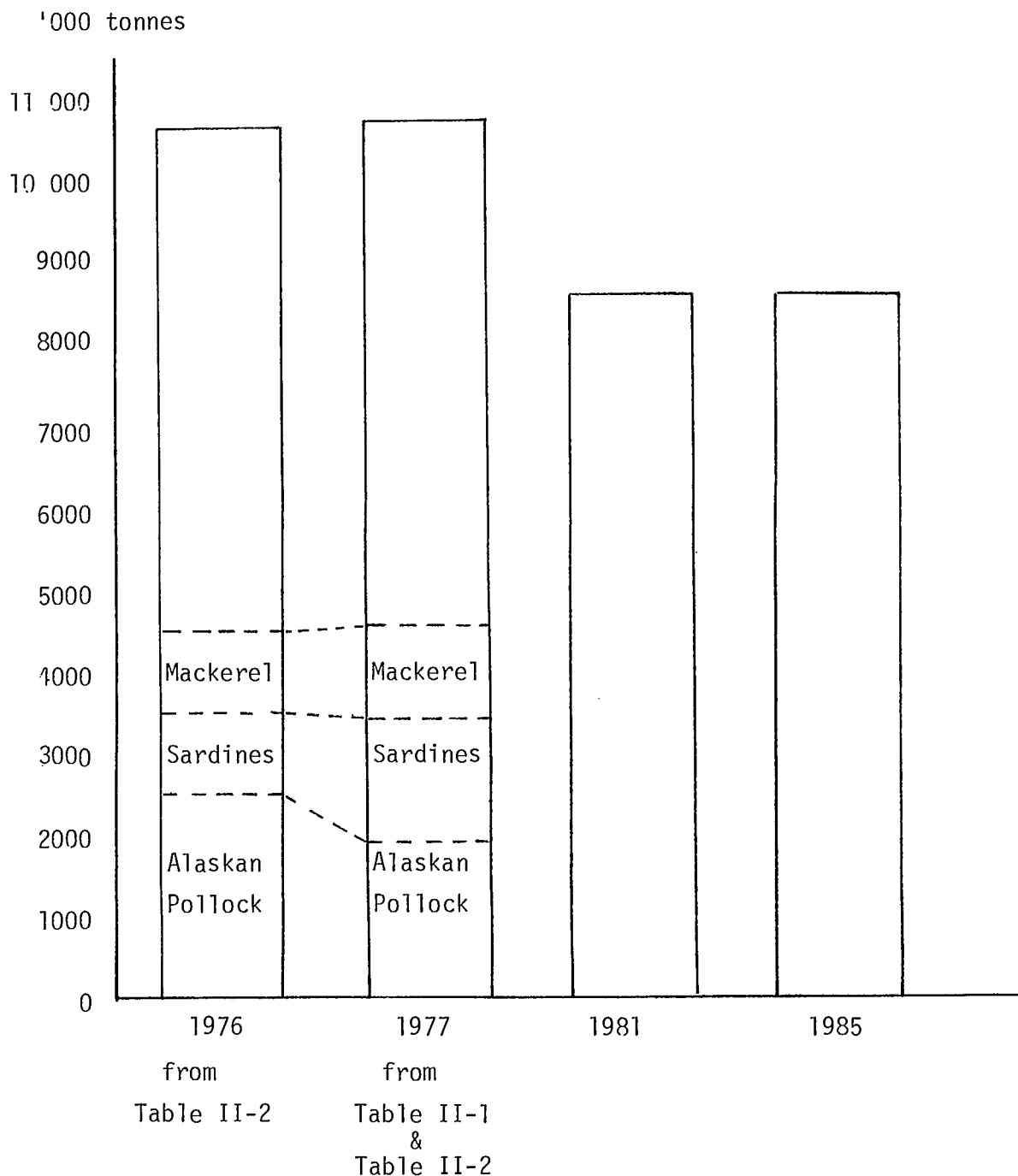
Judging from Table II-2, it is clear that access to foreign fishing zones is critical to the Japanese achieving and maintaining a reasonably stable level of domestic catch. Foreign zone landings represent the second most important source of fish landings and in 1976, for example, accounted for 32.9% of the total catch. Even so, supplies from foreign zones are declining and between 1974 and 1976 dropped 17% in volume. While it is unreasonable to assume that volumes will continue to decline until foreign zone landings disappear, it is extremely difficult to determine at what level they will stabilize.

TABLE II-2
LANDINGS BY CATEGORIES

	<u>1974</u>		<u>1975</u>		<u>1976</u>		<u>1981</u>		<u>1985</u>	
	'000 Tonnes	%	'000 Tonnes	%	'000 Tonnes	%	'000 Tonnes	%	'000 Tonnes	%
Total Landings	10,808	100.0	10,545	100.0	10,656	100.0	8,650		8,650	
Marine Fishery - Total	9,749	90.2	9,573	90.8	9,605	90.1				
Foreign zone landings	4,256	39.4	3,744	35.5	3,596	32.9	2,050		2,050	
Own zone landings	5,236	48.4	5,503	52.2	5,682	53.3	5,000		5,000	
High seas	257	2.4	326	3.1	417	3.9				
Freshwater Fishery	112	1.0	127	1.2	124	1.2				
Aquaculture	947	8.8	844	8.0	927	8.7			1,000	
Marine	880	8.1	772	7.3	850	8.0				
Freshwater	67	0.6	72	0.7	77	0.7			100	

CHART 2

JAPAN - TOTAL LANDINGS



$$\frac{10656 - 10455}{10455} = 0.0192$$

$$10556 \times 1.0192 = 10759$$

The U.S.A. and USSR zones account for the major portion of foreign zone supplies - about 74% of the total catch in foreign zones (see Table II-3). Allocations for Japan in 1978 and 1979, as shown in the same table have fallen sharply. By the end of 1979, the Japanese catch in the U.S. zone will have fallen to 1.1 million tonnes from 16 million tonnes in 1974, a drop of 31%, while declining even more sharply by 56% to 0.7 million tonnes in the USSR zone.

TABLE II-3
JAPANESE LANDINGS IN FOREIGN ZONES
('000 metric tons)

	<u>1974</u> <u>Estimated</u> <u>Catch</u>	<u>1975</u> <u>Estimated</u> <u>Catch</u>	<u>1976</u> <u>Estimated</u> <u>Catch</u>	<u>1978</u> <u>Allocation</u>	<u>1978</u> <u>Allocation</u>
U.S.A.	1,585	1,410	1,348	1,174	1,105
Canada	26	21	25		13
USSR	1,630	1,396	1,229	850	750
P.R. China	180	152	118		
North & South Korea	209	241	207		
Australia	18	12	18		
New Zealand	78	80	166		
Others	530	432	395		

The major concern of the Russians appears to be to strike a bilateral balance with the Japanese in their respective zones. As of 1979, the balance favours Japan by 100,000 tonnes. The marketing study assumes that by 1981 Japanese landings will be reduced by

100,000 tonnes to hold at 650,000 tonnes.

The U.S. situation is entirely different since there are no U.S. fishermen in Japanese waters. Based on 1978 and 1979 allocations, the yearly rate of decline of Japanese catch in U.S. waters appears to have levelled off at about 5% a year. Assuming this trend continues, the Japanese catch in the U.S. zone in 1981 is expected to be about 1 million tonnes and if supply conditions stabilize it is likely that the 1981 level will be maintained.

