In 1933 the 1,823 vessels were distributed as follows: 37/

Offshore waters	
East of 130°E and north of 25° N	870
West of 130° E and north of 25° N	765
Kwantung waters	116
Korean and Soviet waters	60
South China Sea	12
Total	1,823

Like the larger other trawlers these vessels were limited in number and in the extent of their operations. Each boat was licensed by the Ministry of Agriculture and Forestry. To protect the coastal fisheries of the small villages, drag-netting was not permitted along most coastal areas. 38/

The dragging vessels in offshore waters operated from ports of the west coast prefectures, chiefly Nagasaki and Yamaguchi, with smaller numbers from Fukuoka and Saga prefectures. In 1933, 901 of the vessels operating in offshore waters were from Nagasaki Prefecture and 559 from Yamaguchi. The 116 Japanese vessels operating in Kwantung waters secured permits from the government of Kwantung Leased Territory and made Dairen and Port Arthur their home ports. The vessels working in waters along the Korean and Soviet coasts were based on the ports of northern Japan; in 1933, 23 were from Hyogo Prefecture and 21 from Hokkaido.

37/ Seiji Konda, Geography of the Marine Industry of Japan, 1936. Presumably the production from the drag-net boats in the offshore waters is included in either the coastal fisheries or the deep-sea fisheries in home waters (probably the latter). The South China Sea production may be included in production figures for deep-sea operations in "home waters" or with trawling. The production from the operations in the other areas presumably is included in production of Korean waters and Northern waters.

38/ Some sources say it was prohibited in all coastal areas. but may be referring to trawling rather than drag netting.

The Northern Fisheries.

General. Included in the "Northern Fisheries," as usually considered are three major categories: the fisheries in Soviet waters, the floating factory fisheries and the fishing off the Northern Kuriles. 39/ Together these accounted for an annual production valued from ¥ 72 million to ¥ 132 million in the period 1936 - 1940 (Table 24). Figures giving the volume of the entire catch of these fisheries are not available because part of the catch is immediately canned or processed. It may be roughly estimated at between 200,000 and 300,000 metric tons annually in the prewar period. 40/

TABLE 24

Value of Japanese Northern Fisheries, 1936 - 1940

(1,000 yen)

	1936	1937	1938	1939	1940
Fisheries in Soviet Waters	35,489	37,598	44,007	49,164	44,524
Factory Ship Production	19,181	25,809	28,136	31,573	21,623
Fishing off Northern Kuriles	17,807	25,483	30,663	42,920	25,315
Total	72,477	88,890	102,806	133,657	91,462

Source: Toyo Keizai Nenkan, 1943.

39/ The fisheries of Karafuto and the southern Kuriles might well be included in the "northern fisheries," but statistics on the production of these areas generally are not included. Small coastal fishing craft operate off the southern Kuriles and also predominate off Karafuto whereas the northern fisheries described here are of a larger scale commercialized nature based on Japan proper.

40/ The statistics available make it difficult to estimate the production of the Northern fisheries in terms of weight as caught. Some estimates place the 1938 production as high as 350,000 metric tons.

Most of this northern catch was normally exported; one estimate places the export at 65 to 70 percent of the production, the remaining 30 to 35 percent being for domestic consumption. Approximately one-fourth to one-third of Japan's prewar fishery exports are reported to originate in these fisheries.

The northern fisheries provided employment, full or part-time, for about 40,000 - 50,000 persons. Most of these were seasonal workers recruited from the small farming-fishing villages of northern Honshu and Hokkaido. From April or May until September they fished or processed fish in the northern areas and then returned to eke out a meager living from the desolate land and the coastal waters of their home districts.

Hakodate and Otaru in Hokkaido were the bases of operations for the northern fisheries, the ports from which the fishing and supply vessels sailed and at which there were facilities for shipbuilding and ship repairing, can manufacturing and storage. Hakodate was also the main export point for the canned products.

The northern fisheries are controlled by "big business." At one time more than a hundred small firms were operating in these areas but after successive mergers over a period of years most of the operations by 1939 had come under two large companies: the Nichiro Gyogo K. K. which had virtually a monopoly over the fishing in Soviet waters and also operated in the northern Kuriles; and the Nippon Suisan which operated the crab canneries and also the trawl fisheries off the Kuriles

16-031 P116 bu

and Kamchatka. 41/

The areas fished, the location of fishery lots and of the canneries for the year 1940 are shown in Figure 8. Production of canned fish is discussed in more detail under Processing (pages 127-136), but is also mentioned here because it is impossible to separate production and processing for these northern fisheries. Each of the three subdivisions of the northern fisheries is discussed briefly in turn.

Fisheries in Soviet Waters. The fishing in Soviet waters was done along the Soviet coast by virtue of the Russo-Japanese Fishing Treaty which not only permitted fishing in these waters but also provided for the leasing of fishing lots by the Japanese. This enterprise which has frequently given rise to disputes between the Soviet Union and Japan (pages 185-188) was the oldest of the northern fisheries and in recent pre-war years still provided the largest output. Japanese operations engaged about 20,000 men and 150 vessels in recent years and production was valued at ¥ 35 - 49 million, of which canned fish constituted about 60 percent (Table 25). 42/

In this fishery Japanese and Russians both have rented "lots" 43/ and carry on fishing for salmon and crab. From the shore bases shore trap nets are operated to catch salmon and nets for crab. In 1940 the lots

41/ See pages 178-181 for more details of these companies.
42/ During the war, particularly since 1942, the production of this fishery has been greatly reduced but a report of May 1945 indicated expected operations on "25 grounds in four areas."
43/ The "lots" consisted of specified ground on shore, 340 meters wide and 90 meters deep where processing plants, barracks and other accomodations for the workers were built. By the stipulations of the treaty, no lots could be closer together than 2,120 meters.

CONFIDENTIAL

REVISED EDITION

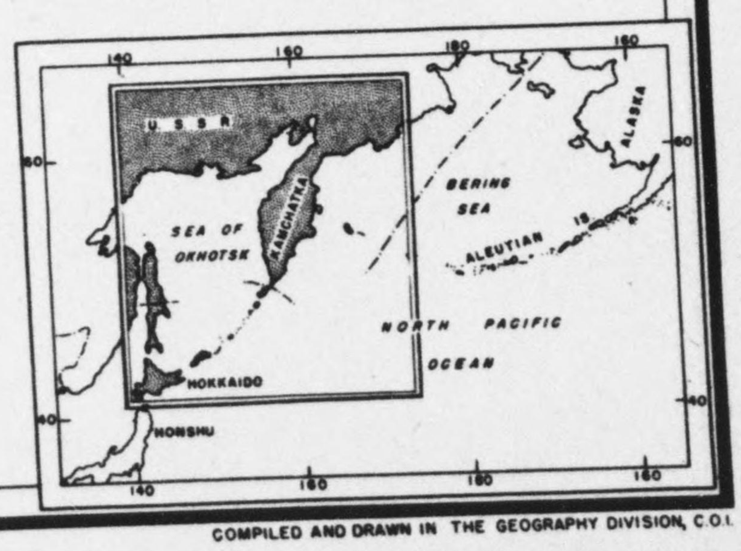
JAPANESE AND RUSSIAN FISHERIES IN THE NORTHWEST PACIFIC

- LOCALITIES WITH AT LEAST ONE JAPANESE CANNERY REPORTED
- LOCALITIES WITH AT LEAST ONE RUSSIAN CANNERY REPORTED
- JAPANESE FLOATING CANNERIES (SALMON) 1936
- JAPANESE FLOATING CANNERIES (CRAB) 1936
- RUSSIAN SALMON FISHERIES
- JAPANESE LEASED SALMON FISHERIES
- RUSSIAN CRAB FISHERIES
- JAPANESE LEASED CRAB FISHERIES
- FISHING AREAS FREQUENTED BY JAPANESE ONLY

Place names in ITALICS refer to fishing districts. Numbers which follow indicate the number of fishing lots worked by Russians (first number) and Japanese (second number) in 1940. Underscored numbers refer to crab fishing lots, others to salmon.

GIZHIGINSKI (10,27)
OLIUTORSKII (59,36:4,0)
KICHIGINSKII (44,30)
Penzhinskaya Gulf
KARAGINSKI (10,71)
BERING SEA
OKHOTSK (29,24)
TAUSK (10,0)
ITINSKI (33,54:6,12)
KOMANDORSKI IS.
S E A O F O K H O T S K
EAST KAMCHATKA (23,15:2,0)
NIKOLAEVSK (2,0)
KIKNCHINSKI (26,33:5,5)
PETROPAVLOVSK
BOLSHERETSKII (25,33:5,0)
Argido To
Shimushu To
Paramushiru I.
SAKHALIN (18,4)
PRIMORSKII (68,5:?,0)
ALEXANDROVSKI
SOVIETSKAYA GAVAN'
Gulf of Tartary
KARAFUTO
CHISHIMA (KURILE)
HOKKAIDO
HAKODATE

0 100 200 300 MILES



MAP NO. 504, MAY 14, 1942

COMPILED AND DRAWN IN THE GEOGRAPHY DIVISION, C.O.I.

TABLE 25

Japanese Fisheries in Soviet Waters, 1936 - 1940

	1936	1937	1938	1939	1940
Number of Fisheries:					
Leased for the year	399	389	386	356	349
Worked for the year	376	355	328	296	307
Fishing Vessels:					
Steamships - Number	152	141	131	118	169
- Tonnage	360,653	331,734	309,884	307,496	433,198
Sailing ships - Number	1	1	1	-	-
- Tonnage	525	525	525	-	-
Fishermen	20,364	19,858	19,031	n.a.	n.a.
Production					
Total, Koku	571,351	549,858	479,745	510,080	340,234
Dog Salmon, Koku	337,561	176,750	169,859	122,382	139,841
Salmon Trout, Koku	164,627	298,869	221,873	323,287	152,603
Red Salmon, Koku	67,204	71,106	86,661	63,012	45,964
King Salmon, Koku	1,925	3,086	1,257	1,433	1,681
Herring Guano, Koku	34	47	95	27	145
Crab, pieces (thousands)	6,565	7,759	8,428	8,968	6,509
Fishery Products, Prepared					
Total - Value (1000 yen)	35,489	37,598	44,007	49,164	44,524
Salt cured:					
Total					
Quantity, Koku	376,434	555,432	258,011	257,104	173,784
Value (1000 yen)	13,099	11,698	11,667	16,192	12,833
Salmon					
Quantity, Koku	307,578	374,486	151,552	107,201	118,431
Value (1000 yen)	11,538	7,825	8,536	9,255	10,084
Salmon Trout					
Quantity, Koku	68,856	180,946	106,459	149,903	55,353
Value (1000 yen)	1,560	3,873	3,131	6,938	2,749
Canned:					
Total					
Quantity, Cases	1,147,243	1,155,407	1,287,946	1,193,630	1,030,998
Value (1000 yen)	20,198	23,235	29,011	27,911	26,758
Red Salmon					
Quantity, Cases	343,000	342,325	444,624	n.a.	n.a.
Value (1000 yen)	8,826	11,841	15,985	12,061	10,472

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TABLE 25 (Continued)

Japanese Fisheries in Soviet Waters, 1936 - 1940

	1936	1937	1938	1939	1940
Salmon					
Quantity, Cases	117,000	1,318	35,015	n.a.	n.a.
Value (1000 yen)	2,425	26	695	599	1,018
Salmon Trout					
Quantity, Cases	637,000	733,055	728,328	n.a.	n.a.
Value (1000 yen)	6,338	7,084	7,886	11,356	12,499
Crab					
Quantity, Cases	50,000	78,709	79,979	n.a.	n.a.
Value (1000 yen)	2,610	4,284	4,445	3,895	2,768
Others					
Value (1000 yen)	2,192	2,666	3,329	5,061	4,933

1 Koku = 40 kan.

n.a. - not available

Source: Orient Yearbook, 1940; Toyo Keizai Nenkan, 1943.

16-031 P120 bu

leased to the Japanese numbered 349, less than 50 percent of the total number although in earlier years Japan had a much larger share; in 1924, for example, it rented 88 percent of the total number. According to Japanese statistics in the period 1934 - 1939 Japan averaged 76 percent of the rent and 57 percent of the salmon catch from slightly less than half of the lots and 40 percent of the rent and 45 percent of the crab catch from about one-third of the lots (Table 26). The areas of Japanese operations, both fishing and processing, are chiefly along the coasts of Kamchatka but some are along the Okhotsk and Primorsk coasts of Siberia (Table 27 and Figure 8). 44/

Floating Factory Fisheries. Floating factory operations, concentrated on salmon and crab, were carried on chiefly in the Okhotsk and Bering Seas north of 51° N. and beyond the three mile limit of territorial waters. 45/ Most of the fishing was near the coasts of Kamchatka (both east and west), but some of the vessels worked out into Bering Sea. 46/ In recent prewar years 6 - 11 large salmon factory vessels and 4 - 9 crab factory vessels, each attended by auxiliary ships, were operating in this fishery and more than 6,000

44/ Japanese operations in the waters of the Primorsk region of Siberia and in the waters of Sakhalin are very limited. These areas are fished almost exclusively by the Russians. The Japanese, however, had nine lots in the Primorsk region in 1939 (Table 27).

45/ The mothership system of salmon fishing was limited by official regulations to areas north of 51° N., thus excluding these floating canneries from the coastal waters of Hokkaido, Karafuto and the Kuriles.

46/ Since 1930 several crab canneries have operated in Bristol Bay, Alaska and in 1937 and 1938 the catching of salmon in these waters aroused American fishermen (see page 188).

TABLE 26

Soviet Water Fishery

Japanese Operations

	Salmon and Trout			Crab			Total	
	Number of Grounds	Rental (1,000 rubles)	Quota (1,000 centner)	Number of Grounds	Rental (1,000 rubles)	Quota (1,000 cases)	Number of Grounds	Rental (1,000 rubles)
1934	369	6,627	1,367	17	440	105	386	7,067
1935	378	6,804	1,380	17	440	105	395	7,244
1936	382	6,840	1,386	17	440	105	399	7,280
1937	372	6,742	1,351	17	439	105	389	7,181
1938	369	6,771	1,346	17	440	105	386	7,210
1939	339	6,592	1,197	17	464	105	356	7,056
				Soviet Operations				
1934	333	1,576	957	32	723	130	365	2,479
1935	343	2,189	983	32	711	130	375	2,900
1936	387	2,285	1,019	32	711	130	419	2,997
1937	388	2,378	1,017	31	694	127	419	3,072
1938	375	2,342	988	27	647	117	402	2,990
1939	361	2,160	950	23	584	106	384	2,744

Note: The term "quota" is the maximum amount of catch permitted under the Soviet-Japanese agreement. The quota has been reached invariably each year.

Source: Far East Yearbook, 1940.

TABLE 27

Japanese Fishery Establishments in Siberia, 1939

Location	Number of Lots	Yield	Canneries[a]	Refrigerators[a]	Freezing Plants[a]
Eastern Kamchatka:					
N.E. Kamchatka	138	Salmon	8	24	4
S.E. Kamchatka	15	Salmon, crab			
Western Kamchatka:					
N.W. Kamchatka	73	Salmon	25	24	0
S.W. Kamchatka		Salmon and salmon trout, crab			
Okhotsk Coast	42	Salmon trout, herring	1	7	0
Primorsk	9	Salmon and salmon trout	0	0	0
Total	348		34	55	4

a/ These are plants of the Nichiro Gyogyo K. K. which virtually controls all the operations in Soviet waters. In 1938 the company operated 10 small storage plants on vessels in addition to 48 ice storage plants. Presumably this type of plant on vessels was also operated in 1939.

Source: O.S.S. report "The Fishing Industry of Japan," June 1942.

fishermen and workers were employed on these floating canneries (Table 28).