The Japanese are expected to encounter difficulties in gaining access to other foreign zones as pressures continue on all governments to conserve national fishing grounds. This study assumes that such pressures will curtail Japanese landings in these areas in the 1980s to about 400,000 tonnes. Forecasts for the total Japanese foreign zone landings, by region, are as follows:

	<u>1976</u>	<u>1981</u>	<u>1985</u>
Total Foreign Zone Landings	3,506	2,050	2,050
USSR	1,229	650	650
USA	1,348	1,000	1,000
Other	929	400	400

Another important variable in calculating total landings is the catch from Japan's own 200-mile zone. It is a component in the forecast which, while often overlooked, is nonetheless of great importance. As shown in Table II-2, landings within 200 miles of

Japan's coast exceed 5 million tonnes and have been increasing. Much of the increase, however, is due to such species as sardines for which landings jumped in volume more than 200% between 1974 and 1976. Since the catch of sardines and other pelagic species are subject to wide fluctuations, projections are difficult; but the continued downward trend in such major fishery catches as squid and salmon will tend to depress total landings. As a result, landings in the Japanese zone in the 1980s will likely hover around 5 million tonnes, slightly lower than in the past.

Judging from current trends, increases are forecast for aquaculture production, to perhaps about 1 million tonnes by 1985, the high seas catch to about 0.5 million tonnes; and freshwater fish landings stabilizing at 0.1 million tonnes for a total from these sources of 1.6 million tonnes. The total Japanese landings from all sources for 1981 and 1985 are estimated at 8.65 million tonnes. An assessment of the domestic picture by species follows below and in Table II-4.

(1) Alaska Pollock

In terms of landings, Alaska pollock is the single most important domestic species. In 1977, despite lower volumes resulting from restrictions in foreign zones, pollock accounted for 18% of the total Japanese catch. As Table II-5 indicates, the Japanese are heavily dependent on the catch in foreign zones for pollock supplies and, consequently, their ability to negotiate access to foreign waters will play a significant role in

TABLE 11-3

JAPANESE LANDINGS BY SPECIES OF INTEREST TO CANADA

('000 tonnes)

		<u>1976</u>	<u>1977</u>	<u>1981</u>	<u>1985</u>
<u>Less Preferred Species</u>					
Cod (Pacific)	1	90	85		
Turbot	6	-	-	-	-
Halibut	2	-	-	-	-
Pollock	3	2,445	1,931	3,000	3,000
Hake	6				
<u>Flatfishes (exclusive of Bastard Halibut)</u>					
Grenadier	6				
Red Fish	6				
Mackerel		979	1,355		
Herring		66	20		
<u>Preferred Species</u>					
Bastard Halibut		7	6		
Capelin		Negligible	Negligible		
Salmon	7	126	116		
Squids & Cuttlefish (Total)		491	483		
Common Squid		301	234		
Cuttlefishes		20	18		
Other		170	230		
<u>Lobster</u>	5	1	1		

TABLE 11-3 (continued)

	<u>1976</u>	<u>1977</u>	<u>1981</u>	<u>1985</u>
<u>Crabs</u>	76	66		
King Crab	2	1		
Tanner Crab	24	22		
Blue Crab	4	3		
Other	46	40		
<u>Shrimps and Prawns</u>	58	52		
<u>Other Sellfish</u>	566	N/A		
Sea Urchins	23	27		
Abalone	6	5		
Common Spiny Whelk	10	10		
Hard Clams	4	5		
Shortneck Clams	136	155		
Hen Clams	3	4		
"Mogai" Clams	11	6		
Oysters	226	N/A		
Others	147	117		

- Notes:
1. Primarily Pacific Cod (*Gadus Macrocephalus*).
 2. Includes Flounders, Soles and Halibut.
 3. Alaska Pollock (*Theragra Chalcogramma*)
 4. Minimal Domestic Catch. Included in other species.
 5. Not Atlantic Lobster but Japanese Spiny Lobster (*Panulirus Japonicus*).
 6. Landings of these species, if any, are included in "Other Finfish".
 7. Does not include chum landings in freshwater.

determining future landings. It is clear that both the Japanese catch and foreign allocations have been declining steadily. Such a trend is expected to continue and, by 1981 and 1985, the catch in foreign zones will likely fall to 1 million and 0.9 million tonnes respectively. On the assumption that the total Japanese Alaska pollock landings will fall correspondingly, landings could amount to 1.7 million tonnes in 1981 and 1.6 million tonnes in 1985. If such forecasts materialize, they will be 43-47% below the peak volume of 3 million tonnes in 1972 and 1975.

A major product of the Alaska pollock fishery is the roe (tarako). Tarako production in Japan between 1972 and 1976 varied between 4,000 tonnes and 47,000 tonnes per year, representing about 1.7% of the Alaska pollock landings for the year. Based on this rate of yield and 1977 landings of some 1.9 million tonnes, 1977 production would be around 33,000 tonnes, a significant decline from 41,000 tonnes in 1976. On the basis of projected 1981 and 1985 landings, future tarako output is estimated at 30,000 and 28,000 tonnes respectively thereby creating demand for imports.

(2) Flatfish

As indicated by the 1976 landings, flatfishes are consumed in significant quantities in Japan. Of the total volume of 352,000 tonnes of flatfish, slightly less than one-third was caught in foreign zones, mainly in waters off the United States (81,000 tonnes) and the USSR (26,000 tonnes). Neither the USSR

TABLE II-5

COD & POLLOCK						
	1976	1977	1978	1979	1981	1985
Total Catch ('000 tonnes)	2,535	2,016	1,961	1,864	1,780	1,650
Alaska Pollock	2,445	1,931	1,916	1,525	1,750	1,650
Pacific Cod	90	85	45	39	30	0
Foreign Zone Landings ('000 tonnes)	2,143	1,265	1,201	1,114	1,030	900
Alaska Pollock	2,073	1,181	1,166	1,075	1,000	900
Pacific Cod	70	84	45	39	30	0
Imports (tonnes)						
Pollock, Hake and Cod	7,654	11,216	9,002			
USSR	6,828	8,039	8,413			
South Korea	552	1,463	318			
Canada	-	52	103			
Roe (Fresh, frozen, Salted) (Tonnes)	4,597	4,302	6,773			
USSR	2,944	3,100	2,779			
South Korea	1,432	508	1,498			
North Korea	164	378	1,882			
Norway	1	34	323			
Canada	65	-	40			

nor the US have seriously cut back Japanese allocations - 179,000 tonnes in 1979 compared with 194,000 tonnes. Assuming that the Japanese can continue to land about 200,000 tonnes in their own waters, significant short-falls in supply are not expected.

(3) Herring

Herring in Japan is used primarily in dried form known as migaki of which Japan consistently produced about 19,000 tonnes annually between 1971 and 1976. In 1977 production fell to 17,000 tonnes, reflecting a drop in raw material supplies. A further decline is expected in the domestic herring catch, stabilizing at about 14,000 tonnes for the 1980s, thereby leaving Japan dependent on imports to fill the gap in anticipated consumer demand.

(4) Salmon

The peak year for Japanese salmon landings occurred in 1975 when the industry landed 159,000 tonnes. Since then the catch has declined steadily to 116,000 tonnes in 1977. As can be seen from Table II-6, salmon landings in foreign zones were virtually nil in 1978. Salmon fishing in the high seas is still an issue, however, and it is quite possible that further catch reductions may be imposed on the Japanese.

TABLE II-6

SALMON

	1976	1977	1978	1979	1981	1985
Total Catch ('000 tonnes)	126	166			90	90
Foreign Zone Landings	18					
Imports (tonnes)						
Salmon	3,665	19,279	49,737			
USA	2,360	14,834	40,834			
Canada	322	3,701	7,037			
Salmon Roe	5,773	6,682	7,803			
USA	4,473	5,554	6,319			
Canada	1,298	1,110	1,474			

(5) Cod

Cod is a relatively minor species in Japan and the largest catch in recent years, in 1973, was only 108,000 tonnes. Even at this level, cod landings accounted for only about 1% of the total catch for the year. Japanese cod landings depend almost entirely on access to foreign zones and from Table II-5 the risks of foreign dependence are all too clear. Japanese allocations in the U.S. and USSR zones have been declining from 70,000 tonnes in 1976 to 39,000 tonnes in 1979. Since Pacific cod can be marketed in both the U.S. and USSR, it is conceivable that the Japanese catch may be forced down to zero by 1985, thus generating a shortfall of 90,000-100,000 tonnes.

(6) Mackerel

Japanese mackerel landings (see Table II-1) have been hovering around 1.2 to 1.3 million tonnes and although 1976 landings fell below 1 million tonnes, the 1977 catch rebounded to 1.3 million tonnes. Since the Japanese are not dependent on foreign zone landings for mackerel, the current volume of domestic catch can be expected to continue.

(7) Squid and Cuttlefish

The present status of the squid supply is summarized in Table II-7. In addition, as the "Report of the Fisheries Technical Mission to Japan September 23 - Oct, 5, 1978" contains a relevant discussion on the Japanese squid market, the appropriate section of the report has been annexed to this market study.

TABLE II - 7

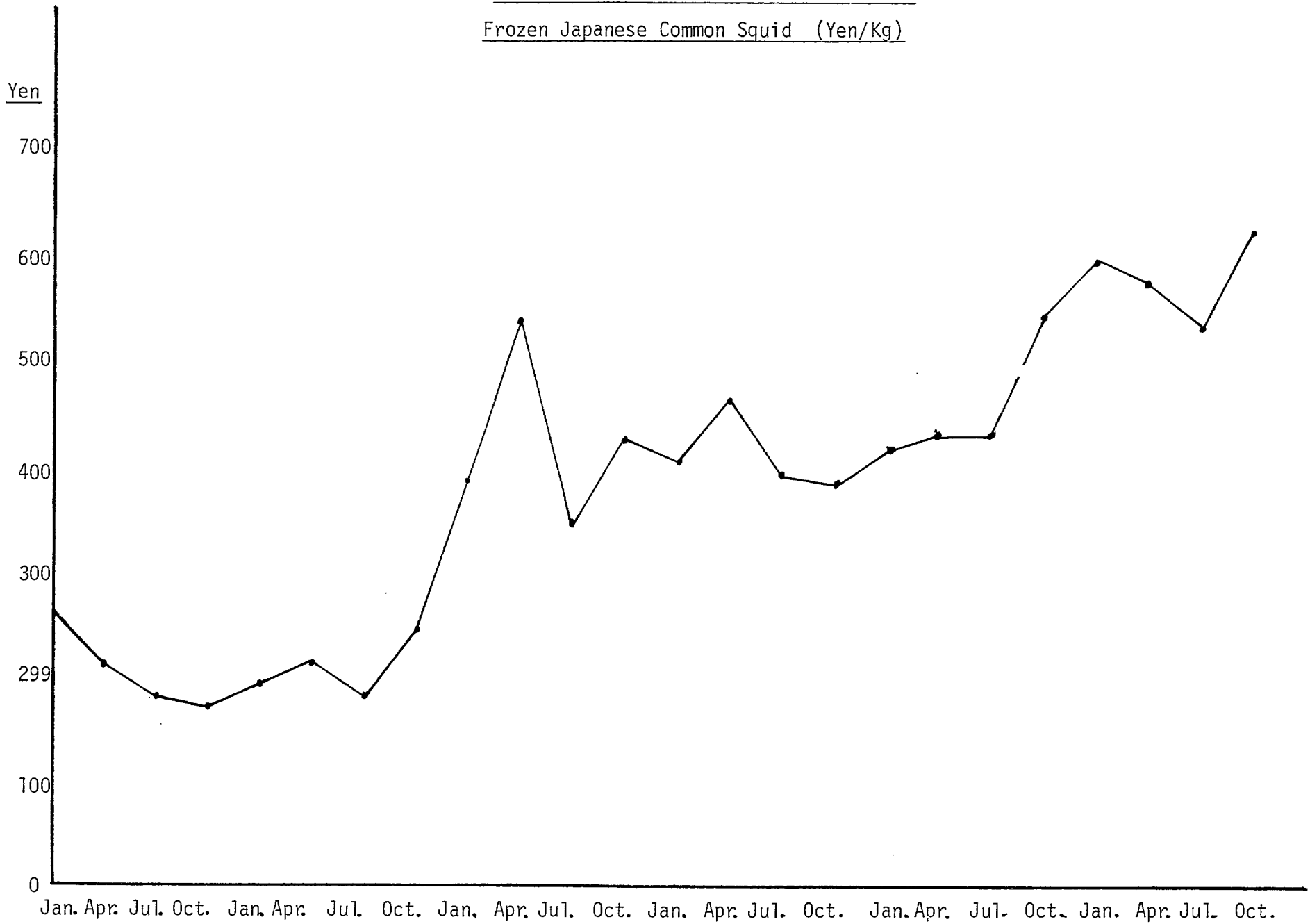
SQUIDS & CUTTLEFISH

	1976	1977	1978	1979	1981	1985
Total Catch ('000 tonnes)	491	482			300	300
Common squid	301	234				
Cuttlefish	20	18				
Other squids & cuttlefishes	170	230				
Foreign Zone Landings ('000 tonnes)	202	228	290	290	150	150
Imports						
Frozen (tonnes)	68,533	74,752	118,142			
South Korea	21,760	19,935	27,488			
Canada	3,116	7,423	27,156			
Spain	7,691	7,780	13,592			
Thailand	7,524	8,250	10,121			
Argentina	752	27	9,825			
Salted or Dried	714	1,347	1,594			
Thailand	553	845	1,020			
South Korea	152	373	568			
Canada	-	5	3			

Domestic squid landings have been declining since 1968 - a record catch year of 774,000 tonnes - and by 1976 the catch had fallen 36% to 491,000 tonnes. In 1977, squid landings continued to diminish largely as a result of smaller catches of common squid (*Todarodes pacificus*) which slipped by 22% between 1976 and 1977 to 234,000 tonnes. In the 1967-76 period the drop of common squid landings - by a hefty 55% - outpaced the overall decline in squid supplies, a point of some concern to the Japanese. Preliminary data indicate that 1977 landings of common squid were even lower at 297,000 tonnes. The decline in common squid landings is all the more dramatic because it has occurred despite the inclusion of New Zealand squid from 1972 and of "murasaki" squid (*Omastrephes bartrami*) since 1975. On the other hand, consumer demand for squid has remained strong at some 400-450,000 tonnes per year even though declining landings and strong demand have combined to push up prices sharply. The average wholesale price for common squid (see Chart 4) began to rise very rapidly during the last few months of 1973 when it became clear that landings of common squid would be significantly lower. Although average annual prices between 1972 and 1973 increased only by about 10%, the December average jumped by 77% over the same month in 1973. Prices continued to rise in 1974 on the knowledge that landings would drop further and the average price for the year recorded rose by nearly 85% from the previous and 104% over 1972. While the rate of price increases has slowed significantly since 1974, the pace is still faster than for most other species. As of 1977, the average price was yen 562/kg or 171% higher than the level in 1972.