Floating salmon canneries made their first appearance in 1927, in direct competition with the fishery of the leased lots; fishing concerns which had lost their lots to the Nichiro Gyogyo K. K. turned to floating canneries. After 1935, however, when there was an amalgamation of the canneries under a subsidiary of the Nichiro Gyogyo K. K., the factory vessels were developed in competition with Soviet operators of leased lots. Most of the canned salmon produced on floating factory ships were red salmon, the most valuable canned product and also the mainstay of the fishing lots. 47/

Floating crab canneries, controlled by Nippon Suisan, accounted for about half of the Japanese production of canned crab in 1936 and other prewar years. 48/ The system of operation was much like that for salmon. The season began in April and lasted until October. Actual fishing was done from small "kawasaki" boats, which spread their gill nets 49/ in lengths of 2½ to 4 miles along the sea bottom surrounding the cannery. The crabs caught, giant or "taraba-kani" crabs, were taken to the factory ships for canning.

47/ Operations of floating salmon canneries as conducted were in many respects tantamount to an economic blockade against coastal fisheries. Shore canneries complained of decreases in the size of fish caught and reported that many were marked by the nets of the floating canneries.

48/ Competing with the Japanese ships for crab after 1928 were floating crab canneries of the Soviet Union.

49/ Each crab catcher boat carried about 500, 168 foot gill nets of 18" mesh (stretched) which were used in the lengths of several miles.

16-031 P124 bu

TABLE 28

Japanese Factory Ship Fishing, 1935 - 1940

	Salmon and Salmon Trout									
	Fishing Vessels			Number of Men	Catch Number in 1,000's	Value of Manufactures (thousand yen)				
	Number	Tonnage	Number of Tender Ships			Total	Canned[a]	Salted	Frozen	Fish Eggs
1935	8	29,456	250	4,972	11,544	10,129	7,785	1,651	590	104
1936	6	20,467	170	3,478	8,796	9,691	7,409	1,760	455	67
1937	7	22,002	170	3,310	10,115	14,615	12,051	1,750	691	123
1938	7	21,826	170	3,529	9,830	14,250	10,449	3,632	-	169
1939	1	34,451	n.a.	n.a.	11,651	21,132	15,146	5,290	375	320
1940	10	33,661	n.a.	n.a.	10,400	15,558	9,563	5,554	-	441

	Crab					
	Fishing Vessels[b]		Number of Men	Catch Number in 1,000's	Canned Production	
	Number	Tonnage			Number of cases[c]	Value (1,000 yen)
1935	9	34,112	3,124	11,332	171,000	8,429
1936	9	36,737	3,243	13,948	184,836	9,490
1937	9	36,749	3,420	14,913	204,375	11,194
1938	8	28,750	2,824	18,536	253,596	13,886
1939	7	24,805	n.a.	14,230	204,000	10,441
1940	4	13,588	n.a.	8,558	122,400	6,065

a/ Number of cases given in Table 25.
b/ Tender ships for crab canneries numbered 104 in 1936.
c/ 1 case of crab equals 22.32 kilograms.

Source: Japan Yearbook 1940-41; Orient Yearbook, 1942; Toyo Keizai Nenkan, 1943.

Northern Kuriles Fisheries. 50/ Fishing is the most important industry of the northern Kuriles; in fact, it is practically the only industry. In the decade immediately preceding the war the northern Kurile fisheries were developed commercially and in 1938 the value of this production was almost three-fourths that of the Soviet waters and exceeded that of the factory ships (Table 24). Fishing of the northern Kuriles was conducted largely in the vicinity of the three northernmost islands — Shumushu, Paramushiro and Araito. In 1938, 600 vessels were reported to be employed in this fishery; most of the vessels were based on Hakodate, coming north for the summer season. The boats were largely trawlers and small motorized salmon drift-netters but there were also a considerable number of unmotorized hand-line cod-fishing craft and a few small crab-netters and boats for line trawling of cod. These boats had shore bases within the area for the period of summer operation; these places also served as processing centers. In 1935 there were 34 fishing bases in the northern Kuriles, the most important being located at Suribachi Bay, Murakami Bay, Kashiwabara Bay and Kataoka Bay. 51/

Salmon, crab and cod were the basis of the northern Kurile fishery, salmon being the mainstay (Table 29). Salmon were caught by trawling and by nets placed in rivers and along the shores; trawling was particularly effective as it was possible to intercept schools of fish heading

50/ The southern Kuriles are regarded for most statistical purposes as a section of the Nemuro Branch Bureau of Hokkaido and are not included in "the northern fisheries." For further details of the Kurile fisheries see Military Government Handbook, Kurile Islands, OPNAV 50 E-2, November 1943.

51/ Since then a fishing base is reported to have been developed in the Kakumabetsu region.

16-031 P126 bu

TABLE 29

Fisheries of Northern Kuriles, 1936 - 1940

	Catch					Value of Manufactures				
	Salmon and Salmon trout No. (1000)	Crab Number	Cod Number	Other Number	Seaweed (kan)	Total 1000 ¥	Salmon Canning 1000 ¥	Crab Canning 1000 ¥	Salmon Salting 1000 ¥	Other 1000 ¥
1936	51,899	2,312,183	4,139,696	323,000	20,320	17,807	9,964	1,102	5,232	1,509
1937	84,365	3,023,006	3,429,846	579,262	33.650	25,483	12,199	2,207	9,111	1,966
1938	82,689	3,606,485	3,263,059	997,619	22,288	30,663	12,268	2,526	13,356	2,513
1939	130,960	4,227,393	3,628,209	7,184,746	740[a]	42,920	11,013	2,805	23,412	5,689
1940	31,772	2,959,210	4,245,833	6,027,689	28,844	25,315	8,777	1,998	10,287	4,252

a/ As given in source.

Source: Toyo Keizai Nenkan, 1943.

toward the spawning rivers which flow into the Okhotsk Sea. About 60 percent of the salmon from this fishery is reported to have been canned in prewar years; the value figures (Table 29) suggest, however, that from 1938 on more was salted than canned. The principal crab area was along the western shore of Paramushiro. In 1938 16 vessels and 4 crab canneries were reported. Cod was caught in fairly deep water off the western coast of Paramushiro and Shimushu from April until September. In 1938 2,200 persons were engaged in catching and drying cod in the northern Kuriles.

Fishing in Outlying Colonial Waters. Fishing in the waters of Korea, Formosa, Kwantung Leased Territory and the South Sea Mandated Islands, independent of operations in these waters by locally based fishermen, accounted for 57,500 metric tons in 1936 and 36,000 tons in 1938 (Table 30). Some of these operations were by trawlers and drag-netters, others were by purse seining and those of the South Seas and Formosa included bonito and tuna fishing.

Special Fisheries.

Seaweed Production. Sea plants attain a remarkable importance in the fisheries of Japan. Numerous species were taken for widely different uses: some were dried and used as food, others processed to yield iodine, potassium or other chemicals, agar-agar, sizing materials and fertilizers. The total production of seaweed ranged from 389 million to 589 million tons in the period 1935 to 1940, and in 1940 when the production was 589 million tons it was valued at ¥ 39 million (Table 31).

16-031 P128 bu

TABLE 30

Japanese Fishing in Outlying Colonial Waters, 1935 - 1939

	1935	1936	1937	1938	1939
Korea					
Number of boats	1,063	n.a.	n.a.	n.a.	n.a.
Volume of catch, 1000 kan	29,393	2,705	9,711	6,277	4,718
Value of catch, 1000 yen	4,021	3,063	3,196	3,444	3,159
Formosa					
Number of boats	15	15	124	26	n.a.
Volume of catch, 1000 kan	24	42	137	103	406
Value of catch, 1000 yen	26	23	126	92	n.a.
Kwantung					
Number of boats	212	200	167	146	n.a.
Volume of catch, 1000 kan	1,564	2,065	1,203	1,273	1,165
Value of catch, 1000 yen	922	978	531	636	n.a.
South Sea Mandated Islands					
Number of boats	n.a.	84	128	191	n.a.
Volume of catch, 1000 kan	n.a.	524	1,027	966	689
Value of catch, 1000 yen	n.a.	1,831	3,350	2,340	n.a.
Total					
Number of boats	1,290	n.a.	n.a.	n.a.	n.a.
Volume of catch, 1000 kan	30,981	15,336	12,078	9,619	7,008
Value of catch, 1000 yen	4,969	5,895	7,203	6,512	n.a.

n.a.-- Not available

Source: Compiled from official Japanese statistics from several sources.

TABLE 31

Seaweed Production, 1935-40 a/

	Quantity		Value
	1000 kan	1000 tons	1000 ¥
1935	132,141	496	10,173
1936	128,685	483	12,308
1937	153,725	576	14,927
1938	109,824	403	14,332
1939	103,660	389	27,304
1940	157,085	589	38,884

Source: Toyo Keizai Nenkan, 1943.

a/ It is not clear from the source whether this includes production of Porphyra raised by culture and the production of seaweed in the Northern Kuriles or only the amount taken in the coastal fisheries of Japan proper. About 8 - 9 million kan was produced annually by culture and 20 - 30 thousand kan produced in the Northern Kuriles.

The three most important kinds of marine algae produced were: (1) brown algae (Laminaria species) commonly known as "tangle"; (2) laver or nori (Porphyra species); and (3) tenguse (Gelidium species) used for the manufacture of agar-agar.

Laminaria. Several species of the Laminaria genus which grow most abundantly in the waters of the north, especially in those of Hokkaido and Karafuto, were collected and processed in several ways. Nemuro in Hokkaido was the center of this industry. The chief use was as a food; under the general name of "kombu" it was of universal use for flavoring purposes in Japanese cookery. Some of the "tangle" was used for the production of iodine and potassium. Although most of it was consumed domestically some is normally exported, chiefly to China.

Laver or nori (also called ama-nori and asakusa-nori), of which Porphyra tenera is the leading species, was not only collected but also cultivated in numerous places. It was produced chiefly along the east coast of Honshu and along the shores of the Inland Sea. Japanese statistics for 1936 claimed a culture area of 50 million square meters. Yields in recent years have been 30.8 to 35.0 million kilograms (Table 15). The largest production was in the waters of Tokyo Bay; Tokyo Prefecture and the neighboring prefectures of Kanagawa and Chiba are estimated to have produced about 70 percent of the total. Aichi, Mie and Hiroshima prefectures ranked next with Yamaguchi, Kumamoto, Fukuoka and Shizuoka prefectures producing smaller amounts.

Shallow bays and inlets where the water is somewhat brackish and where the plants are partially out of water at low tide were preferred for cultivation. Bundles of bamboo brush on which spores were collected were placed in the sea in September and later the bunches were transferred to nearby rearing sites. The gathering of "leaves" began in December and continued through the following March, in many cases the collection being carried on by farmers as a winter season side-line. The weeds were washed, cut into shreds and then dried in sheets on reed screens. Sun drying was commonly employed although drying rooms with artificial heat were used in some places. Dried laver, used as a food, was simply roasted or was further processed to give it special flavor.

16-031 P131 bu

Gelidium. Various species of Gelidium, found along the entire Japanese coast, were used in the manufacture of agar-agar (see page 145). The largest quantities are produced in the shallow waters of the east coast of the warm current region (Nagano, Osaka, Hyogo, Kyoto, Gifu, Yamanshi, Shizuoka, Wakagama and Tokyo prefectures), but agar-agar was also made in Karafuto from a different raw material.

Others. Of the numerous other seaweeds produced in lesser quantities than the three described above, one was perhaps more important — funori (Gloiopeltis species) which was used as sizing for textiles. The plant grows naturally along much of the Japanese coast, but was also cultivated in some localities by placing rocks in the sea to which the algae attached itself. The Matsuurbi district of Nagasaki Prefecture and Aomori, Ibaraki and Wakayama prefectures are reported to have produced considerable quantities.

Whaling. Whales were of importance to Japan chiefly in providing oil (for domestic consumption and export), but also furnished bone-meal fertilizer and human food. In 1939 the value of Japanese whaling was ¥ 26,777,000 (Table 32), a sizeable item in the marine products industry.

In the years preceding the war Japan's whaling activities increased greatly; in 1930-31 Japan caught 2.7 percent of the whales taken in the world's commercial whaling operations and produced

16-031 P132 bu

TABLE 32

Japanese Whaling Operations

Year [a]	Japan Proper		Colonial Waters	
	No. of whales caught	Value (¥ 1000)	No. of whales caught	Value (¥ 1000)
1934	1,156	1,142	202	434
1935	1,356	1,991	123	430
1936	1,598	2,467	173	647
1937	1,641	2,578	173	754
1938	1,814	3,397	236	895
1939	1,790	3,873	189	1,118
1940	2,153	5,068	145	1,047

Antarctic Ocean

Year [a]	Mother Ships	Tender Ships	Crews	No. of whales caught	Value of Manufacture (¥ 1000)
1934	-	-	-	-	-
1935	1	3	213	213	487 [b]
1936	1	5	343	639	2,263 [b]
1937	2	13	766	1,965	8,727 [b]
1938	4	31	1,796	5,565	14,456 [b]
1939	6	49	2,794	7,540	21,786
1940	n.a.	n.a.	n.a.	n.a.	n.a.

Source: Official Japanese statistics from several sources. 1940 figures from Toyo Keizai Kenkan, 1943.

n.a. - not available.

a/ Year ending March 31st.
b/ Estimate.

18-031 P133 bu

0.5 percent of the world's whale oil; in 1937-38 Japan caught 13.8 percent of the total world's production and produced 11.6 percent of the oil (Table 33).

Japanese whaling is carried on in two areas: Antarctic waters and the Japanese home and nearby colonial waters. The Antarctic operations are the more productive, accounting in 1937-38 for more than 5,500 whales and more than 64,000 metric tons of oil as compared with less than 2,000 whales and 5,500 tons of oil from the operations in home and colonial waters. (Table 34).

Antarctic Operations. Japan's entry into Antarctic whaling dates from 1934-35 when a ship purchased in Norway with a crew including Norwegians was licensed to operate by the Japanese government. By the 1938-39 season six ships entirely manned by Japanese were operating. All of these were floating factories averaging 16,000 - 17,000 tons. Working from these mother ships were powerful catcher boats averaging about 350 tons equipped with harpoon guns. In 1938-39 the catcher boats numbered 49, an average of eight for each of the mother ships.

Three companies were engaged in the Japanese Antarctic whaling in 1938-39; the Nippon Suisan K. K. with three ships, the Taiyo Hogei K. K. with two, and the Kyokuyo Hogei K. K. with one (Table 35).

16-031 P134 bu

TABLE 33

Japanese Whaling Compared to World's Total, 1930-31 to 1937-38

	All countries all areas	Japan	Japanese Percent of total
	Number of Whales		
1930-31	42,874	1,147	2.7
1931-32	12,797	1.036	8.1
1932-33	28,668	1,122	3.9
1933-34	32,167	1,436	4.5
1934-35	39,254	2,000	5.1
1935-36	44,782	2,479	5.5
1936-37	51,256	4,025	7.9 a/
1937-38	54,664	7,552	13.8 a/
	Oil Production (barrels) b/		
1930-31	3,686,976	16,274	0.5
1931-32	915,842	20,230	2.2
1932-33	2,596,778	21,698	0.8
1933-34	2,573,155	22,766	0.9
1934-35	2,691,283	42,133	1.6
1935-36	2,871,117	74,289	2.6
1936-37	3,210,671	189,012	5.9
1937-38	3,635,010	422,036	11.6

Source: International Whaling Statistics, XIII, Oslo, 1939.

a/ A Japanese source gives slightly different figures for these — 5.7% in 1936-37 and 12.1% in 1937-38, but the same percentages of the oil production as given here.
b/ A barrel equals 1/6 ton.