CHART 4

CHANGE IN WHOLESALE PRICE 1972 - 1977
Frozen Japanese Common Squid (Yen/Kg)



(8) Shrimps and Prawns

Domestic landings of shrimp and prawns fill less than half of the Japanese market demand for these delicacies. In future, domestic production is likely to account for even less of the total. In 1977, Japanese fishermen landed 52,000 tonnes of the 144,000 total market and the industry is expected to hold its output at about 50,000 tonnes annually.

III. POTENTIAL

Japan ranks high as a dynamic export market for Canada. Aside from its natural potential as a densely populated island-bound nation which enjoys fish as an essential food product, Japan is becoming increasingly dependent on imported fish supplies. Between 1976 and 1978 alone, the value of Canadian fish exports to Japan more than tripled from \$77.5 million to \$245.4 million, according to Statistics Canada. By the early 1980s, the value of exports could easily rise to \$500 million especially if the FAO is correct in its forecast that Japan will become the world's number one seafood importer by 1985. In the next decade, Canada is in a good position to make more export mileage out of Japan's growing reliance on imports. In this respect, the recently concluded multilateral trade talks have laid the base for wider entry of Canadian fish products to Japan. Among the first tariff cuts - which on the whole dropped by an average of 30-50% - are the following:

- frozen herring and cod, frozen hard roe, 10% down to 6%;
- dried and salted herring roe, 15% down to 12%;
- frozen and fresh squid, 10% down to 5%.

In future, as Canadian exporters capitalize further on rising Japanese demand and the new trade opportunities presented by lower tariffs, it is probable that Canada-Japan fishing trade relations could grow even closer together. Since the mid-1960s, Japan has taken an even larger share of Canadian fish exports and now buys about one-fifth of the total. Given the present climate, the bilateral link could strengthen, especially as Japan has shown considerable interest in developing joint venture arrangements with foreign suppliers including Canada.

Promising developments for Canadian exporters are clearly possible even though constraints of the 200-mile fisheries zone on Japanese supply and demand will not be as severe as predicted earlier. On the supply side, some of the potential losses may be minimized by successful Japanese negotiations to regain access to foreign fishing waters. In addition, the greater control of its own coastal fisheries undoubtedly will be below levels earlier this decade. On the demand side, factors unassociated with 200-mile limit jurisdiction have prompted a reassessment of future consumption patterns. A combination of trends, including Westernization, urbanization and higher living standards all work against increased demand for fish. From the current supply and demand forecasts, a shortfall in supply is anticipated in both 1981 and 1985:

	<u>1981</u>	<u>1985</u>
	('000 tonnes)	
Total catch	8.65	8.65
Total demand	10.67	11.01
Shortfall	2.02	2.36

The present forecast is lower than earlier projections of a shortfall of 4-5 million tonnes which had assumed that 40% of Japan's fish catch lay in foreign fishing zones.

In an effort to analyze the best opportunities for Canadian exports, the Japanese catch data have been re-grouped to highlight these species of interest to Canada. (See Table III-1). Canadian export potential is indicated in Table III-2.

As shown in the table, species have been classified according to consumer preference. For the less-preferred group, such as groundfish, mackerel and herring, it appears that demand is not expected to increase. Therefore, if shortfalls in supply occur it will probably be as a result of a drop in landings. By contrast, demand is certain to rise for preferred species, including salmon, capelin, squid, cuttlefish and a variety of shellfish and molluscs. An analysis of individual species begins below.

(1) Alaska Pollock

When taken against the projected landings for 1981 and 1985, the anticipated shortfall is approximately 1.8 million and

TABLE III-1

SUMMARY OF IMPORT POTENTIAL
('000 Tonnes)

	<u>Actual</u> <u>1978</u>	<u>1981</u>	<u>1985</u>
<u>Alaska Pollock</u>			
Landings		1,750	1,650
Requirement		2,800	2,800
Potential Import (1978 import includes cod and hake)	9	1,050	1,150
<u>Alaska Pollock Roe</u>			
Production		30	28
Requirement		40	40
Potential import	7	10	12
<u>Cod</u>			
Production		30	0
Requirement		100	100
Potential Import		70	100
<u>Herring</u>			
Production		14	14
Requirement		75	75
Potential Import	7	61	61
<u>Herring Roe</u>			
Production		90	90
Requirement		200	200
Potential import	50	110	110
<u>Salmon Roe</u>			
Production		1.6	1.6
Requirement		10.0	10.0
Potential import	7.8	8.4	8.4
<u>Capelin</u>			
Production		-	-
Requirement		15	15
Potential Import	8	15	15

TABLE III-1 (continued)

SUMMARY OF IMPORT POTENTIAL

('000 Tonnes)

	<u>Actual 1978</u>	<u>1981</u>	<u>1985</u>
<u>Squid and Cuttlefish</u>			
Production		300	300
Requirement		583	605
Import Requirement	120	283	305
<u>Shrimps & Prawns</u>			
Landings		50	50
Requirement		206	212
Potential Import	144	156	162

TABLE III-2

CANADIAN EXPORT POTENTIAL TO JAPAN: 1981/1985

Speices	1981	1985	Assumptions
Pollock	3,000	3,000	<ol style="list-style-type: none"> 1. Canadian catch is available. 2. Canadian capability to process 3,000. 3. Decline of Canadian exports to U.S. as U.S. production increases.
Pollock roe	60	60	<ol style="list-style-type: none"> 1. One-half of the forecast pollock landings are available for roe processing. 2. Yield rate of 4%
Herring	30,000	30,000	<ol style="list-style-type: none"> 1. Tougher U.S.S.R. restrictions on Japanese access. 2. Increased U.S. herring exports, causing increased competition for Canada. 3. Resumption of European herring catch by 1981. 4. Japanese import quotas no barrier.
Herring roe	5,000	5,000	<ol style="list-style-type: none"> 1. Canadian fishery stable around 450,000 T. 2. Yield rate of 11-12%. 3. Japanese demand stable. 4. No significant development of East Coast herring roe industry. 5. U.S./Chinese catch stable, thus no increased competitive threat.
Salmon	22,000	30,000	<ol style="list-style-type: none"> 1. Canada accounts for 25% of Japanese imports by 1985. 2. 1981 figure based on annual increments to 1985.
Salmon roe	2,800	2,800	<ol style="list-style-type: none"> 1. Projected from current Canada/U.S. ratio.
Capelin (female only)	7,000	7,000	<ol style="list-style-type: none"> 1. Icelandic and Norwegian fisheries to remain poor. 2. Development of processing capability by 1981.
Squid	76,000	90,000	
Shrimp and Prawns	2,000	2,000	<ol style="list-style-type: none"> 1. U.S. shrimp market to remain strong. 2. Current Canadian production (10,000 t) is not expected to increase.

1.9 million tonnes respectively for Alaska pollock. It is an important raw material for surumi, or fish paste, in turn used to produce fish cake products (kamaboko, chikuwa).