16-031 P135 bu

TABLE 34

Japanese Whaling in 1937-38 and Summer of 1938 a/

	Antarctic	Coast of Japan and Korea	Total
Species of whales caught:			
Blue	2,397	4	2,401
Fin	2,709	293	3,002
Humpback	475	60	535
Sei	-	553	553
Sperm	1	785	786
Others	-	275 b/	275
Total	5,582 d/	1,970	7,552
Oil Production (barrels) c/	338,683 d/	33,353	422,036
Shore stations	-	21	21
Floating factories	4	-	4
Catcher boats	30	25	55

Source: International Whaling Statistics, XIII. Oslo, 1939.

a/ These figures differ slightly from the official Japanese figures (Table 32).
b/ Two right whales and different kinds of small whales.
c/ A barrel equals 1/6 ton.
d/ This is the last year for which full data are available. According to Japanese sources 1938-39 Antarctic production amounted to 7,540 whales and 483,774 barrels of oil.

16-031 P136 DU

TABLE 35

Ships Engaged in Japanese Antarctic Whaling, 1938-39

Floating factory ships	Tonnage	Number of Catcher Boats	Company Owning ship a/
Tonan Maru	9,966	5	Nippon Suisan K. K.
Dai Ni Tonan Maru	19,425	8	Nippon Suisan K. K.
Dai San Tonan Maru	19,209	8	Nippon Suisan K. K.
Nisshin Maru	16,764	9	Taiyo Hogei K. K.
Dai Ni Nisshin Maru	17,553	9	Taiyo Hogei K. K.
Kyokuyo Maru	17,548	9	Kyokuyo Hogei K. K.
		48 b/	

Source: Japan's Fishery Industries, 1939 (Special issue of Japan Times and Mail, 1939).

a/ A fourth mother-ship was to be added to the fleet of Nippon Suisan K. K. for the 1939-40 season; it was to have a tonnage of 19,400.
b/ Official Japanese statistics report 49 catcher boats.

Most of the Antarctic whale oil was exported. In 1938-39 of the 80,600 tons (483,800 barrels), 70,000 tons were exported leaving only 10,600 tons for use in Japan.

The Japanese operations in the Antarctic were carried on unimpeded by international regulations since Japan has refused to be a party to the international whaling conventions. Other nations operating in Antarctic waters 52/ have restricted whaling operations by agreement, imposing a season of whaling and other restrictions. 53/ Japanese whaling ships are licensed and the seasons and areas are established by the Japanese government. The seasons so established are, however, longer than those established under the international

52/ In 1937-38 these nations were: the United States, Great Britain, Norway, Germany, Union of South Africa, Argentina, Australia, Iceland and New Zealand.
53/ International whaling in the Antarctic has been restricted since the 1932-33 season. See pages 191 - 192.

16-031 P137 bu

regulations and the areas are larger. In 1937-38 the international convention limited the season south of 40° S. latitude to the period between December 8th and March 15th whereas in that year Japan started whaling on November 1st and continued until March 26th.

Coastal and Colonial Whaling. Several kinds of whales including the sperm, sei, fin and humpback were taken in waters bordering Japan (including the Kuriles) and its colonial possessions, chiefly Korea. The principal whaling grounds were off the northeastern coast of Honshu and the southern Kuriles where they are taken during the summer months, but other areas including southern Japan proper, Korea, Formosa and the Bonins are reported to have engaged in whaling.

Table 36 gives the catch by type for 1937 and 1938. Production of oil in the period preceding the war amounted to about 6,000 - 8,000 tons, most of which was used domestically.

Whaling boats in home and colonial waters are restricted to 30 and the catches are taken only by licensed persons. The vessels were modern whalers of the Norwegian type, most of them less than 120 tons.

Four companies operated in the coastal fisheries of home and colonial waters in 1938; their relative importance is shown in Table 37.

16-031 P138 bu

TABLE 36

Japanese Coastal Whaling, 1937 and 1938

	1937		1938	
	Number	Value (¥ 1000)	Number	Value (¥ 1000)
Whales Caught in Home Waters				
Sperm	1,208	1,950	1,058	1,974
Sei	445	840	551	1,069
Fin	92	332	125	556
Humpback	57	205	49	220
Blue	7	49	5	40
Right	5	21	2	13
Total	1,814	3,397	1,790	3,872
Whales Caught in Colonial Waters				
Fin	210	807	170	1,046
Humpback	16	44	18	71
Blue	5	28	-	-
Sperm	5	15	-	-
Sei	-	-	1	1
Total	236	895	189	1,118

Source: Far East Yearbook, 1940.

16-031 P139 bu

TABLE 37

Japanese Coastal Whaling Operations, 1938

Company	Number of Vessels	Number of Bases[a/]
Nippon Suisan K. K.	19	24
Hayashikane and Co. Ltd.	4	8
Ayukawa Whaling Co.	1	3
Enyo Whaling Co.	1	4
	25	39

Source: Japan Fisheries Industry, 1939 (Special issue of Japan Times and Mail, 1939).

a/ The number of bases listed is rather misleading because 11 of them were used by two companies, so that the number of separate bases is only 28. Of these 17 were in Japan proper; 5 in the Kuriles; 4 in Korea; and one each in Formosa and Kwantung. The International Whaling Statistics report only 21 bases for this year (Table 34).

Sea Otters and Fur Seals. Sea otters and fur seals are marine animals of the North Pacific valuable for their fur. Normally the Japanese took a small annual catch of each.

Sea otters occur in the Kurile Islands as well as in certain areas of Soviet and American territory. 54/ They are coastal in habit and occur in small groups, in contrast to fur seals which have a large cruising radius and at breeding periods gather in large herds. The Japanese resources, estimated at about 2,500 animals, are considerably larger than that of Russia or the United States and are protected by law (Sea Otter Protection Law of 1911). The number of animals caught and killed each year, regulated by the Ministry of Agriculture and Forestry, was limited according to a policy of conservation and propagation. The annual slaughter was reported as about one hundred animals. 55/

54/ They frequent Soviet areas of Kamchatka and the Commander Islands and American territory of the Aleutians and Alaska.
55/ Japan's Fisheries Industry 1939 (Special issue of Japan Times and Mail, 1939).

16-0 31 P140 bu

Fur seals remain during the summer breeding season in a few locations in high latitudes where it is cool and very foggy. In late fall they migrate long distances southward having a cruising radius of 1,500 - 2,000 miles. The only breeding place in Japanese territory is small Robben Island (also known as Seal Island) off the coast of Karafuto. Formerly the Kurile Islands were the habitat of many seals but these were slaughtered off many years ago. The southward migrations which begin in late fall come as far south as Chosi in the Pacific and as far as Genzan Bay (Korea) and Utsuryoto Island in the Sea of Japan. 56/ From 1911 until 1941 this "fishery" was regulated by an international agreement (see pages 193-194). A report in 1941 indicated that pelagic sealing had been revived along the Pacific coast of northern Japan (Aomori, Miyagi, Fukushima and Ibaraki prefectures).

Pearl Culture. The cultivation of pearls is one of the most spectacular and widely-publicized of Japan's aquatic industries though it is of relatively minor importance. The industry did, however, provide an annual production of pearls and pearlshell valued at more than 2 million yen and is of importance in the export trade.

Statistics from various sources differ considerably as to the number and size of farms and the quantity of production. The publication Japan's Fisheries Industry 1939 in one article gives the number of farms as 12 (including one in the South Seas) with an area of 41,000

56/ Japan's Fisheries Industry 1939 (Special issue of Japan Times and Mail, 1939).

acres producing 5 million pearl oysters, yet in another article refers to 285 places engaged in pearl culture, using 13,000 acres and employing 36,216,000 mother shells. 57/

The industry in Japan proper centers chiefly in the Inland Sea and on inlets of the ocean coasts of southern prefectures. Principal farms were situated on Omura Bay, Nagasaki Prefecture; along the coast of Saga Prefecture; in Heijo, Ago, Kata, Matoya and Mikimoto bays of Mie Prefecture; and Nagao Bay of Ishikawa Prefecture.

Pearl culture has two phases: the rearing of the pearl oyster (akoya-gai) spats; and the rearing of the shell after the insertion of the nucleus. Formerly both phases were conducted by every party but in recent years some pearl culturists purchased mother shells ready for insertion of nuclei. Spats were collected by placing stones in wire baskets along the coast during the laying season, (June and July). The stones with spats were shifted to suitable shallow water sites and after three years rearing were picked up by dredgers or diving girls. Pearl culturists purchased these mother shells, inserted the nuclei and for several years the shells were hung in the sea in fine wire baskets suspended from rafts. They were periodically inspected and tended until maturity when they were collected and opened. 58/ About 60 percent of the treated oysters produced pearls of which only a small percentage were of commercial quality. Pearl shell was a by-product of the industry.

57/ The first set of figures given here may refer to Mikimoto holdings, including the farm in the South Sea Mandated Islands.
58/ The entire process from spats to maturity usually required 6 to 7 years.

Other Products. Shells for buttons and coral are two minor marine products which have been of value in Japanese fisheries. Much of the production of both button shell and coral, however, was not in Japan proper but outlying areas.

16-031 P143 bu

III PROCESSING OF FISHERY PRODUCTS

General

Production. The greater part of the fish caught for home consumption was eaten fresh, for no village or town in Japan is so far from the sea that it cannot be supplied with fairly fresh fish. Improved refrigeration made it possible to greatly extend the range of fisheries which could supply truly fresh fish to the large urban markets. Considerable amounts, however, were processed for both domestic consumption and export.

No statistics are available which indicate the percentage of the total catch which was processed, but it is estimated that approximately one-fourth of the fish landed in Japan proper was processed for food. 59/ The volume of the manufactured fishery food products averaged about 525,000 tons in the period 1935 - 1939.

Table 38 summarizes for recent years the quantity and value of the various groups of manufactured fishery products and Table 39 the value of processed products by districts. Table 40 gives the value of the various manufactured food products as compiled by the Ministry of Agriculture and Forestry and Table 41 lists the processing methods for some of the leading marine products.

59/ This estimate is based on the knowledge that in prewar years about a third of the catch was processed into non-edible products (fish meal and oil) and an estimate that 60 - 65 percent of that remaining was consumed fresh.

18-031 P144 bu

TABLE 38

Manufactured Fishery Products of Japan a/

(Quantity in 1000 kan; Value in 1000 yen)

	Total Value	Food Products		Fertilizer		Fish Oils		Dried Seaweed b/	
		Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value
1935	175,540	119,240	137,472	99,866	28,552	16,596	8,793	190	723
1936	215,861	132,637	156,144	120,298	37,474	30,079	21,527	190	716
1937	214,871	142,956	163,024	88,985	33,115	24,437	18,002	173	730
1938	241,884	164,363	199,097	64,050	28,990	20,429	13,139	139	658
1939	391,048	140,065	309,811	79,169	55,744	19,854	24,378	174	1,115
1940	445,769	n.a.	369,472	n.a.	58,208	n.a.	16,057	n.a.	2,033

n.a. - not available

Source: Statistical Abstract of the Ministry of Agriculture and Forestry; Toyo Keizai Nenkan, 1943.

a/ Agar-agar not included.
b/ Sukifunori or dried Gloiopeltis furcata. Seaweed used for food is included under food products.

TABLE 39

Value of Manufactured Marine Products by Districts, 1937 a/

Hokkaido	¥ 63,625,600	Kyoto	¥ 2,229,284
Aomori	5,791,336	Osaka	3,543,405
Iwate	6,647,940	Hyogo	3,336,651
Miyagi	14,288,929	Nara	38,276
Akita	506,598	Wakayama	2,646.509
Yamagata	114,856	Tottori	643,481
Fukushima	3,133,734	Shimane	2,193,293
Ibaraki	9,164,063	Okayama	556,105
Tochigi	105,490	Hiroshima	3,405,571
Gumma	40,110	Yamaguchi	4,596,097
Saitama	1,760	Tokushima	1,762,941
Chiba	13,454,803	Kagawa	934,449
Tokyo	12,428,381	Ehime	5,111,209
Kanagawa	2,789,864	Kochi	2,380,099
Niigata	797,378	Fukuoka	3,663,323
Toyama	2,735,894	Saga	1,087,258
Ishikawa	1,510,616	Nagasaki	6,842,472
Fukui	1,119,349	Kumamoto	1,710,143
Yamanashi	2,292	Oita	1,880,572
Nagano	130,586	Miyazaki	1,197,717
Gifu	50,489	Kagoshima	4,957,100
Shizuoka	12,233,923	Okinawa	1,076,545
Aichi	5,058,191		
Mie	4,282,342	Total	215,861,182 a/
Shiga	54,158		

Source: Nippon Suisan Nempô, 1938

a/ This is slightly higher than the total given in Table 38.

16-031 P146 bu

TABLE 40

Value of Manufactured Fishery Products For Food
(1,000 yen)

	Total	Fushi[a]	Dried	Salted and Dried	Boiled and Dried	Salt Cured	Smoked	Miscellaneous[b]
1935	137,472	14,314	22,306	10,040	22,547	11,859	289	56,117
1936	156,144	17,525	27,264	10,527	23,469	14,559	402	62,398
1937	163,024	16,948	27,124	10,103	21,999	19,313	438	67,098
1938	199,097	17,251	36,103	13,028	28,744	30,073	614	73,282
1939	309,811	29,477	69,421	20,656	48,852	45,635	718	95,052
1940	369,472	35,069	80,417	29,738	63,840	27,837	730	131,841

Source: Statistical Abstract of the Ministry of Agriculture and Forestry; Toyo Keizai Nenkan, 1943.

a/ Fish meat steamed and dried.
b/ Includes fish boiled down in soy, dried seaweed, etc.

TABLE 41

Methods of Processing Used for Some Important Marine Products

sardine	For food: drying, boiling and drying, salting, salting and drying, canning. Other: processing into meal and oil.
salmon	salting (chiefly chum salmon), drying, canning, freezing, smoking.
cod	salting, salting and drying, drying, smoking, canning (boiled codfish and smoked codfish in oil).
buri (yellowtail)	salting.
mackerel	salting, salting and drying, drying (steaming and drying).
tuna	drying (steaming and drying), canning.
bonito	drying (chiefly for katsuobushi but also for other products).
crab	canning.
swordfish	freezing.
abalone	drying, canning.
scallops	freezing, drying.
cuttlefish	drying.
seaweed	drying.

16-031 P148 bu

Persons Employed. Official figures show 207,536 employees and 60,452 employers engaged in processing of marine products in 1940 in Japan. Approximately half of these were employed but part-time in this work (Table 42). The largest number of these were fishermen who also engaged in simple processing -- the drying or salting of fish and the drying of seaweed.

TABLE 42

Persons Engaged in Processing Marine Products, 1936 - 1940

	Employers	Employees		
		Male	Female	Total
Principal Occupation				
1936	24,924	53,658	52,018	105,676
1937	24,441	54,965	54,263	109,228
1938	24,375	52,009	49,010	101,019
1939	24,374	50,867	49,771	100,638
1940	26,124	50,636	54,914	105,520
Subsidiary Occupation				
1936	40,294	36,908	69,501	106,409
1937	36,863	35,175	65,607	100,782
1938	36,953	34,356	65,997	100,353
1939	35,580	32,158	64,701	96,859
1940	34,328	32,662	69,354	102,016

Source: Toyo Keizai Nenkan, 1943.

Although breakdown by type of processing is not available, one source gives the number of persons in Japan proper working in canneries (all types, but fish canning is a principal type of canning in Japan) as 20,700 in 1938 and the number producing aquatic products as 17,400.

16-031 P149 bu

These figures probably cover those working in large units but not the large number of small-scale processors. Table 43 summarizes the data available concerning the factory operations.

TABLE 43

Processing of Fishery Products in Factories, 1938

	Canneries	Production of Aquatic Products
Number of factories	642	2,008
Number of operatives	20,700	17,400
Production		
Total, million yen	105 a/	55
Per factory, thousand yen	164	27
Per operative, yen	5,720	3,160
Working hours, million	59.1	36.0
Wages, million yen	5.6	4.5
Raw material consumed, million yen	151.3	34.7

Source: Orient Yearbook, 1942.

a/ Products of fish and shellfish canning were according to the same source valued at 38 million yen in this year -- more than one-third of the total. Other sources give a much higher production figure for canned fishery products (Table 46).

Drying, Salting and Smoking

About 65 percent of the value of fishery products processed for food was dried, salted or smoked fish (Table 40). Drying, salting and, to a lesser degree, smoking are important in Japan; together with fresh fish, the products processed in these ways formed the bulk of the marine products consumed domestically. Although in the large cities, especially among higher income groups, frozen and canned fish had become familiar items, in the villages and towns and among the masses

16-031 P150 bu

in the cities dried and salted fish prevailed and the traditional Japanese cuisine rested upon these products and fresh fish.

Drying included several different techniques: plain drying, boiling and drying, and the steaming and drying of fish meat ("fushi"). Some of the dried fish was flavored before being marketed. These drying methods were used for numerous species including sardines, cod, mackerel, tuna and bonito, cuttlefish and abalone and other shellfish.

The Japanese production of salted fish is classified as "salt-cured" and as "salted and dried." Salting-curing was used for salmon, trout, sardines, cod, yellowtail, mackerel and other species. A combination of salting and drying was also in common use, especially for sardines, mackerel and cod.

Smoking of fish was less common than drying and salting, but was locally important. In a district near Otaru, Hokkaido, for example, salmon was smoked in considerable quantities.

These methods of processing were widespread throughout Japan — from Hokkaido to southernmost Kyushu. Most of the processing was done by those engaged in fishing whether large companies or individuals. In the Soviet waters, Nichiro Gyogyo K. K. salt cured salmon, but thousands of small fishermen who worked the coastal waters also salted and dried fish. The "factory" in some cases was no more than the beach where fish were laid out to dry; sun-drying was characteristic of the smaller fishing villages throughout Japan.

16-031 P151 bu

Freezing

Production of frozen fish which started in the late 1920's has increased greatly in recent years. But even though Japan's freezing, cold storage and refrigerating industry was developed chiefly to be used for fish and shellfish, freezing was still a small industry. According to one source about 60,000 tons of fish were frozen annually -- only about one percent of the total catch. 60/

In 1933 Japan proper is reported to have had 88 freezing plants with a total daily capacity of 860.5 tons (Table 44). Of these, 59 used air (ordinary sharp freezers) and 29 used brine in one manner or another. In addition to these freezing plants in Japan proper, there were four in Kamchatka (plants of Nichiro Gyogyo K. K.) and eighteen on fishing vessels in 1935. Some of these vessels (chiefly trawlers although several "freezing tender ships" of 300 - 1,000 tons) froze fish during the summer months and then docked at Tokyo or other large ports to serve as cold storage depots during the winter months. The total number of freezing plants as of the prewar period may be placed at more than 100 but capacity figures are not available for later than 1933-34 (Table 44).

Canning

Canning was an important method of processing for the export market, but only small amounts of canned fish entered into domestic consumption. It was developed as a means of obtaining foreign exchange

60/ Japan's Fisheries Industry 1939 (Special issue of Japan Times and Mail, 1939).

TABLE 44

Freezing Plants and Capacities

	1933-34	1935-
Japan Proper		
Number of plants	88	-
Capacity (tons)	860.5	
Kamchatka		
Number of plants	2	4
Capacity (tons)	30	40
On vessels		
Number of plants	15	18
Capacity (tons)	45	30
Total		
Number of plants	103	-
Capacity (tons)	935.5	-

Source: Japan's Fisheries Industry 1939 (Special issue of Japan Times and Mail, 1939).

particularly to enable the purchase of industrial raw materials abroad. Because of its commercial importance and large-scale production methods far more information is available concerning the canning of fish than concerning the other processing methods. It should be kept in mind therefore, that despite the details presented concerning canning it is not a leading processing method for the domestic market.

In prewar years Japan produced 5 to 7.7 million cases 61/ of canned marine products valued at 100 - 125 million yen. Approximately 70 percent of this production was for export markets 62/. Salmon, sardines, crab, tuna, mackerel and bonito constituted the bulk of the pack although lesser quantities of herring, shellfish, crustaceans, fish paste and even whalemeat were canned (Table 46).

The Japanese fish canning industry was distributed as follows: 63/

Salmon: Kamchatka, floating canneries, the Kuriles, Hokkaido and northern Honshu.

Crab: Floating canneries (chiefly off Kamchatka) and land canneries in Kamchatka.

Sardine: 64/ Chiefly southern Hokkaido and Aomori Prefecture.

Tuna: Chiefly Shizuoka, Kanagawa, Chiba and Miyagi prefectures.

61/ A case is equal to 48 pounds.

62/ Various sources give figures ranging from 60 - 80 percent. Some canned fish exported directly from floating canneries does not enter into the export statistics but are reported as included in Table 45, which shows that in the period 1930 - 1937 the percentage exported varied from 60 to 83 percent.

63/ Further details are given in the following sections which discuss the canning by types.

64/ Also Korea.

18-031 P154 bu

TABLE 45

Production and Export of Canned Marine Products [a]

	Production (cases) [b]	Exports (cases) [b]	Percentage Exported
1930	2,779,266	1,657,342	60
1931	2,137,111	1,307,097	61
1932	2,664,401	1,939,301	73
1933	3,389,087	2,821,076	83
1934	4,297,113	2,914,901	68
1935	4,921,868	3,158,915	64
1936	5,486,160	3,949,725	71
1937	7,735,009	5,103,998	66
1938	n.a.	n.a.	n.a.
1939	6,680,613	n.a.	n.a.

Source: Japan's Canning Industry Since 1930, 1938.
Figure for 1939 from consular report.

n.a. - not available.

a/ Includes Japan proper, Karafuto, Korea, Kamchatka and floating canneries. Korean production amounted to about 150,000 - 200,000 cases in the period 1933 - 1936.
b/ Cases of 48 pounds.

16-031' P155 bu

TABLE 46

Japanese Production of Canned Marine Products

	1937		1939	
	1,000 cases	1,000 ¥	1,000 cases	1,000 ¥
Salmon	2,524	50,953	2,438	58,663
Crab	508	24,423	599	30,140
Tuna	660	8,646	378	5,275
Mackerel	550	4,198	205	1,812
Bonito	285	2,280	225	2,250
Sardine	2,067	13,463	1,550	10,357
Whalemeat	-	-	40	554
Scallop	32	672	28	644
Clam	30	169	244	2,275
Oyster	3	24	3	25
Abalone	43	774	42	819
Shrimp	5	130	7	210
Eel	12	265	23	667
Squid	15	128	13	117
Octopus	17	140	15	165
Fish and other marine paste	75	662	19	152
Herring	a/	a/	95	950
Other	909	11,107	75	10,117
Total	7,735	118,034	6,681	125,192

Source: Consular Report, "Production of Canned Marine Products in Japan Proper," Tokyo, May 8, 1940.

Note: 1938 figures not available.

a/ Not reported separately.

16-031 Pt56 bu

Salmon Canning. About one-third of the Japanese salmon catch is canned to provide an annual pack of more than two million cases during the years 1934 - 1939 (Table 47 and Appendix A). This is almost one-fourth of the world's commercial salmon pack.

Approximately one-half of the salmon pack was from canneries in the Soviet area and about 12 - 15 percent from floating canneries. The rest was divided among plants in the Kuriles, Hokkaido, Karafuto and northern Honshu (Table 47). The location of canneries operating in the Russian area and the northern Kuriles and of floating canneries is shown in Figure 8. Hokkaido plants are reported in Hakodate, Nemuro and Kitami. On Honshu the largest concentration of salmon canning plants was in the area around the city of Aomori on the Gulf of Mutsu. Table 47 shows a total of 94 plants operating in 1936; in 1938, 99 were operating. 65/

TABLE 47

Japanese Canned Salmon Pack, 1936

	Number of Canneries Operated	Production (cases)
Soviet Waters (Kamchatka and Okhotsk)	22	1,094,797
Floating Canneries	3	281,540
Karafuto	9	19,046
Kuriles:		
Northern Kuriles	11	529,709
Etorofu	7	77,338
Japan proper		
Hokkaido	24	127,446
Tohoku (northern Honshu)	18	163,017
Total	94	2,292,893

Source: "The Fishing Industry of Japan," Office of Strategic Services, June 1942.

65/ Appendix A gives the details of the 1936 production, i.e. output by factories and the breakdown by type over a period of years.

The largest part of the Japanese salmon pack was pink salmon; of the 1940 production 61 percent was of this species. Red salmon constituted the second largest pack and silvers, chum and kings made up the remaining portion (Appendix A).

The season of salmon packing was summer varying somewhat, however, with the species and the locality. In general the season for pink salmon was July and August with the peak in late July; for red salmon mid-June to mid-August with the peak the last week of June in eastern Kamchatka and the last week in July in western Kamchatka; for silver salmon from early August to mid-September with the peak in late August; and for chum (ketas) the months of July and August with the peak in late July.

The packing of salmon was as modern well-equipped industry. The fins and heads of the fish were cut off by machines and the gutting and the cutting into pieces for cans were also done mechanically. The pieces of fish were then packed into cans, salt added, and after sealing, the filled cans were heated. Later they were cooled and packed. Much of the canning process was done automatically with conveyor belts, regulated chargers and other modern equipment.

Crab Canning. The total annual production of canned crab in the years immediately before the war reached about 500,000 - 600,000 cases valued at ¥ 24 - 30 million (Tables 48 and 49 and Appendix A). 66/

66/ During the war period production of canned crab has been greatly curtailed. As early as 1939 plans were made to reduce the output (because of the ban on import by foreign countries) and for the 1940-41 season floating canneries were instructed by the Ministry of Agriculture and Forestry to cut production by 40 percent and the Association of Canned Crab Manufacturers on Land planned to cut 32 percent. Since 1942 the commandeering of vessels has reduced if not entirely eliminated this production.

16-031 P158 bu

This included the pack of several species, but almost 90 percent of the pack was taraba or king crab. 67/ Japan's crab canneries numbered 51 in a recent year, located as follows: 27 in Hokkaido and the Kuriles, 3 in Karafuto, 9 in Russian territory, 8 factory ships and 4 at "other places." 68/ Locations of those in the northern area operating in 1940 are shown in Figure 8. The production by districts (Table 48) indicates that slightly more than half of the total production in recent years was from floating canneries and that the Kuriles, Karafuto, Hokkaido and Kamchatka each produced approximately one-eighth of the total. 69/ Table 49 with somewhat different figures is included because it gives a further breakdown of the production by districts and Appendix A contains more details of past production.

Crab canning was also seasonal -- from March or April to September. The crabs were processed by first removing the back shell and then boiling or steaming for about 15 or 20 minutes. Dipped in clean water to be cooled they were then cleaned and the flesh pulled from the body and legs. The meat was classified according to quality and condition, then packed in accordance with standards laid down by government regulations into cans of several sizes. Modern equipment characterized both the land canneries and the factory vessels.

67/ Much of the statistical information concerning the Japanese crab pack does not distinguish between figures for all species and those for taraba, the chief species packed. Frequently the figures are only for the latter.

68/ In addition there were 10 crab canneries operating in Korea. Some of the canneries can both salmon and crab and are thus counted twice in the data given.

69/ There was considerable variation from year to year but as a general statement this is true.

16-031 P159 bu

TABLE 48

Canned Crab Production of Japan a/
(Cases)

	1935-1936	1936-1937	1937-1938	1938-1939
Karafuto	19,169	22,994	42,780	43,047
Hokkaido and Kuriles				
Nemuro	44,011	39,940	35,577	25,680
Wakkanai	2,536	446	9,291	8,749
Esashi	2,048	-	-	3,821
Rishiri	453	-	-	5,277
Monbetsu	3,893	5,985	9,345	4,301
Abashiri	5,198	3,297	3,716	-
Akkeshi	3,921	2,400	-	-
Kushiro	3,093	4,637	916	-
Ochiishi	11,276	9,394	5,012	-
Kiritappu	5,838	4,116	2,358	-
Tokachi	200	-	-	-
Etorofu	7,543	5,523	2,033	432
Kita-Chishima	36,181	56,182	64,669	38,106
Shiriushi	-	-	-	256
Mainland of Japan	28	45	12	-
Korea	24	79	-	-
Kamchatka	7,344	49,558	53,675	31,139
Floating canneries	183,923	204,719	253,902	204,200
Total	336,679	409,315	483,286	365,008

Source: Consular report, "Economic and Trade Note No. 140," Tokyo, December 19, 1939. Submitted by Donald Lemm, Assistant Trade Commissioner.

a/ Figures reported by Hakodate office of Japan Canned Crab Association stated that these figures are based on calendar year but they are thought to be based on production year. Data is probably for king crab only.

16-031 P160 bu

TABLE 49

Canned Taraba Crab Output, 1938
(Cases)

District	Production	Percent
Karafuto	42,780	8.17
Nemuro	42,080	8.04
Wakkanai	9,291	1.77
Monbetsu	16,873	3.22
Abashiri	5,261	1.01
Kushiro	1,687	0.32
Mutafu	4,616	0.88
Otchishi	8,972	1.71
Northern Kuriles (Kita-Chishima)	69,453	13.27
Etorofu	2,517	0.48
Japan Proper	12	-
Kamchatka	55,019	10.51
Floating factories a/	264,956	50.62
Total	523,517	100.

Source: Japan's Export Trade and Industry, published by Osaka Mainichi, Osaka, October 25, 1939.

a/ Eight floating canneries were operated, seven on the west coast and one on the east coast of Kamchatka.

16-031 P161 bu

Tuna Canning. A part of the tuna catch is canned; some estimates place it as high as a quarter of the catch but others place it at about 10 percent. In 1937 the canned production was 660,000 cases and in 1939 378,000 cases (Table 46); similar fluctuations occurred in the period 1932 - 1936 and prior to 1932 production was very small.

Tuna canning districts were mainly in Shizuoka, Miyagi, Kanagawa and Chiba prefectures. This is indicated by Table 50 showing the location of the 29 canneries operating in a recent year. 70/ The plants were in districts facing the Pacific -- conveniently situated near the tuna fishing grounds. At least one of the largest tuna factories was in the city of Shimizu. 71/

TABLE 50

Tuna Canneries in Japan a/

	Number of Canneries
Shizuoka	14
Miyagi	5
Kanagawa	4
Chiba	3
Ibaraki	1
Tokyo	1
Fukushima	1
	29

a/ In addition one cannery was operating in Formosa.

70/ Either 1937 or 1938.
71/ This plant has been reported to be producing during the war period exclusively for the Army.

In general tuna canning was during the spring and summer months but it was not completely confined to these seasons. In Shizuoka and Kanagawa prefectures two canning seasons are reported: the first from early January to late March and the second from early May until July with June as the peak season. In Miyagi Prefecture the season was later -- from June to August with mid-June the busiest period.

Tuna canneries, all established relatively recently, were equipped with modern machinery — automatic cutters, automatic vacuum sealing machines, automatic cooling apparatus, etc. The process was similar to that used in the United States. The heads were cut off and internal organs removed and, after washing, the tuna were steamed for several hours. They were then cooled and bones, scales and other inedible parts removed, leaving only the meat (about 40 percent by weight of the fish as landed) which was cut up and packed in cans. The meat was then classified into grades according to type of meat (white meat made of "binnaga" tuna and light meat made of various kinds) and type of pack (solid, standard and flake). The finished product was inspected by the Tuna Packers' Association of Japan.