As Table III-3 indicates, slightly over 50% of the total supply of Alaska pollock is utilized for surumi production. The first significant fall in output of surumi occurred in 1977 when supplies fell by 10% from 444,000 tonnes in 1976 to 389,000 tonnes. Landings declined in the same year by some 21% to 1.9 million tonnes from 2.4 million tonnes in 1976. Assuming that the annual requirement for surumi is about 400,000 tonnes - with a yield of 25% - the quantity of Alaska pollock required for surumi is approximately 1.6 million tonnes.

As for tarako (pollock roe), declining domestic supplies and prospects for further reductions have already caused spiralling prices and a fall in consumption. Statistics show that per capita purchases of tarako have declined from 296.9 grams in 1975 to 220.4 grams in 1977. Although complete 1978 data are not yet available, indications are that per capita purchases are on average about 78% of 1977 levels. It is not yet clear at what volume the decline will stabilize especially given a 30% drop in domestic supplies between 1973 and 1977. Nevertheless, if forecast domestic supplies drop even further to 28,000 tonnes by 1985, significant potential exists for exporters to this market.

TABLE III-3

UTILIZATION OF ALASKA POLLOCK
(Quantity in '000 Tonnes Round Weight)

Fresh	92	3.4	258	8.5						
Plain dried	38	1.4	37	1.2	42	1.3	54	1.8	45	1.5
Salted & Dried	13	0.4	11	0.3	10	0.3	12	0.4	24	0.8
Sukimi	78	2.9	66	2.1	61	1.9	63	2.1	55	1.9
Salted Cured	27	1.0	37	1.2	23	0.7	22	0.7	28	0.9
Prepared	66	2.4	73	2.4	126	4.0	89	3.0	93	3.2
Frozen Surumi	1,278	47.2	1,391	45.8	1,510	47.9	1,346	46.2	1,406	49.4
Fresh Surumi	100	3.6	139	4.5	107	3.7	125	4.2	125	4.3
Fish meal	<u>1,013</u>	<u>37.4</u>	<u>1,022</u>	<u>33.6</u>	<u>1,267</u>	<u>40.2</u>	<u>1,149</u>	<u>41.0</u>	<u>1,069</u>	<u>37.5</u>
Total	2,707	100.0	3,035	100.0	3,147	100.0	2,908	100.0	2,845	100.0

Fresh product is probably used for the production of fillet blocks intended primarily for export to the U.S. and can be eliminated from Japanese domestic requirements. After deleting the fresh product component, the annual requirement for other food products appears to be relatively small - about 250,000 tonnes. In addition, about 1 million tonnes is used for fish meal. Thus, the total domestic requirements is about 2.8 million tonnes.

(2) Flatfish

Most consumption appears to be in the fresh form although there are also dried and marinated/pickled forms of flatfish as well. But, as most flatfishes with the exception of Bastard Halibut are viewed as less preferred species, consumption is not expected to increase. Another segment of the flatfish market - roe bearing flatfish - also presents some potential for exporters. This type is very much in the preferred category and prices apparently are in the order of 10 times those without roe. These are normally sold as fresh slices with the fish cut in such a way that each slice contains a portion of the roe. With such a possibly lucrative price, Canada should investigate the feasibility of this fishery.

(3) Herring

Herring, particularly the food herring market in Japan, received considerable attention in 1977 when the Japanese engaged in intensive buying abroad. Japanese imports that year

jumped to 31,000 tonnes compared to 6,000 tonnes in 1976 (Table III-4). A principal cause of the sudden jump in imports in 1977 was an impending threat by the USSR to close its herring grounds to the Japanese. While a partial closure did indeed occur, causing a drop in landings to 20,000 tonnes from 66,000 in 1976, the sharp increase in prices curtailed domestic consumption so that a significant portion of herring imports remained unused. In the face of high inventory levels, 1978 imports fell to more traditional levels of 7,000 tonnes.

The USSR herring incident is a lesson for Canadian exporters eyeing the Japanese market. Consumer reaction to sharp price increases, as well as supplies from traditional sources, can shift dramatically from one year to the next. Therefore, an exporter looking for new opportunities would be wise to respond as quickly as possible to make the most of sudden market needs.

In future, exporters have an opportunity to fill increasing quantities of raw material demand for food herring. But there is a big "IF". That is, if consumer demand stabilizes for migaki - the major end-use for food herring in Japan.

Consumption of food herring in other forms is minimal so that, without continued demand for migaki, the market for food herring would be of little importance. Traditionally the raw material for the product came from Japan's domestic herring landings and imported roe herring carcasses. But declining domestic herring landings and restrictions in foreign supplies

TABLE III - 4

HERRING

	1976	1977	1978	1979	1981	1985
Total Catch ('000 tonnes)	66	20	16	16	14	14
Foreign zone landings ('000 tonnes)	49	6	2	2	0	0
Imports (tonnes)						
Herring	5,910	30,600	6,926			
Canada	4,500	21,392	1,122			
USA	996	8,691	5,401			
Roe	12,867	10,679	9,988			
Canada	7,810	9,162	7,960			
USA	1,202	719	670			
P.R. China	1,445	397	700			
South Korea	1,360	377	636			

including Canadian reduction of allowable round roe herring exports from 25% of landings to 5%) have severely restricted the available supply. On the other hand, rapid increases in prices depressed the demand for migaki so that the shortfall in supply is less than it might have been. If demand for migaki stabilizes at about 15,000 tonnes, the total requirements would be about 75,000 tonnes assuming a product round ratio of 20%. In addition, if domestic herring landings settle at about 14,000 tonnes, another 61,000 tonnes would have to come from imports. As previously noted, Canada could supply 2,000-3,000 tonnes of herring roe carcasses, based on 5% of landings estimated between 40,000 and 60,000 tonnes.

Another major herring product is the roe itself. The future of this market is of critical importance to the B.C. fishery as for a number of years it has been the largest supplier in Japan, accounting for nearly 80% of Japanese imports of herring roe in 1977. For its own part, Japan is now completely dependent on imports for its supply of roe so that consumption trends will be influenced by the availability of foreign supplies and prices charged. Given these market conditions, Canada can expect to export all its roe production to Japan without much difficulty.

(4) Salmon

Confronted by supply constraints and rising prices, the Japanese are anxious to maintain their supply of salmon. In 1978, imports accounted for 37% of the total supply compared to

only 5% in 1975 (see Table III-5). Of the 1978 imports, 60-70% consisted of sockeye as it was cheaper than the domestic product. Interest in other salmon species, particularly chum and pinks, is expected to increase in 1979 and subsequent years as domestic landings of these species continue to decline.

TABLE III-5
TOTAL SUPPLY OF SALMON BY SOURCE
('000 tonnes)

<u>YEAR</u>	<u>DOMESTIC LANDINGS*</u>	<u>IMPORTS</u>			<u>TOTAL IMPORTS</u>	<u>TOTAL SUPPLY</u>
		<u>USA</u>	<u>CANADA</u>	<u>OTHER</u>		
1975	134.4	4.7	1.0	1.1	6.8	137.2
1976	109.3	2.4	0.3	1.0	3.7	113.0
1977	96.3	14.9	3.7	0.7	19.3	115.6
1978	84.0	40.9	7.0	1.8	49.7	133.7

*Note: Salmon landed and processed on factory ships and carryover from the previous year are not included. Data for this portion of the domestic catch is not available for all years but amounted to 32,000 tonnes in 1976 and 23,000 tonnes in 1977.