Sardine Canning. Of the total annual haul of sardines only a small fraction (about 2 percent) was used for canning and about 80 percent of the canned product was exported. Thus although 1½ to 2 million cases were produced (Table 51) less than 500,000 cases were consumed domestically. Most of the sardines canned were packed in tomato sauce (Table 51).

TABLE 51

1937 Production and Export of Japanese Canned Sardines

	Production (Cases)	Export (Cases)
In tomato sauce	1,381,403	1,325,504
In oil	31,070	29,997
Natural	171,054	155,228
Peppered	128,955	110,795
Seasoned	355,000	13,715
Total	2,067,482	1,635,239

Source: Japan's Fisheries Industry 1939 (Special issue of Japan Times and Mail, 1939).

Sardines were canned chiefly in southern Hokkaido and in Aomori Prefecture. 72/ Recent data concerning the location of factories are not available, but in 1932 there were 13 in Hokkaido, three in Aomori Prefecture, two each in Nagasaki and Yamaguchi prefectures and one each in Osaka and Kyoto prefectures. 73/

The sardine packing season reached its height in Hokkaido and Aomori in November and December although starting in early September. In Nagasaki and Yamaguchi the season was later -- December to April with January and February as the peak months.

Shellfish Canning. Several kinds of shellfish were canned in Japan, but the total production was only about 180,000 - 300,000 cases (Tables 46 and 52) and about half of this was exported. The last two species listed in Table 52 (sazae and akagai) were produced mainly for domestic consumption.

72/ Also in Korea; in 1932 five factories were operating in Korea.
73/ Those in Osaka and Kyoto packed sardines in oil; the others in tomato sauce.

TABLE 52

Output of Canned Shellfish, 1937
(Cases)

Hotate (scallop)	32,000
Hokki	9,500
Asari (baby clam)	19,595
Hamaguri (clam)	4,609
Asari and Hamaguri (seasoned)	25,000
Kaki (oyster)	3,326
Awabi (abalone)	43,000
Sazae (Turbo species)	45,000
Akagai (Anadara inflata)	15,000
	197,030

Fish Meal Production

Fish meal for fertilizer and feed 74/ were manufactured in considerable quantities. Official statistics of the Ministry of Agriculture and Forestry show annual production of fertilizer as varying from 375,000 to 450,000 tons (Table 53). Other sources place the production for fertilizer and feed at 600,000 tons (Table 54). Sardines, herring and codfish supply the largest part of the production; in 1937 sardines accounted for more than two-thirds of the total. Normally a sizeable part of the herring and sardine catches entered directly into this production although some of the fertilizer was made from fish scrap. During the war period production has dropped with the diversion of these products to food uses; 1942-43 production of fertilizer has been estimated at 200,000 metric tons.

74/ Small amounts are used for human food.

16-031 P165 bu

TABLE 53

Fish Fertilizer Production
(Quantity in 1000 kan; value in 1000 yen)

	1934	1935	1936	1937	1938
Total					
Quantity	113,071	99,866	120,298	88,985	64,050
Value	28,913	28,552	37,474	33,115	28,990
Herring cake, value	3,319	1,679	1,024	973	960
Sardine cake, value	19,536	18,157	26,715	21,545	18,814
Fish bone cake, value	969	945	1,220	1,688	2,710
Sardine dried, value	1,006	1,194	857	359	430
Herring dried, value	2,163	1,688	1,893	1,370	737
Others, value	1,917	4,836	5,764	7,178	5,337

TABLE 54

Production of Fish Meal, 1937 a/
(metric tons)

Sardine	430,127
Herring	27,807
Codfish	10,286
Whale	8,509
Flatfish	3,225
Others	120,340
Total	600,294

Source: Japan's Fisheries Industry 1939 (Special issue of Japan Times and Mail, 1939). Data compiled by the Fish Meal Producers and Exporters Association of Japan.

a/ These figures are thought to include only Japan proper.

16-031 P166 bu

Two processes were used in making fish meal in Japan: sun-drying and machine manufacture. Although some sources give the impression that sun-drying was largely a method of the past, as late as 1939 it was reported that 90 percent of the total production was sun dried. 75/ In this method of production the raw materials were cooked and sterilized, fat and oil extracted by hand presses, and the resulting material was then sun-dried and ground. This type of manufacturing was done in small units; it was really a household industry.

In contrast, in the modern method the materials were handled by machine from start to finish. The continuous machine producer consisted of a cooker, a screw press (for the removal of water and fat), a dryer equipped with a steam jacket, a grinder and a collector, all of which worked in combination. A few of the large plants recently installed are reported to be capable of processing a thousand pounds of raw material daily. Most fish meal plants of Japan had much lower capacities. 76/ Capacity production was reached only at times when the catches of sardines and other fish were abundant.

In 1936 there were reported to be 65 plants producing fish meal including plants in Karafuto, Korea and Soviet territory. 77/ Within Japan proper the leading centers for fish meal production were Hakodate,

75/ The Japan Trade Guide, 1940. This figure may be too high, but large amounts are still processed by sun-drying.
76/ According to the Japan Trade Guide, 1940 the average capacity of plants producing machine-made meal is about 10 - 20 tons daily.
77/ According to another source in 1937 Korea alone had more than 144 sardine pressing plants producing oil and meal. Many of these, however, were very small.

Otaru and Muroran on Hokkaido and Yokohama, Kobe, Yokkaichi and Shimonoseki on Honshu. The small units producing sun-dried meal were, however, widespread; in general, where transportation facilities were not good or where there was no satisfactory equipment for mamufacturing them into food, fish were converted into fertilizers.

The fish meal production, i.e. the commercial industry, was controlled by a government-sponsored Fish Meal Producers and Exporters Association.

Fish Oil Production

Approximately 90 percent of the animal fats and oils and 30 percent of the total fats and oils produced in prewar Japan was from fish and other marine animals. In the period 1934 - 1938 annual production varied from 62,200 to 112,800 metric tons and averaged 83,800 metric tons (Table 55).

TABLE 55

Fish Oil Production in Japan a/

	Quantity (kan)	Value (yen)
1934	22,037,028	8,702
1935	16,595,515	8,793
1936	30,079,000	21,527
1937	24,437,345	18,001
1938	20,428,790	13,138

Source: Japan-Manchukuo Yearbook, 1940.

a/ These figures appear to include Japan proper and Karafuto. Production of Korea and Formosa is not included.

16-031: P168 bu

The production in 1936 was about equally divided between the three islands of Honshu, Shikoku and Kyushu, on the one hand, and Hokkaido and Karafuto on the other. One source giving slightly different figures than those in Table 55 reports that of the 105,902 tons of fish oils produced in 1936, 53,700 tons were produced in the three islands, 46,400 tons in Hokkaido and 5,800 tons in Karafuto. 78/

Sardines provided the bulk of the marine oil production, about three-fourths of the production by value (Table 56). The largest part of this production is from whole fish in reduction plants where meal is a joint product.

TABLE 56

Production of Fish Oils by Type in Japan
(yen)

Year	Total	Sardine	Herring	Cod	Whale a/	Shark	Others
1934	8,702,511	6,416,967	358,551	375,857	408,137	431,096	711,903
1935	8,792,502	6,687,986	165,421	471,265	545,921	724,479	197,431
1936	21,527,114	16,112,027	361,868	1,006,645	2,371,291	1,026,241	649,042
1937	18,001,508	14,272,777	170,818	849,508	1,151,017	947,754	609,834
1938	13,138,868	9,700,667	372,628	641,250	892,373	1,063,795	468,155

Source: Japan-Manchukuo Yearbook, 1940.

a/ Does not include oil from Antarctic catch.

Complete information concerning the location of fish oil plants is not available but plants were known to be producing in the following places: Hakodate and Sapporo in Hokkaido, Kashiwazaki (Niigata Prefecture), Ube (Yamaguchi Prefecture), Fukuoka and Omuda (Fukuoka Prefecture),

78/ Japan's Fisheries Industry 1939 (Special issue of Japan Times and Mail, 1939). These figures do not include whale oil.

16-031 P169 bu

Nobeoka (Miyasaki Prefecture), Sendai (Miyagi Prefecture) and Niihama, Ehime and Kochi (Kochi Prefecture). 79/ There were also about a dozen producers of hardened oils (largely fish oils) most of which also produced soap. Normally soap was the principal domestic outlet for hardened fish oil but they were also used for food. 80/

Seaweed Processing

Much of the processing of seaweed was simply that of drying the raw material to be used either as food or for fertilizer (see pages 103 - 107). Other seaweeds, however, undergo more complicated manufacture such as the Gelidium species manufactured into agar-agar.

Japanese statistics claim a production of about 25,000 tons of agar-agar (Table 57). Most of this was made from a mixture of several species of Gelidium (chiefly Gelidium amansi) which was bleached in the sun, then pounded to remove the limy elements and again bleached. This was followed by a 10-hour boiling period during which the agar-agar jelly was dissolved out of the seaweed and put into moulds for congealing. This was then cut into shapes, frozen, drained and air-dried. Agar-agar which was marketed in four forms (bars or squares, strips, powder and "paper") was used in the Far East as a food but in the United States and Europe as a base for the culture of bacteria, in drugs, as a substitute for gelatin or pecten in making puddings and jelly, in starching material

79/ Report of interview with A. R. Goedicke. He reports plants in Korea at Rashin, Seishin, Joshin, Konan and Fusan.

80/ Japanese Trade Studies, Special Industry Analysis No. 15 Fats, Oils and Oil-Bearing Materials (U. S. Tariff Commission), May 1945.

16-031 P170 bu

for textiles and for clarifying beer and wine. In prewar years a large part of the Japanese production was exported.

TABLE 57

Agar-Agar Production

	Number of Establishments	Production	
		Quantity (kan)	Value (yen)
1934	449	618,841	5,257,378
1935	463	665,000	6,390,315
1936	512	680,000	9,712,497
1937	520	708,203	10,122,783
1938	528	687,731	11,142,642

Source: Japan-Manchukuo Yearbook, 1940.

Manufacture of Other Marine Products

Other manufactures from marine products included vitamin oils from fish livers, pearls, coral and shell buttons and iodine potassium and other chemicals. The manufacture of leather from shark was another minor industry which had developed in recent years.

The cod liver oil industry, the earliest of the vitamin oil industries was some years ago practically confined to Karafuto where 10 small plants accounted for 90 percent of the production. The remainder was produced in a few small islands off Hokkaido.

Recent information concerning the manufacture of vitamin oil is fragmentary. Tuna liver oil for vitamin concentrates was reported produced in Muroto, Kochi Prefecture and three small plants making vitamin oils were operating in the Tokyo area. 81/

81/ Hayashikane Shoten on island in Tokyo River, Mitsui Company at northern edge of Tokyo and a company near Shinagawa according to Mr. Ridlon of Atlantic Coast Fisheries.

IV. MARKETING AND CONSUMPTION

Domestic Marketing and Consumption

Domestic Marketing. Little information is available concerning domestic marketing of marine products. Only the few general statements given here can be made and even these cannot be fully substantiated with details.

Japanese statistics placed the value of marine products consumed domestically in prewar years at ¥ 440,000,000. No figures are available for the volume consumed, but the total domestic disappearance of fish, shellfish, crustaceans and molluscs (in terms of the fresh products) may be estimated at three million tons annually for years immediately preceding the war. Of this amount about 2.2 million tons were consumed as food and the remainder processed into fertilizer and oil.

The larger commercial fishing operators sold domestically to the city markets whereas the village fishermen sold chiefly to the small towns and villages. There were, however, exceptions to this general statement for some groups of village fishermen sold into urban markets.

In the coastal fishing areas distribution to many families was simple -- the fisherman's family ate part of the catch. The major part of the production, however, was transported to markets either by the fishermen themselves or by brokers who went to the coastal villages for the purpose of collecting the products. Some of the small village fishermen sold ccoperatively through their village societies (gyogyo kumiai); other fishermen contracted to sell all their catch to companies. The

16-031 P172 bu

latter type of marketing was done chiefly in cases where the product was to be canned or otherwise processed and was not very common among fishermen who were producing for domestic consumption.

Fish markets were located in both the productive coastal districts and in the large consuming cities. The total number of fish markets in Japan in 1934 was 934; in addition 253 markets selling fruits and vegetables also handled fish. Thus, there were 1,187 markets handling fish throughout Japan proper in 1934. The ownership of some markets was public, of others private and of still others cooperative. The public markets were municipally operated, most of the private ones were operated by fishery companies and most of the cooperative markets were small ones operated by village fishery associations in the coastal areas.

In 1923 the Central Wholesale Market Law provided for the establishment of markets for fresh foodstuffs (fish, vegetables and fruits). Under this law markets were to be established first in the large urban centers and later in all cities with populations of 100,000 or more. Such central wholesale markets were established in Tokyo, Yokohama, Kobe, Osaka, Kyoto, Kochi, Kagoshima and Sasebo, but apparently none were established in other cities. These central markets were modern with excellent facilities for handling, sales and storage. Space was rented to wholesalers who, conducting their business on a commission basis 82/, sold to brokers who, in turn, sold to retail dealers. The value of fish sold in the city

82/ In prewar years the commission received by wholesalers was about 10 percent.

16-031 P173 bu

markets of five of the large cities is given in Table 58. In prewar years the Tokyo central market is reported to have handled 750 tons daily and the Osaka market about 630 tons.

The retailing of fish in the cities and towns was largely through stores. In Tokyo, for example, more than 4,000 stores handled fish in 1935. In the rural areas fish was peddled daily by fish mongers.

In order to provide the large cities with fresh fish, special daily trains were operated between major producing areas and the city markets. For example, fish was quickly dispatched from Shimonoseki, the trawling base, to Kobe, Osaka, Kyoto and Tokyo and from Choshi to Tokyo. In 1937 more than 610,000 tons of fresh fish and 280,000 tons of salted and dried fish were moved on the Japanese railroads. The amounts carried by months in each of the railroad bureaus is given in Table 59.

Prices. Prices of fish and other marine products in Japan during the prewar period are available for only a few items as sold in Tokyo. The wholesale and retail prices for these items are given in Table 60, not as any indication of present prices for the 1945 level is well above that of 1933 - 1935, but as indications of the relative prices of these items. These figures, as yearly averages, do not show the considerable seasonal fluctuation in prices resulting from seasonal differences in supply and seasonal changes in flavor and areas of production. Table 61, giving high and low prices by months for 1937, indicates the seasonal fluctuations in price characteristic of many fish products. The market

16-031 P174 bu

TABLE 58

Value of Fish Sold in Major City Markets of Japan, 1937
(1,000 yen)

	Tokyo		Osaka		Kobe		Kyoto		Yokohama	
	Fresh	Salted and Dried	Fresh	Salted and Dried	Fresh	Salted and Dried	Fresh	Salted and Dried	Fresh	Salted and D
January	3,468	1,250	2,237	1,645	853	310	796	411	314	15
February	3,069	1,081	2,373	1,127	809	272	739	404	321	15
March	3,546	1,447	2,655	1,319	880	320	848	503	385	16
April	3,574	942	2,694	1,209	909	296	889	474	386	1
May	3,393	1,031	2,762	1,267	937	321	902	478	385	14
June	3,002	956	2,266	1,327	756	309	663	396	354	11
July	2,794	763	2,114	1,256	698	265	592	317	339	11
August	2,575	788	1,953	856	682	281	560	311	345	12
September	3,066	973	2,439	1,277	728	440	620	438	346	12
October	3,395	1,153	2,466	1,905	691	416	626	541	389	14
November	3,711	1,351	2,627	1,857	822	556	697	571	407	20
December	4,255	1,845	3,475	2,568	1,085	571	988	676	427	31
Total	39,855	13,585	30,066	17,618	9,855	4,364	8,926	5,525	3,676	1,

Source: Nippon Suisan Nempô, 1938.

TABLE 58

Value of Fish Sold in Major City Markets of Japan, 1937
(1,000 yen)

Tokyo		Osaka		Kobe		Kyoto		Yokohama	
Fresh	Salted and Dried	Fresh	Salted and Dried	Fresh	Salted and Dried	Fresh	Salted and Dried	Fresh	Salted and Dried
3,468	1,250	2,237	1,645	853	310	796	411	314	154
3,069	1,081	2,373	1,127	809	272	739	404	321	155
3,546	1,447	2,655	1,319	880	320	848	503	385	160
3,574	942	2,694	1,209	909	296	889	474	386	122
3,393	1,031	2,762	1,267	937	321	902	478	385	144
3,002	956	2,266	1,327	756	309	663	396	354	112
2,794	763	2,114	1,256	698	265	592	317	339	114
2,575	788	1,953	856	682	281	560	311	345	121
3,066	973	2,439	1,277	728	440	620	438	346	122
3,395	1,153	2,466	1,905	691	416	626	541	389	149
3,711	1,351	2,627	1,857	822	556	697	571	407	309
4,255	1,845	3,475	2,568	1,085	571	988	676	427	311
39,855	13,585	30,066	17,618	9,855	4,364	8,926	5,525	3,676	1,893

Nippon Suisan Nempô, 1938.

TABLE 59

Volume of Fish Carried by Railroads in Various Districts a/
(tons)

	Tokyo	Nagoya	Osaka	Hiroshima	Moji	Niigata	Sendai	Sapporo	Tota
					Fresh Fish				
January	2,239	2,597	2,671	11,651	10,821	2,826	6,701	4,117	43,6
February	3,769	2,435	4,796	8,351	9,370	1,056	4,929	5,082	41,7
March	4,747	2,638	7,548	10,517	12,814	2,601	4,922	3,213	49,0
April	4,487	7,909	10,266	8,970	11,038	1,188	3,900	13,762	61,5
May	6,815	5,949	5,999	9,709	9,032	628	6,854	2,343	47,3
June	4,325	7,084	6,675	10,171	7,085	1,705	10,262	2,209	49,5
July	2,038	4,606	1,912	10,961	5,026	594	16,383	3,288	44,8
August	1,444	1,170	1,086	9,307	3,179	499	19,697	2,987	39,3
September	1,261	1,059	1,193	10,567	5,312	251	21,900	6,085	47,6
October	2,061	1,501	2,466	17,051	9,991	243	23,353	9,004	65,6
November	3,456	1,950	2,896	19,961	10,890	190	13,524	7,816	60,6
December	4,707	2,108	2,439	18,597	10,821	2,388	10,479	7,734	59,2
Total	41,349	41,006	51,947	145,818	105,379	14,169	142,904	67,640	610,2
					Salted and Dried Fish				
January	4,008	522	364	1,898	1,225	442	3,869	6,072	18,40
February	3,043	635	288	919	1,074	278	1,383	5,782	13,40
March	2,849	837	367	1,084	1,773	548	794	4,427	12,67
April	5,105	1,480	444	486	1,280	1,104	4,472	16,369	30,74
May	3,277	837	690	856	1,299	408	1,659	12,981	22,00
June	1,018	896	700	1,503	926	82	2,604	18,683	26,41
July	266	581	393	1,274	907	206	3,297	19,846	26,77
August	443	482	763	2,609	1,568	111	6,138	19,218	31,33
September	566	1,338	756	1,517	1,839	275	8,311	9,723	24,32
October	924	1,702	1,325	2,613	2,188	1,131	9,060	9,858	28,80
November	2,675	901	1,323	2,806	1,359	376	5,864	8,460	23,76
December	6,208	1,218	783	3,789	1,992	435	4,989	5,761	25,17
Total	30,382	11,429	8,196	21,354	17,430	5,396	52,440	137,180	283,80

Source: Nippon Suisan Nempo, 1938.

a/ The Districts are "railroad bureaus." The data are probably for 1937.

TABLE 59

Volume of Fish Carried by Railroads in Various Districts a/
(tons)

	Tokyo	Nagoya	Osaka	Hiroshima	Moji	Niigata	Sendai	Sapporo	Total
					Fresh Fish				
anuary	2,239	2,597	2,671	11,651	10,821	2,826	6,701	4,117	43,623
ebruary	3,769	2,435	4,796	8,351	9,370	1,056	4,929	5,082	41,788
arch	4,747	2,638	7,548	10,517	12,814	2,601	4,922	3,213	49,000
pril	4,487	7,909	10,266	8,970	11,038	1,188	3,900	13,762	61,520
ay	6,815	5,949	5,999	9,709	9,032	628	6,854	2,343	47,329
une	4,325	7,084	6,675	10,171	7,085	1,705	10,262	2,209	49,516
uly	2,038	4,606	1,912	10,961	5,026	594	16,383	3,288	44,808
ugust	1,444	1,170	1,086	9,307	3,179	499	19,697	2,987	39,369
eptember	1,261	1,059	1,193	10,567	5,312	251	21,900	6,085	47,628
ctober	2,061	1,501	2,466	17,051	9,991	243	23,353	9,004	65,670
ovember	3,456	1,950	2,896	19,961	10,890	190	13,524	7,816	60,683
ecember	4,707	2,108	2,439	18,597	10,821	2,388	10,479	7,734	59,273
Total	41,349	41,006	51,947	145,818	105,379	14,169	142,904	67,640	610,297
					Salted and Dried Fish				
anuary	4,008	522	364	1,898	1,225	442	3,869	6,072	18,400
ebruary	3,043	635	288	919	1,074	278	1,383	5,782	13,402
arch	2,849	837	367	1,084	1,773	548	794	4,427	12,679
pril	5,105	1,480	444	486	1,280	1,104	4,472	16,369	30,740
ay	3,277	837	690	856	1,299	408	1,659	12,981	22,007
une	1,018	896	700	1,503	926	82	2,604	18,683	26,412
uly	266	581	393	1,274	907	206	3,297	19,846	26,770
ugust	443	482	763	2,609	1,568	111	6,138	19,218	31,332
eptember	566	1,338	756	1,517	1,839	275	8,311	9,723	24,325
ctober	924	1,702	1,325	2,613	2,188	1,131	9,060	9,858	28,801
ovember	2,675	901	1,323	2,806	1,359	376	5,864	8,460	23,764
ecember	6,208	1,218	783	3,789	1,992	435	4,989	5,761	25,175
Total	30,382	11,429	8,196	21,354	17,430	5,396	52,440	137,180	283,807

Source: Nippon Suisan Nempo, 1938.

a/ The Districts are "railroad bureaus." The data are probably for 1937.

TABLE 60

Wholesale and Retail Prices of Fish in Tokyo, 1933 - 1935
(Yearly Average)

	Wholesale Prices (¥ per 10 kan)			Retail Prices (¥ per 10 kan) a/		
	1933	1934	1935	1933	1934	1935
Fresh fish:				n.a.	n.a.	n.a.
Tai (seabream)	62.13	62.31	67.01	36.30	47,40	54.00
Maguro (tuna)	23,36	23,41	20.72	17.3	21.0	22.8
Buri (yellowtail)	12.47	14.37	14.70	10.00	10.70	11.40
Saba (mackerel)	5.75	5.19	7.01			
Salted salmon	11.43	10.68	11.35	13.80	14.40	14.30
Dried bonito b/	121.14	115.65	102.29	123.00	123.10	109.70
Dried cuttlefish	n.a.	n.a.	n.a.	28.70	34.80	43.30
Processed herring cake	4.47	4.28	4.85	n.a.	n.a.	n.a.
Tangle	n.a.	n.a.	n.a.	33.30	39.20	34.40
Dried laver	n.a.	n.a.	n.a.	23,50	22.00	22.10

Source: Annual Statistical Report of the Tokyo Chamber of Commerce and Industry, 1936.

n.a. - not available.

a/ Retail prices were given in terms of units of 375 grams (momme), but converted here for comparative purposes.
b/ The wholesale price for dried bonito was given for katsuobushi and the retail price for "dried bonito (Izu)"; these may not be strictly comparable.

TABLE 61

Monthly Average Wholesale Prices for Various Kinds of Fish, 1937
(yen per 10 kan)

	Tuna		Tai		Flounder		Bonito		Yellowtail	
	High	Low	High	Low	High	Low	High	Low	High	Low
January	65.20	42.30	125.40	102.80	48.00	32.70	20.40	16.40	31.50	27.20
February	21.50	14.60	145.00	121.00	56.20	45.40	14.10	12.50	17.20	15.50
March	31.37	24.27	137.50	104.00	55.03	38.36	14.53	11.30	13.64	12.69
April	32.43	21.33	102.48	74.76	41.04	28.23	13.30	10.11	12.32	11.81
May	30.13	18.46	66.46	31.16	32.50	22.78	12.39	7.29	12.10	10.43
June	10.56	6.62	47.55	38.29	30.13	22.68	9.95	4.87	8.78	8.10
July	20.95	12.17	63.26	50.76	41.26	34.96	10.22	5.79	8.98	8.54
August	-	-	76.16	59.60	38.00	28.16	14.79	7.44	11.86	11.03
September	30.00	-	116.63	83.45	54.66	44.91	13.58	7.07	16.00	15.00
October	10.25	-	99.54	70.39	48.39	35.72	10.94	7.89	15.66	16.00
November	42.00	38.00	89.44	69.52	42.36	31.06	15.70	13.60	17.00	16.00
December	48.78	32.79	128.58	97.51	46.93	28.45	15.66	12.25	31.53	27.32
Yearly Average	31.20	23.39	100.08	75.27	44.54	32.78	13.80	9.71	16.38	14.97

	Cuttlefish		Octopus		Renkotai		Prawn		Shrimp	
January	14.20	12.60	23.50	21.00	26.00	-	161.50	149.00	48.80	43.50
February	13.50	12.00	23.10	20.20	27.80	25.70	189.80	171.70	56.60	47.30
March	14.64	13.85	22.72	21.20	25.22	-	212.83	195.83	72.27	63.33
April	15.20	14.16	21.38	19.90	23.50	-	218.85	187.81	72.37	61.68
May	-	-	21.10	19.65	22.55	19.75	187.83	160.66	55.43	49.50
June	12.66	11.00	20.56	19.23	19.36	-	161.22	135.61	49.52	41.66
July	16.60	11.50	21.72	19.02	17.00	-	148.33	118.00	49.00	44.00
August	17.10	12.95	21.55	19.66	19.00	-	143.83	118.70	48.10	40.36
September	20.37	19.00	17.46	14.10	21.00[a]	22.00[a]	164.68	141.39	35.00	21.00
October	14.97	13.34	9.52	8.36	20.43	15.50	152.33	137.18	18.72	16.52
November	13.88	13.29	9.50	7.30	23.00	18.90	145.66	130.33	30.57	28.92
December	16.52	16.00	19.50	9.97	28.43	24.87	162.50	141.25	41.53	38.36
Yearly Average	15.42	13.61	18.55	16.63	22.77	21.12	170.78	148.95	48.16	41.35

Source: Nippon Suisan Nempo, 1938.

a/ As given in source.

prices of fish, that is the wholesale prices at the central markets, were published daily in the newspapers of the larger cities such as Tokyo, Yokohama, Osaka and Kyoto.

In August 1940 the prices of various foods came under government control and since that time the prices of many marine products have been controlled by the Ministry of Agriculture and Commerce through various of its wartime agencies (see pages 205 - 206).

Consumption. The importance of fish in the Japanese diet is far greater than in other countries for it is the major source of animal protein and also a leading source of fat. In the preponderantly starchy Japanese diet, which according to nutritionists has only "adequate" protein and is notably deficient in fat, fish is an essential item. Fish did not replace rice as the basis of a meal and was not normally consumed as a bulk food. 83/ The amount actually served at a meal seems trifling by Western standards, but because of its nutritional importance, fish is almost as indispensible as rice.

Per capita consumption of fish, shellfish, crustaceans and molluscs for food was probably about 65 pounds per year in terms of fresh fish. 84/

83/ This is even true in the coastal fishing villages.

84/ Prewar per capita consumption figures of fish in Japan vary greatly -- estimates from 40 to 160 pounds have been made with those between 50 and 110 pounds most common. These wide variations are understandable and not necessarily incompatible when one considers differences in meaning of "per capita consumption" and the difficulties of computing such a figure from the available statistics. In many cases the estimate does not make it clear whether the figure refers to the total per capita disappearance of all marine products (edible and inedible) in terms of the weight as captured, whether it refers to the consumption only for food, or whether it refers only to the weight of the edible portions of fish used directly as food. Since much of the Japanese catch was used for the

This may be compared with estimates of about 15 pounds for the United States, 25 pounds for Germany and 38 pounds for Great Britain. Whereas in many Western countries the per capita consumption of meat reaches more than a hundred pounds per year, in Japan it has been estimated at about four pounds. Thus fish takes the place of meat in the diet.

Wartime consumption has decreased greatly. On the basis of an estimated catch of 1,750,000 tons for last year and the assumption that almost all the fish caught was used as food, consumption for 1944-45 is estimated at about 40 pounds. This figure may be too high as part of this catch probably went into government stockpiles. Further reductions in production during more recent months may mean that average consumption has dropped still lower.

Japanese ideas concerning fish are radically different from those of Westerners who regard meat as of higher quality; Japanese in general prefer fish to meat regardless of price. Whereas Westerners know only a relatively small number of fish, the Japanese used more than 400 kinds of fish and shellfish for food purposes. Table 3 (page28) names the most important of these; locally many other kinds were in common use.

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production of fertilizer and oil and since there was also much waste in processing (or even in fish eaten fresh) the "per capita consumption" varied greatly in accordance with the concept used.

The following figures are presented here as estimates of the prewar (1936 - 1938) consumption:

	Per capita (pounds)
Total consumption (all uses) of fish, shellfish and crustaceans in terms of weight as captured	92 - 105
Consumption of fish, shellfish and crustaceans for direct food purposes in terms of weight as caught	60 - 70
Consumption of fish, shellfish and crustaceans in terms of edible portions	37 - 42

16-031 P180 bu

Fresh, salted, dried, smoked and canned fish were consumed. The largest amount was used fresh -- possibly 60 - 65 percent of that consumed as food. The chief forms of processed fish used domestically were dried and salted. Smoked fish was less commonly used and canned fish was consumed in relatively small quantities by the Japanese population. In recent years canned fish was on the increase among the wealthier people in urban centers, and during the war the canned fish which would normally have entered export channels has been used by the Army. In spite of this increased use of canned fish it cannot be emphasized too strongly that the bulk of the fish consumed by the Japanese population was fresh, salted or dried. Fish was eaten raw, boiled, broiled, fried or in soups and sauces.

Consumption of fish meal may be estimated at about 500,000 tons in prewar years and consumption of fish oils at about 75,000 - 1000,000 tons. 85/

Balance of Supply. Although marine products were produced throughout all parts of Japan proper, the regional output was not in accordance with the demand. Hokkaido and northeastern Honshu constituted a major surplus region whereas much of northwestern, central and southern Japan was deficient in fish. Within these latter areas, however, there were surplus producing districts some of which, Nagasaki for example, had large surpluses. Table 62 and Figure 9 show the surplus and deficit areas within Japan proper in 1939, based on the production of coastal fishing and deep-sea fishing in home waters. These fisheries together with aquiculture approximately provided the amount consumed within Japan proper during the prewar period.

85/ Although Japan imported large amounts of fish oils from Korea, exports of these products about equalled imports so that consumption approximated home production.

Figure 9.