On the demand side, one estimate by a major fishing company places total annual consumption at about 150,000 tonnes. However, according to the 1976 annual survey of household expenditures, consumption per household is 1.4 kg for fresh salmon and 3.4 kg for salted salmon. Based on 34 million households, this implies a consumption

of 115,000 tonnes product weight. Assuming rates of yield of 60%, 75% and 70% for fresh, light salted and salted products, round weight equivalents are estimated at 78,000 tonnes for fresh and 150,000 tonnes for salted salmon. In addition, the canned industry in 1976 produced some 24,000 tonnes (net product weight) which requires about 60,000 tonnes of round salmon. If all these are added the total market would be around 290,000 tonnes - much higher than the industry estimate. Clearly, the figure is out of line but even assuming a total market of 20,000 tonnes - between the two extremes - there will be substantial scope for imports. If the Japanese maintain their domestic landings at 90,000 tonnes (assumes "mothership" factory-freezer trawlers operations will be phased out) there is a potential shortfall of some 110,000 tonnes. This estimate may not be far off the mark since some Japanese importers estimate that 1979 imports may climb to 80,000 tonnes (Canadian Pacific salmon landings in 1978 amounted to 70,604 tonnes).

Another bright sign for Canadian salmon exporters is the recent inauguration of salted salmon exports to Japan. While the trade was initiated partly as a means of circumventing a Canadian regulation restricting the export of frozen sockeyes and pinks, there is a more positive side to this development. A substantial market exists for salted salmon (see Table III-6) and potential opportunities for Canada should not be overlooked.

TABLE III-6
SALTED SALMON PRODUCTION
(Tonnes)

	<u>Shore Based Plants</u>	<u>Factory Ship Production</u>	<u>Total</u>
1972	40,326	42,315	82,641
1973	60,084	35,724	95,808
1974	52,216	26,828	79,045
1975	71,757	39,705	111,462
1976	57,123	20,973	78,096

The total market appears to be between 80,000 and 110,000 tonnes per year although the relationship between output from the factoryships and shore-based plants has reversed as domestic supplies of salmon dwindled through the late 1970s. Quite obviously there is a limit to the extent the shore-based plants can continue to offset the loss in the factoryship production. However, if factoryship production was eliminated completely it appears there is a potential import requirement for 20,000 tonnes of salted salmon.

From the Canadian point of view, a major export obstacle is the Canadian regulation which requires that all salted sockeye and pinks (other than number I) must contain no more than 54% moisture. All Japanese companies interviewed indicated that at this level the moisture content makes the product too salty for the Japanese market. No specific salt content standards appear to exist.

Among Japanese producers the salt content from offshore vessels reportedly varies between 10% and 30%. Offshore vessels without freezers salt the salmon relatively heavily at the beginning of the voyage and less so as the voyage progresses. Shore-based plants produce two types: about 50% of the output is a very lightly salted product known as aramaki and the rest is a more heavily salted product known as yama-zuke. Both products are frozen after salting to preserve flesh colour and to prevent over-curing. A further technical study of Japanese preferences and possible amendment of the Canadian regulation are required to exploit the salted salmon market.

Aside from salmon itself, roe is a major product. As a consequence of domestic supply difficulties, total Japanese production has fallen from a peak in 1975 of 3.7 million tonnes to 2 million tonnes in 1976 (see Table III-7). Assuming a total potential market of 10,000 tonnes, future landings of 90,000 tonnes and average yield of 1.8%, Japan will rely increasingly on imports to fill its domestic needs.

TABLE III-7
SALMON ROE SUPPLY
(tonnes)

	<u>DOMESTIC PRODUCTION</u>				
	<u>Shore-Based Plants</u>	<u>Factoryship Production</u>	<u>Total Domestic Production</u>	<u>Imports</u>	<u>Total Supply</u>
1972	1,782	219	2,001	4,852	6,853
1973	1,327	287	1,614	4,868	6,482
1974	2,519	243	2,762	4,335	7,097
1975	3,521	241	3,762	3,486	7,248
1976	1,808	260	2,068	5,773	7,841

(5) Cod

While there is very little information available on the consumption of cod, the bulk is sold fresh at the retail level and consumed in fish chowder type dishes. The demand is highly seasonal, peaking in winter and falling off in the warmer months. As cod is considered one of the less preferred species, present consumption levels are not expected to increase. However, there are still some opportunities for Canadian exporters. Because cod, Alaska pollock and hake are considered interchangeable, these relatively unfamiliar species which the Japanese now appear to be promoting may replace cod in future.

(6) Mackerel

Mackerel exports have very little potential for Japan since it is self sufficient. Canned and non-edible products (see Table III-8) account for the bulk of the market. In considering the potential for canned mackerel, it is important to remember that most of the production is exported. For example, of the 211,000 tonnes (product weight) and 184,000 tonnes produced in 1975 and 1976, 92% and 90% respectively were exported. It is unlikely that Canadian canned mackerel can be competitive in this market since consumers prefer seasoned canned products not made by Canada. In fact, Japan should be regarded as a competitor rather than a potential buyer in the mackerel market. The other major component of demand is the market for non-edible products. Given the price and the economics of scale it is doubtful again that Canada can compete.

TABLE III-8
UTILIZATION OF MACKEREL
('000 tonnes round weight)

Fresh	239	19.0	78	6.5	97	8.5	249	18.6	112	8.4
Salted and dried	40	3.1	35	2.9	42	3.7	43	3.2	44	3.3
Dried	124	9.9	149	12.5	126	11.0	146	10.9	143	10.8
Salt cured	74	5.8	63	5.2	38	3.3	55	4.1	62	4.6
Canned	477	38.0	475	39.8	458	40.3	448	33.6	471	35.7
Meal and feed	300	23.9	390	32.7	378	33.2	390	29.2	487	36.9
(fish flour)	(200)	(15.9)	250	(21.0)	(257)	(22.6)	(249)	18.7	(337)	(25.5)
(fish feed)	(100)	(7.9)	140	(11.7)	(120)	(10.5)	(140)	10.5	(150)	(11.3)
(live feed)	(neg)	(neg)	(neg)	(neg)	(neg)	(neg)	(neg)	(neg)	(neg)	(neg)
LANDINGS	1254	100.0	1190	100.0	1134	100.0	1331	100.0	1318	100.0

TABLE III - 9

CAPELIN

	1976	1977	1978	1979	1981	1982
Total catch	Not Available - Relatively small					
Foreign Zone Landings	Not available - Relatively small					
Imports (tonnes)	22,877	18,612	7,701			
Norway	6,203	4,733	1,375			
Iceland	5,263	4,654	183			
USSR	10,099	7,284	4,040			
Canada	92	369	1,292			

(7) Capelin

All imported and domestic capelin is consumed with the roe so that the supply is dependent on the vagaries of the foreign fishery. In 1978, for example, when the Icelandic and Norwegian capelin fishery failed, imports declined to 7,701 tonnes from nearly 19,000 tonnes in 1977 (see Table III-9).

The total Japanese market for female capelin is about 15,000 tonnes and though it is a preferred species it is also a specialty item of limited consumer interest. Therefore, demand for capelin is not expected to grow significantly beyond current levels. If, however, Iceland and Norwegian fisheries remain poor, the resulting shortfall in imports could create opportunities for the Canadian product.