PROVISIONAL EDITION

JAPAN

FISH PRODUCING AREAS, 1939

FOREIGN ECONOMIC ADMINISTRATION

PREFECTURES

KYUSHU

1. Kagoshima
2. Miyazaki
3. Kumamoto
4. Nagasaki
5. Saga
6. Fukuoka
7. Oita

SHIKOKU

8. Ehime
9. Kochi
10. Tokushima
11. Kagawa

HONSHU

12. Yamaguchi
13. Shimane
14. Hiroshima
15. Okayama
16. Tottori
17. Hyogo
18. Kyoto
19. Osaka
20. Wakayama
21. Nara
22. Mie
23. Shiga
24. Fukui
25. Ishakawa
26. Toyama
27. Gifu
28. Aichi
29. Shizuoka
30. Yamanashi
31. Nagano
32. Niiagata
33. Gumma
34. Saitama
35. Tokyo
36. Kanagawa
37. Chiba
38. Ibaraki
39. Tochigi
40. Fukushima
41. Yamagata
42. Migayi
43. Iwate
44. Akita
45. Aomori

HOKKAIDO

46. Hokkaido

ADMINISTRATIVE REGIONS

I Hokkai
II Tohoku
III Kanto
IV Tokai
V Kinki
VI Chugoku
VII Shikoku
VIII Kyushu

HOKKAIDO

HONSHU

SHIKOKU

KYUSHU

LEGEND

SURPLUS AREAS

- More than 50,000 ton surplus
- 15,000-50,000 ton surplus
- Less than 15,000 ton surplus

DEFI

- M… to…
- 15… to…
- Le… to…

Prefectural Bounda…

Regional Boundarie…

10 0 20 40 60 …
MILES

10 0 20 40 60 80 …
KILOMETERS

NO. 2582-M SEPTEMBER 25, 1945

G-4449 PREPARED IN THE MAPS AND

Figure 9.

UNRESTRICTED EDITION

JAPAN

FISH PRODUCING AREAS, 1939

FOREIGN ECONOMIC ADMINISTRATION

PREFECTURES

KYUSHU

1. Kagoshima
2. Miyazaki
3. Kumamoto
4. Nagasaki
5. Saga
6. Fukuoka
7. Oita

SHIKOKU

8. Ehime
9. Kochi
10. Tokushima
11. Kagawa

HONSHU

12. Yamaguchi
13. Shimane
14. Hiroshima
15. Okayama
16. Tottori
17. Hyogo
18. Kyoto
19. Osaka
20. Wakayama
21. Nara
22. Mie
23. Shiga
24. Fukui
25. Ishakawa
26. Toyama
27. Gifu
28. Aichi
29. Shizuoka
30. Yamanashi
31. Nagano
32. Niiagata
33. Gumma
34. Saitama
35. Tokyo
36. Kanagawa
37. Chiba
38. Ibaraki
39. Tochigi
40. Fukushima
41. Yamagata
42. Migayi
43. Iwate
44. Akita
45. Aomori

HOKKAIDO

46. Hokkaido

ADMINISTRATIVE REGIONS

I Hokkai
II Tohoku
III Kanto
IV Tokai
V Kinki
VI Chugoku
VII Shikoku
VIII Kyushu

HOKKAIDO
HONSHU
SHIKOKU
KYUSHU

LEGEND

SURPLUS AREAS

- More than 50,000 ton surplus
- 15,000-50,000 ton surplus
- Less than 15,000 ton surplus

DEFICIT AREAS

- More than 50,000 ton deficit
- 15,000-50,000 ton deficit
- Less than 15,000 ton deficit

Prefectural Boundaries
Regional Boundaries

10 0 20 40 60 80 100 MILES
10 0 20 40 60 80 100 KILOMETERS

130 132 134 136 138 140 142 144 146
44 42 40 38 36 34 32

SEPTEMBER 25, 1945

G-4449 PREPARED IN THE MAPS AND GRAPHICS DIVISION, F.E.A.

TABLE 62

Estimated Surpluses and Deficits of Fish by Regions, 1939
(1,000 metric tons)

	Total Production a/	Estimated Consumption b/	Estimated Surplus or Deficit + Surplus - Deficit
Hokkaido	994.9	96.8	+ 908.1
Tohoku			
Aomori	108.4	30.6	+ 77.8
Akita	10.3	32.1	- 21.8
Iwate	98.8	32.7	+ 66.1
Yamagata	6.8	34.2	- 27.4
Miyagi	73.8	38.7	+ 35.1
Fukushima	96.9	48.8	+ 48.1
Total Tohoku	395.0	217.1	+ 177.9
Kanto			
Niigata	26.0	61.0	- 35.0
Tochigi	.5	36.8	- 36.3
Ibaraki	69.1	47.6	+ 21.5
Chiba	181.2	47.8	+ 133.4
Gumma	.2	38.3	- 38.1
Saitama	.3	47.2	- 46.9
Tokyo	17.3	208.9	- 191.6
Kanagawa	24.2	59.3	- 35.1
Yamanashi	.1	19.7	- 19.6
Nagano	1.1	51.4	- 50.3
Total Kanto	320.0	618.0	- 298.0
Tokai			
Shizuoka	95.2	60.8	+ 34.4
Aichi	23.2	91.4	- 68.2
Mie	48.7	35.5	+ 13.2
Gifu	1.0	37.7	- 36.7
Toyama	38.8	24.3	+ 14.5
Ishikawe	57.3	23.3	+ 34.0
Total Tokai	264.2	273.0	- 8.8

16-C31 P183 b"

TABLE 62 (Continued)

Estimated Surpluses and Deficits of Fish by Regions, 1939

	Total Production a/	Estimated Consumption b/	Estimated Surplus or Deficit + Surplus - Deficit
Kinki			
Shiga	4.5	21.7	- 17.2
Fukui	23.1	19.9	+ 3.2
Kyoto	26.3	53.9	- 27.6
Nara	.2	19.1	- 18.9
Wakayama	22.7	26.5	- 3.8
Osaka	9.4	142.9	- 133.5
Hyogo	39.9	92.8	- 52.9
Total Kinki	126.1	376.8	- 250.7
Chugoku			
Tottori	9.7	14.7	- 5.0
Okayama	10.3	40.9	- 30.6
Shimane	37.5	22.6	+ 14.9
Hiroshima	16.7	56.2	- 39.5
Yamaguchi	101.9	36.7	+ 65.2
Total Chugoku	176.1	171.1	+ 5.0
Shikoku			
Kagawa	10.3	22.8	- 12.5
Tokushima	12.9	22.1	- 2.9
Ehime	59.8	35.4	+ 24.4
Kochi	40.0	21.4	+ 18.6
Total Shikoku	129.3	101.7	+ 27.6
Kyushu			
Nagasaki	215.2	40.1	+ 175.1
Saga	24.9	20.5	+ 4.4
Fukuoka	88.4	86.9	+ 1.5
Oita	20.5	30.1	- 9.6
Kumamoto	15.8	42.2	- 26.4
Miyazaki	27.7	25.9	+ 1.8
Kagoshima	65.3	48.4	+ 16.9
Total Kyushu	457.8	294.1	+ 163.7

16-031 P184 bu

TABLE 62 (Continued)

Estimated Surpluses and Deficits of Fish by Regions, 1939

	Total Production a/	Estimated Consumption b/	Estimated Surplus or Deficit + Surplus - Deficit
Okinawa	7.1	18.1	- 11.0
Total	2,870.6	2,166.7	+ 703.9
Aquiculture estimated production	119.0		
	2,989.6	2,166.7	+ 822.9 c/

a/ Production of coastal waters and deep-sea fisheries in home waters as given in Table 11.
b/ Population (1938 estimates) multiplied by 30 kilograms (66 pounds), estimated prewar per capita consumption. This assumes uniform consumption throughout Japan.
c/ This is approximately the amount which was used for fertilizer and fish oil.

Foreign Trade [86]

Exports. Despite Japan's high domestic consumption, fishery products also entered into its export trade. Certain fisheries, such as the Northern fisheries and Antarctic whaling, produced primarily for foreign markets, but the total amount of fishery products exported was only a small part of the total Japanese production -- probably about 10 percent by volume. Many of these export products, however, were of relatively high value compared to those consumed domestically and they provided Japan with desired foreign exchange. In the period 1935 - 1939 annual exports of fish and fishery products (food, oil, meal etc.) averaged more than 100 million yen and in 1939 was more than 175 million yen (Table 63). Although this was but 4 - 5 percent of the value of all exports, as a group, these commodities were second only to textiles (yarns and piece goods of cotton, silk, rayon and wool).

During the war period the exports of fishery products to Western countries largely stopped due to boycotts and the reduced production. The canned packs, smaller than in prewar years, have been used for the armed forces and for stockpiling. The trade with Asiatic areas, especially those under Japanese control, probably continued insofar as shipping has permitted.

86/ Appendix B contains statistical details of Japan's foreign trade in fishery products as recently compiled by the U. S. Tariff Commission. Much of the material in this section is based on its report "Japanese Trade Studies -- Special Industry Analysis No. 27 -- Marine Products," August 1945.

16-031 P186 bu

The great variety of fishery products exported in prewar years is indicated by Table 63. The exports may, however, be divided into two broad groups: (1) those which found markets in Western countries, particularly the United States, United Kingdom and other European countries; and (2) those generally taken by Oriental countries including countries in the Japanese sphere of influence. The first group consisted predominantly of canned fish and shellfish but also included frozen fish, fish meal fertilizer and fish and whale oil; the second group consisted largely of dried and salted products.

Canned Fish. Canned fish accounted for about half of the value of fishery exports, being valued at more than 65 million yen in 1938 and 1939. The relative importance of canned products exported was as follows: 87/

Product	Quantity Percent	Value Percent
Salmon and trout	50	54
Crab meat	9	21
Sardines	27	12
Tuna	4	6
Other	10	7
	100	100

Exports of canned salmon in 1938 amounted to 51,000 tons valued at 38 million yen (Appendix B). United Kingdom took 68 percent of the quantity and 79 percent of the value of these exports, with other European countries and Australia accounting for most of the remainder.

87/ "Japanese Trade Studies -- Special Industry Analysis No. 27 -- Marine Products," U. S. Tariff Commission, August 1945.

TABLE 63

Japanese Exports of Fishery Products by Value, 1938 and 1939 a/
(1,000 yen)

	1938	1939
Canned foods:		
Crabs	15,244	30,323
Salmon	28,383	27,092
Trout	10,079	8,907
Tuna	4,067	8,860
Sardine	7,543	7,922
Mackerel	680	872
Shellfish	1,842	2,732
Total canned foods	67,838	86,708
Dried fish and shellfish	7,648	23,916
Salted fish	3,331	13,150
Fresh fish and shellfish	6,672	9,624
Kombu (Laminaria)	2,638	7,342
Fish livers	-	6,047
Amanori (Porphyra)	791	1,389
Roasted fish	811	1,153
Agar-agar	6,201	8,144
Fertilizer:		
Fish powder	5,182	4,515
Sardine	4,506	4,188
Fish oil	4,348	5,277
Hardened fish oil	4,333	3,831
Shell	1,336	667
Total	115,635	175,251

Source: Japan Yearbook, 1940-41.

a/ These figures do not include exports to Korea, Formosa and other Empire areas. Canned fish and shellfish exported directly from the Northern fisheries and whale oil exported directly from Antarctic operations not reported in official statistics, are also omitted here.

During the five years ended in 1939 Japanese exports of canned crab averaged nearly 12,000 tons valued at slightly more than 20 million yen (Appendix B). These exports, which were more than 90 percent of the production, went largely to the United States (57 percent) and United Kingdom (28 percent).

Exports of canned sardines amounted to about 35,000 tons in 1937 but dropped to 23,000 - 26,000 tons in 1938 and 1939. Although Japanese sardines were shipped to practically all countries of the world Asiatic countries were the principal markets — the Philippine Islands, Netherlands Indies, the Straits Settlement and British India (Appendix B).

Annual exports of tuna from Japan for the five-year period ended 1938 averaged more than 5,000 tons valued at more than 5 million yen. The United States was the leading market taking about two-thirds of the total.

Salted Fish. Total exports of salt fish were valued at about 2.6 million yen in 1936, or about 10 percent of production. These consisted of salmon, trout and cod shipped to Asiatic countries.

Dried Fish. The more important exports of this group were dried cod, dried shellfish and dried seacucumbers. Asiatic markets predominated (Appendix B).

Seaweeds. Exports of seaweeds were largely vegetable isinglass (agar-agar), tangles and dried laver (Appendix B). In 1938 these exports were valued at 9.6 million yen with vegetable isinglass accounting for 65 percent of the total. The United States, France, Germany and the United Kingdom took most of the vegetable isinglass which was

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produced primarily for export. Only a small percent of the tangles and laver entered into foreign trade; China. Kwantung and Manchuria (Manchukuo) were the chief markets for these products.

Fish Meal. In recent prewar years Japan produced from 50,000 - 100,000 metric tons annually for export markets. More than half of the exports were shipped to the United States with European countries (principally the Netherlands, the United Kingdom and Germany) the next most important markets (Appendix B).

Fish and Whale Oil. Exports of fish oils (including hardened fish oil) amounted to about 60,000 to 100,000 tons in 1937 and 1938 (Appendix B). In addition most of Antarctic whale oil production was sent abroad, in 1938-39 about 70,000 tons of the 80,600 tons produced being exported.

Fresh and Frozen Fish. These exports represented a minor part of the total trade in marine products. The United States took about half of the quantity and slightly more than half of the value of these exports. Seed oysters, live goldfish, frozen fish livers, frozen tuna and swordfish were the products exported to the United States. Nearby China and Kwantung were the other important markets for fresh and frozen fish (See Appendix B).

Imports. Japanese imports of fish and fishery products were relatively small compared to the total production of fisheries based on Japan proper, and were also considerably less than the exports of

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these products. 88/ In 1938 imports were valued at 52 million yen whereas exports were more than 125 million yen. .Largest imports were from colonial areas, chiefly Korea; foreign countries provided only a negligible quantity.

During the five years ended 1940 exports of fishery products from Korea to Japan proper averaged about 240,000 metric tons (Table 12 Appendix B). Only about 25 percent of this, however, was fish and shellfish for food purposes; most of the remainder was refuse material for meal and oil manufacture and the processed meal and oil. Statistical data are not available for the imports of fishery products into Japan proper from Karafuto, Formosa and the Japanese Pacific islands although these colonial areas are known to export to the home country. The Karafuto production of canned fish was largely exported to non-Japanese areas, but part of Karafuto's surplus dried and salted fish was probably consumed in Japan proper. Some of the Pacific islands produced surpluses of dried bonito and tuna, part of which was consumed within Japan.

About half of the imports from foreign areas were non-edible products -- mollusc shells, tortoise shells, sponges and fish guano (Appendix B). Of the imports from foreign countries for food purposes the Soviet Union was the chief provider.

During much of the war period colonial imports may have remained fairly high although the small importsfrom foreign countries practically ceased. In recent months, however, imports from colonial areas also declined greatly.

88/ Because of the type of statistical data available it is impossible to make a satisfactory estimate of the volume of imports vs. exports, but a consideration of the production and trade statistics indicates a sizable surplus of exports by volume and a domestic consumption in the neighborhood of three million tons of fish, shellfish, crustaceans and molluscs (in terms of fresh product), the consumption figure used throughout this report.

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V. ADMINISTRATION AND ORGANIZATION OF THE INDUSTRY

Government Administrative Organization

Central Government. The central governmental administration of the Japanese fishing industry in prewar years was through the Fisheries Bureau (Suisan Kyoku), one of the six bureaus of the Ministry of Forestry and Agriculture (Norinsho). 89/ This bureau exercised control over all aspects of the industry although much of the administrative and supervisory work was delegated to prefectural governments and various associations. It licensed and directly administered certain fisheries (see page 168); carried out the regulation of international treaties; supervised and aided the various societies and associations, carried on research; provided for the protection and propagation of fish; and published the national fisheries statistics.

In 1938 the bureau contained five sections, two of which were the Fisheries Administration Section and the Fishing Boat Insurance Section. One source names two of the other sections as the Fisheries Superintendence Section and the Aquiculture Section whereas another source reports the remaining three sections to have been the Ocean (High Seas) Fishing Section, the Marine Products Section and the Control Section. The Imperial Fisheries Institute, a government school, is really a part of the Fisheries Bureau.

89/ In late 1943 in a wartime government reorganization parts of two Ministries -- Agriculture and Forestry and Commerce and Industry -- were consolidated to form a new Ministry of Agriculture and Commerce (Noshosho). The Fisheries Bureau is thought to have been transferred intact to this new ministry.

Prefectural Government. Much of the actual regulation of the fisheries was handled by the prefectural governments. Through authority given them by the central government they promulgated and enforced laws relating to fishing and regulated the various societies concerned with the industry. They licensed fisheries under their jurisdiction (see page168) and also engaged in research, conservation measures and educational work.

These activities were handled under the "economic sections" of the prefectural governments. In 1939, 23 of the coastal prefectures where fishing was a major industry had separate fisheries divisions within the economic sections; the other prefectures had no separate fisheries division, but all had officials who were concerned with the industry.

Governmental Activities 90/

Licensing. All Japanese fishing was licensed — some types by the central government and others by the prefectural governments. By the Fishery Law of 1901 "licensed fishing" was established according to four categories: (1) "exclusive right" fishing; (2) "fixed place" fishing; (3) "limited sphere" fishing; and (4) "special" fishing. The first type of license, that of "exclusive right," provided the right to fish within given areas to the exclusion of all others by methods not included in the other three classes. These licenses were granted only to fishermen's societies (Section 4 of the Fishery Law, Appendix C) which settled among

90/ See Appendix C for laws and regulations relating to fisheries.

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their members the rights grantable to individual fishermen. Fishing in "fixed places" included operations by fish traps, pound nets and weirs; fishing in "limited sphere" denoted areas in which marine products such as oysters and seaweed are grown; "special fisheries" included whaling and other fishing for which special licenses were issued. Fishing of these various categories were greatly intermingled; these rights often contiguous, commingled or even conflicting are reported to have been mapped and registered by the prefectural governments. Table 64 gives the number of licenses of each type by districts for 1937.

"Exclusive right" fishing was licensed by the prefectural governments. "Special"licenses, which in 1939 included those for whaling, trawling, sealing and floating cannery operations, were issued by the central government. The other two categories are thought to have been licensed by the prefectural governments although no direct statement to this effect was found; at least prefectural governments are reported to have records and maps indicating the location of all such fisheries.

Taxation. Taxes were prefectural and differed from district to district. They were levied as a license fee for the particular classes of fishing, as rental for particular areas or as direct taxes on boats, nets, persons or "fishing households."

Conservation Measures. Both the central government and prefecural governments issued orders and regulations designed as conservation measures. Those issued by the central government dealt with whaling, sealing, trawling and crab fishing whereas those issued by the prefectural

TABLE 64

Number of Fishing Licenses by Districts at End of March, 1937

Prefecture of Fu	Total Number of Licenses	"Exclusive Right" Licenses a/				Fixed Place Licenses	Limited Sphere Licenses	Special Fisheries Licenses
		Waterfront type	Customary Practice type	Unclassified	Total			
Hokkaido	9,510	172	-	-	172	8,854	37	15,319
Aomori	1,114	84	45	-	129	959	11	15
Iwate	720	38	38	-	76	406	172	66
Miyagi	1,378	79	30	-	109	588	660	21
Akita	943	45	34	-	79	519	199	146
Yamagata	438	32	7	-	39	206	71	122
Kanagawa	323	36	1	-	37	141	79	66
Ibaraki	645	42	8	-	50	449	56	90
Tochigi	51	4	-	-	4	-	47	-
Gumma	67	7	4	-	11	36	20	-
Saitama	79	3	-	-	3	5	71	-
Chiba	657	86	76	6	168	199	260	30
Tokyo	268	49	15	-	64	13	179	12
Fukui Kawa	467	68	19	-	87	131	147	102
Niigata	1,028	140	90	2	232	499	12	285
Toyama	747	20	75	-	95	375	15	262
Ishikawa	1,677	76	66	-	142	1,428	34	73
Fukui	858	47	72	-	119	558	15	166
Yamanashi	32	2	1	-	3	25	4	-
Nagano	42	11	-	-	11	25	6	-
Gifu	102	4	-	-	4	89	6	3
Shizuoka	952	145	75	-	220	213	131	388
Aichi	955	104	41	-	145	455	229	126
Mie	1,431	33	219	-	252	292	223	664
Shiga	718	-	1	-	1	531	55	131
Kyoto	730	40	23	-	63	386	6	275
Osaka	71	25	11	2	38	23	3	7
Hyogo	1,341	42	108	-	150	675	185	331
Nara	11	1	-	-	1	10	-	-
Wakayama	1,307	92	48	1	141	373	239	554
Tottori	133	35	9	-	44	67	10	12
Shimane	887	68	108	-	176	224	57	430
Okayama	1,473	38	40	-	78	1,008	187	200
Hiroshima	4,559	111	48	2	161	839	2,484	1,075
Yamaguchi	3,094	84	114	-	198	974	115	1,807
Tokushima	510	27	46	-	73	272	25	140
Kagawa	2,244	46	85	1	132	1,126	519	467
Ehime	4,632	109	287	3	399	915	93	3,225
Kochi	786	79	60	-	139	263	48	336
Fukuoka	1,114	22	73	-	95	635	234	150
Saga	898	34	1	-	35	231	460	172
Nagasaki	2,756	250	179	-	429	1,168	123	1,036
Kumamoto	1,100	86	26	-	112	307	173	508
Oita	1,946	76	53	-	129	873	62	882
Miyazaki	509	10	19	-	29	312	45	123
Kagoshima	866	92	17	1	110	362	21	373
Okinawa	102	44	6	-	50	45	6	1
Total	56,271	1,738	2,278	18	5,034	28,084	7,834	15,319

Source: Nippon Suisan Nempo, 1938.

a/ Granted only to fishermen's societies (gyogyo kumiai).

governments dealt with local coastal depletion. These included strict licensing, restrictions on use of some gear. Propagation of fish and the stocking of rivers and lakes was carried out in some prefectures by the government. Hatcheries, both government-owned and private, were regulated.

Aid to Societies and Associations. Societies and their federations were encouraged and aided by the government at both levels. Subsidies have been given to certain activities carried out by these organizations. The associations were likewise encouraged and aided.

Research Activities. Both the central government and the prefectural governments were active in fishery research. The central research body was the Fisheries Experimental Station at Tokyo. There were 87 well-equipped fisheries experiment stations in the Empire, including the colonies. Research in oceanography was promoted by the large number of vessels operated out of government research stations. Training and research were combined on many such vessels.

Bounties, Subsidies and Other Governmental Aid. Table 65 summarizes the expenditures of the central government for aid to the fishery industry for 1932-33 to 1934-35, the latest years for which such data are available. Assistance may be divided into direct bounties and subsidies and indirect assistance.

Direct aid has included money granted for deep-sea fisheries, repair of vessels, cold storage facilities, manufacturing and various cooperative undertakings. Assistance of this type was usually extended

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TABLE 65

Japanese Governmental Expenditure for Fisheries, 1932-33 to 1934-35
(1,000 yen)

	1932-33	1933-34	1934-35
Bounties and Subsidies:			
Direct assistance:			
Pelagic fisheries	233	232	232
Repair of vessels	120	20	35
Cold-storage facilities	650	233	138
Cooperative activities	233	225	225
Other	364	258	221
Total	1,600	968	851
Indirect assistance:			
Home market promotion	15	12	12
Promotion of exports	11	68	67
Regional assistance	227	86	93
Total	253	166	172
Total bounties and subsidies	1,853	1,134	1,023
Other Government Aid:			
Facilitation services:			
Research	800	1,081	772
Fish propagation and conservation	374	378	434
Port facilities	5,662	11,353	4,361
Other	36	70	76
Total	6,873	12,882	5,643
Administrative expenditures:	573	612	451
Total other government aid	7,446	13,494	6,094
GRAND TOTAL	9,300	14,628	7,117

Source: Report to the United States Senate on Subsidies and Bounties to Fishery Enterprises by Foreign Governments, Report No. 116, Second Series, U. S. Tariff Commission, 1936 (Section on Japan).

to various societies and associations rather than to individual fishermen.,

Indirect assistance was given by promoting marketing at home or abroad, granting appropriations to prefectural governments for regional use, and expenditures for research, fish propagation and port facilities.

Societies and Cooperatives

The Japanese fishermen and others interested in the industry were organized into three types of societies: 91/ fishery societies (suisan-kai), aquatic products societies (suisan-kumiai), and fishermen's societies (gyogyo-kumiai). All three types had official status and were set up pursuant to special laws. The government, both central and prefectural, assisted and regulated their activities. Societies of each type were also coordinated into federations or into prefectural and national societies.

Fishery Societies (Suisan-kai). These were organizations which were formed according to the provisions of the Suisan-kai Law of 1921, consisting in immediate prewar years of about 300 local societies covering city or county units and 40 prefectural societies organized by the city and county societies (Table 66). These local societies were coordinated and controlled by the Imperial Fishery Society (Teikoku Suisan-kai). 92/

91/ In many sources these organizations are referred to as "associations", "guilds" etc. The English names as given here with the Japanese names are used throughout this report.

92/ In some sources called the National Association of Fisheries.

TABLE 66

Societies Concerned with the Fishing Industry: Number, Members and Expenditures, 1928, 1930 and 1934-37

	1928	1930	1934	1935	1936	1937
Fishery Societies (Suisan-kai)						
Number of Societies:						
Total	371	377	346	344	344	343
County and City Societies	331	337	305	303	303	302
Prefectural Societies	39	39	40	40	40	40
Imperial Fishery Society (Teikoku Suisan-kai)	1	1	1	1	1	1
Number of Members:						
County and City Societies	440,511	457,298	450,696	444,135	447,496	448,452
Prefectural Societies	330	334	296	294	299	296
Imperial Fishery Society	42	42	42	43	43	43
Expenditure of Societies (yen)	2,027,451	1,899,844	1,644,675	1,545,577	1,672,326	2,063,959
Aquatic Products Societies (Suisan-kumiai) a/						
Number of Societies and Federations:	47	48	68	67		
Societies and Federation under Fishery Law	46	47	67	66		
Societies	45	46	66	65		
Federations	1	1	1	1		
Societies and Federation under law relating to societies in foreign waters b/	1	1	1	1		
Number of Members:						
Societies under Fishery Law	52,441	51,241	42,513	45,937		
Federations under Fishery Law	3	3	3	3		
Societies under law relating to societies in foreign waters	39	130	37	27		
Expenditure of Societies and Federations (yen)	803,796	776,634	1,051,541	1,303,201		
Fishermen's Societies (Gyogyo-kumiai)						
Number of Societies classified by number of members						
Total	3,870	3,874	3,994	4,000	3,998	4,016 c/
Less than 50	1,287	1,239	1,257	1,223	1,198	
51 - 100	938	913	923	933	928	
101 - 200	919	957	973	1,694	1,719	
201 - 500	619	649	692			
501 - 1,000	93	100	124	124	123	
More than 1,000	14	16	25	26	30	
Number of Members of Societies	509,863	526,579	574,328	580,103	594,710	605,010
Federations of Societies						
Number of Federations	48	61	72	74	80	89
Number of Member Societies	636	830	926	941	975	1,596

Source: Statistical Abstract of the Ministry of Forestry and Agriculture, 1936-37 and Japan Yearbook, 1940-41.

a/ Data not available for 1936 and 1937.
b/ The one society in this category is the Aquatic Products Society of Russian Waters (Roryo Suisan-kumiai).
c/ Breakdown is not available.

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Members of these fishery societies included not only persons engaged in fishing but those who manufactured, traded in or stored fishery products. The functions are said to have included "encouragement of fisheries, improvement and extension of the manufacture of marine products, development of fishing districts and protection of aquiculture." They also looked after the rescue of shipwrecked vessels, worked in the field of labor relations and engaged in educational work through lectures and exhibitions. These societies have been used by the central government to finance and improve fishery methods and to collect statistics.

Aquatic Products Societies (Suisan-kumiai). 93/ These were organizations of fishermen and persons engaged in the manufacture or sale of aquatic products, formed under the Fishery Law of 1901, for the purpose of "improving the fisheries, cultivation of aquatic products etc." Unlike the fishermen's societies formed under the same law, they were not permitted to engage in actual fishing but were trade associations intended to work for the general improvement of all branches of the fishery industry, using "fishery" in its broadest sense. Although fishermen belonged to these societies proprietors who owned vessels and gear and those engaged in marketing or other phases seemed to have dominated many of the societies. Except for matters provided for in the Fishery Law and Rules, these organizations were regulated by the law of 1900 relating to Associations for Staple Products (Jugo-bussan Dogyo-kumiai).

93/ Some sources refer to these organizations as fishery or aquatic products "guilds."

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In addition to the societies of this type dealing with fisheries in home waters an act in 1902 provided for the establishment of suisan-kumiai in foreign waters. There was but one organization under this law -- Aquatic Products Society of Russian Waters (Roryo Suisan-kumiai) which in 1935 was composed of 27 member bodies.

Most sources make no clear distinction between the type of functions or the requisite membership of the suisan-kai and suisan-kumiai. One source refers to the latter as "labor organizations" and states that members appear to be largely drawn from industrial fishermen employed by large companies, but another source refers to them as "trade guilds." The actual range of activities of both types of organizations appears to have been very wide and undoubtedly overlapped. Duplication of activities is suggested by the fact that suisan-kumiai declined as suisan-kai were formed following the law authorizing them in 1921. 94/

Fishermen's Societies (Gyogyo-kumiai). These societies which were the chief organizations of the village fishermen numbered more than 4,000 with a membership of more than 605,000 in 1937. These local societies were coordinated into federations (gyogyo kumiai rengokai) of which there were 89 in 1937 (Table 66).

The fishermen's societies have origins which can be traced back to remote times, but were legally established by the Fishery Law of 1901 for the purpose of acquiring fishery rights for member fishermen. Licenses for "exclusive right" fishing by law could only be granted to

94/ In 1920 there were more than 220 aquatic products societies (suisan-kumiai) but in 1935 only 65 (Table 66).

these societies which in turn delegated privileges to their members. Membership in these societies was voluntary but in the small coastal fishing villages almost all adult persons were members of these societies. Prefectural governments regulated and supervised these societies.

Although the original object was the acquisition of fishing rights, gradually some of these organizations took on other functions concerned with the improvement of economic conditions of the fishermen. By 1920 several hundred organizations growing out of gyogyo-kumiai had taken on cooperative aspects engaging in cooperative marketing, purchasing and credit arrangements.

Cooperatives. 95/ The cooperative movement in Japan has permeated the fishing industry, particularly the coastal fishing carried on in numerous small villages. As indicated above the fishery cooperatives grew out of the gyogyo-kumiai. Some sources consider all gyogyo-kumiai as cooperatives, but others indicate a much smaller number -- 723 in 1936. This latter figure probably comes nearer to the number of true cooperatives (sangyo-kumiai) dealing with fishing activities.

It is frequently stated that the fishery cooperatives began in 1933 with the revision of the Fishery Law. Actually they began earlier but this law, which was favorable to the cooperative activities of village fishermen's societies in marketing, purchasing and credit arrangements, caused the reorganization of many of these societies to include cooperative enterprises.

95/