(8) Squid and Cuttlefish

With a steady decline in domestic landings of squid since 1968, imports of frozen squid mushroomed to 118,000 tonnes in 1978 from 75,000 in 1977 - a 58% increase. Especially noteworthy is the role of Canadian exporters in filling the larger demand. Between 1977 and 1978, Canadian squid exports to Japan rose by 366% to 27,156 tonnes, putting Canada in second spot behind South Korea as a source of frozen squid.

Traditionally, Japanese squid imports were of high value such as "mongo" cuttlefish (*Sepia officinalis*) and "ko" cuttlefish (*Sepia esculenta*). In order to alleviate growing

shortages Japan began importing Atlantic squid (*Illex illecebrosus*) in 1976, principally from Canada. Between April 1977 and March 1978, an estimated 36,000 tonnes of Atlantic squid were imported, accounting for 50% of all squid imports in that period.

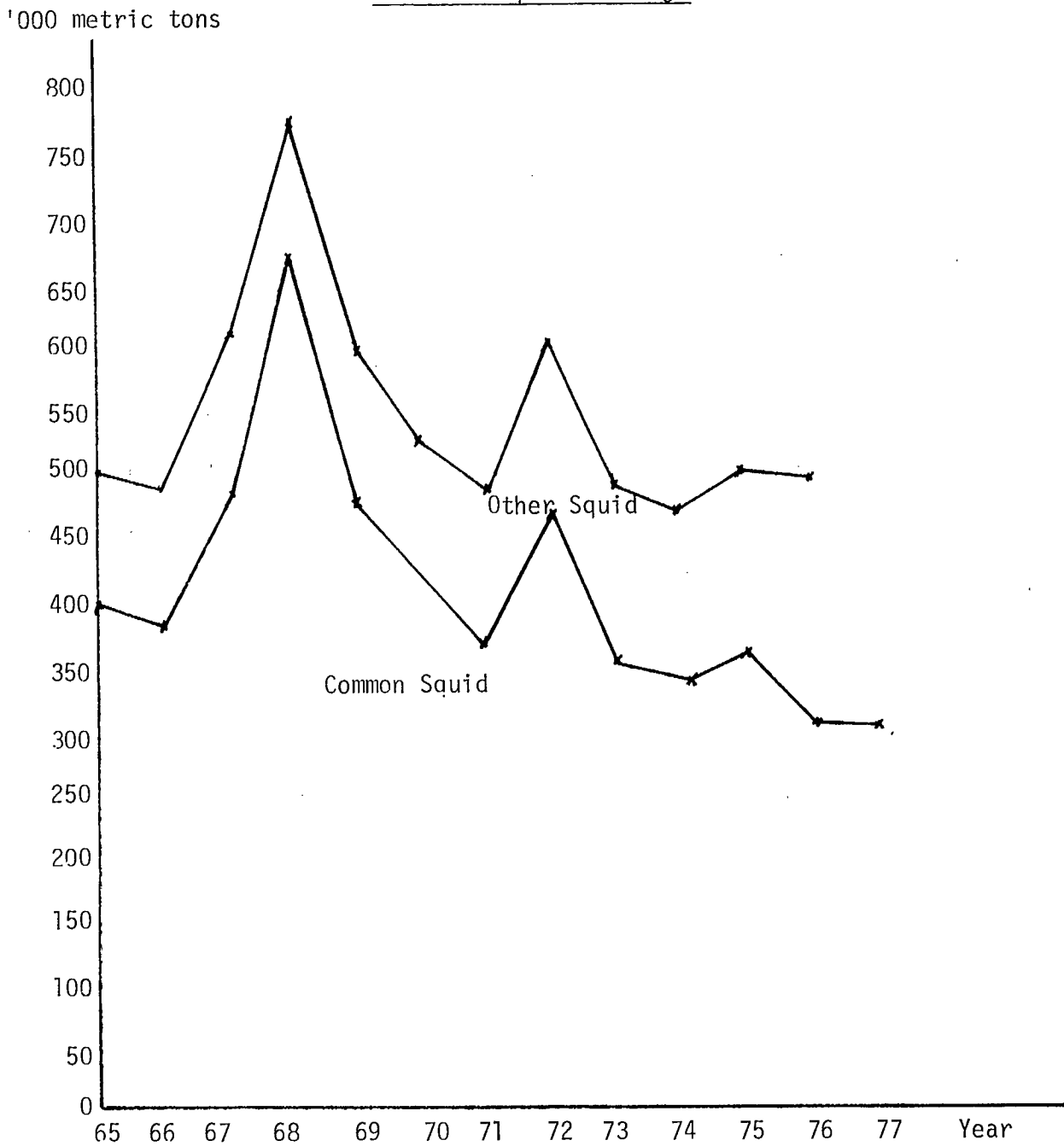
Recent demand trends, illustrated in Table III-10, show that fresh and prepared squid are the major and growing sectors, accounting for 80% of the market. While the total annual requirement, currently averaging about 550,000 tonnes, is largely dependent on domestic landings, import volumes have doubled from low levels in the early 1970s. In future, even if per capita squid consumption remains about the same, population increases may stimulate growth of total demand to 583,000 tonnes in 1981 and 605,000 tonnes in 1985. If domestic landings stabilize around 300,000 tonnes - a decidedly sharp drop from 1973, the shortfall in demand could rise to 283,000 tonnes in 1981 and 305,000 tonnes in 1985. Canada's role fulfilling some of this increased demand depends on the squid fishing harvests of our competitors - Australia, New Zealand and Argentina - who also hope to fill the gap.

Since domestic 1978-79 production is expected to fall to about 300,000 tonnes from 325,000 tonnes in 1977-78, imports from North America and Argentina are expected to increase to some 40,000 tonnes in 1978-79 from 25,000 tonnes the previous season. On the assumption of total supply of 356,000 tonnes (see Table III-11), a shortfall of 50,000-100,000 tonnes is probable. On this expectation, the potential for greater exports from Canada appears good.

TABLE III-10
UTILIZATION OF SQUID
('000 tonnes round weight)

Fresh	175	34.7	245	39.0	90	17.4	192	37.3	589	36.1
Surume	32	6.3	52	8.3	43	8.4	35	6.7	49	8.3
Smoked	1	0.2	1	0.1	3	0.5	2	0.4	2	0.4
Salted	-	-	-	-	1	0.2	1	0.1	1	0.2
Fermented	8	1.6	13	2.0	12	2.4	13	2.5	15	2.4
Prepared	243	48.2	268	42.7	318	61.7	236	45.8	268	45.4
Canned	1		8	1.2	5	1.0	3	0.5	8	1.4
Bait	43	8.4	39	6.3	42	8.1	32	6.3	32	5.5
LANDINGS	482		599		486		470		531	
IMPORTS	22		28		29		45		58	
TOTAL	504	100.0	627	100.0	515	100.0	515	100.0	589	100.0

CHART 3
Japanese Squid Landings



Source: Table II-8

However, the Japanese are also stepping up their efforts to develop a squid fishery in foreign waters to generate new sources of supply and offset declining domestic volumes. A few years ago, Japan launched a fishery in New Zealand waters and in 1978 participated in a joint operation with Canada off the Atlantic coast. Japan is also engaged in development of a fishery off Argentina. Japanese efforts to expand squid fishery in foreign waters include the following:

(i) Argentina

In 1976, the year of squid shipments, Japan imported 570 tonnes. The following year, due to poor fishing harvests, only 27 tonnes were imported. Earlier this year landings of 40,000 tonnes had been reported, including 5,000 tonnes caught by Japanese trawlers. Of 35,000 tonnes landed by non-Japanese vessels, an estimated 10,000 tonnes will be exported to Japan, 5,000-6,000 tonnes to South Korea and the balance to Portugal and other European countries.

Reported prices are about US\$ 730-970 tonnes FOB Argentina with freight costs to Japan costing an additional US\$ 205. Last year, prices in Japan began dropping from about yen 330/kg in August to yen 250-300 by October because squid are too large (440-500 grams each), contain roe and have poor yield (mantle yield 38-48%).

(ii) New Zealand

Japan landed 47,000 tonnes of squid in New Zealand waters between November 1976 and March 1977 and 44,000 tonnes in 1977-78. Landings for the 1978-79 season are expected to fall to about 33,000 tonnes because of New Zealand restrictions. At the same time, New

Zealand interest in squid fishing is on the rise and fishermen are importing more squid jigging equipment from Japan. For the future, it is likely that squid imports from New Zealand will increase significantly.

(iii) Australia

With the creation of an Australian/Japanese joint venture company and a recent agreement to establish another similar operation, squid from Australian waters is suddenly a contender for a share of the Japanese squid market. However, with insufficient information at present, it is difficult to assess the potential of the Australian fishery.

(iv) Iceland

Japan annually imports approximately 3,000 tonnes of squid from Iceland but significantly higher volumes are not expected in future.

While precise data on the end-use of squid are not available, it appears that about 80% of the common squid caught near Japan is used primarily for fresh consumption. Of 1977 landings of 150,000 tonnes, 25,000 tonnes, or 16%, were processed into surume squid; 3,000 tonnes, or 2%, into daruma and 5,000 tonnes, or 3%, into other processed forms.

Surume is essentially squid split and dried with tentacles left on. Depending on quality, surume is either distributed as is or used as a raw material for further processing. Daruma

(frequently referred to as soft daruma) is skinned, seasoned and dried squid tubes. It is a partially processed product which is finally manufactured into such items as shredded squid (saki-ika) and smoked squid rings.

Murasaki squid (*Omastrephes bartrami*), only recently used in significant quantities for food products, is primarily a raw material for daruma. In 1977, 57% of the catch of 140,000 tonnes went for daruma production with an additional 20,000 tonnes processed in other forms. Japanese caught New Zealand squid also goes mainly for fresh consumption; about 60% of the catch of 25,000 tonnes is consumed fresh with the balance used in various processed forms. Similar uses are made of Atlantic squid imported from Canada and the U.S. Of the estimated 36,000 tonnes imported during late 1977 and early 1978, about 50% was IQF frozen and distributed through supermarkets for fresh consumption, and the balance was used in processing.

From the wide range of squid products sold in Japan, the most likely export candidates for production in Canada are surume and daruma. A flow chart from one company, Natori Shokai, indicates the processing steps and the range of finished products manufactured from daruma and surume, (see Appendix 1 for further details).

(9) Shrimps and Prawns

Shrimps and prawns represent the largest group of fisheries products imported into Japan. In 1978, Japan imported some US\$ 1,067 million worth of shrimps and prawns which accounted for 31% by value

of all fisheries products imports for the year. Imports will certainly continue to be of central importance to the Japanese as domestic landings of 52,000 tonnes are equal to less than half the volume of imports in 1978 (144,000 tonnes). The domestic catch may decline fractionally to 50,000 tonnes while the total requirement grows in line with the population. Total demand is expected to reach 206,000 tonnes by 1981 and 212,000 tonnes by 1985.

(10) Other Shellfish

The shellfish situation is difficult to assess owing to uncertainties over harvesting technology and transportation. With the exception of oysters and scallops, which are both cultured extensively in Japan, export opportunities exist for a large variety of species. Sea urchins, for example, are a well established trade item. In 1978, imports of 2,315 tonnes will be filled by South Korea (1,058 tonnes) and the U.S. (486 tonnes)

For new products, including horseclams, geoducks and lobsters, supply rather than demand appears to be the limiting factor for Canada. But as the Japanese are fond of fresh shellfish, Canadian exporters should concentrate on selling live products to Japan.

IV. PROBLEMS

The Japanese market is one of the most exciting export prospects for the Canadian fish industry. Not only is there a well established consumer interest in and demand for a variety of fish

products, the Japanese have shown already that they are willing to pay more for the species they enjoy. As well, in the face of dwindling supplies at home and reduced access abroad, the Japanese are increasingly dependent on fish exporting sources such as Canada.

But the potential of a dynamic consumer market will not be met without a keen marketing effort of Canadian exporters. To that end, exporters must ensure that they meet the high standards of the local Japanese market. Without sensitivity to the requirements for grading and cutting, exporters will find it difficult to build customer loyalty. A reputation as a reliable, standard-conscious exporter will go far in Japan. Quite aside from meeting minimum standards in packing and processing, exporters should strive to make their products as visually appealing as possible. As noted earlier, some products in high demand, such as squid and shellfish, are sold live. This is not a significant factor in understanding the Japanese market, where buyers are keen to buy fresh, high-quality products. Transportation and freight costs should be carefully analyzed so that exporters can make and fulfill their commitments to Japanese importers.

At home, a further investigation should be made of the Canadian rule which sets a minimum of 54% moisture content for raw No. 1 salted sockeye and pink salmon. At present, the regulation is an impediment to expansion of sales of these products to Japan which prefers less salt.

SURUME

Processing details vary slightly among producers but one company (sumiyoshi Suisan) provided the following outline. The preferred method is sun drying although the procedure outlined below is used in conjunction with mechanical driers.

1. Split and cleaned squid are hung on racks.
2. The two long tentacles are separated and draped around the drying rack to help spread the tentacles and promote even drying, particularly where the tentacles join.
3. Dry initially at 40⁰C for 3 hours and then at 38⁰C for 6-8 hours.
4. The partially dried squid are shaped and the tentacles are separated by hand and dried another 8 hours at 35⁰C.
5. Final shaping, grading and packing.

Appearance (shape), colour and size are the major factors which determine the quality of finished product. The drying temperatures and times vary according to species and quality of the raw material. While the general process is not sophisticated, experienced workers are needed to properly vary the procedure. Yield (final product weight to round weight) varies from 22% for Japanese common squid to 19% for New Zealand squid.

Relative size of 200, 300 and 800 gram bundles are shown in Illustration 8. Producer prices received earlier this year were Yen 33,000 and Yen 25,000 per 10 kg for surume produced from

common squid and New Zealand squid respectively. By comparison, Argentina squid used in surume is much larger than that made from common squid.

DARUMA

Daruma is a semi-processed product used as a raw material for snack/appetizer type products (chinmi). The squid chinmi producers are organized into Squid Processors' Association and their combined value of output is an estimated \$200 million annually. In the Hakodate area, one of the major squid processing areas in Japan, the annual raw material requirement is estimated at 70,000 tonnes. The chinmi market is so large that specialization has taken place so that some firms only produce daruma and sell their product at about yen 1800/kg to final producers. In the past, chinmi producers were vertically integrated producers making the final product from raw squid.

Surume and daruma production in Canada is technically possible with Japanese assistance. On an optimistic note, there already appears to be some interest among chinmi processors to import semi-processed products from Canada. Given these considerations, an investigation should begin into the economic feasibility of Canadian production.

CHART 5
USES OF DARUMA AND SURUME

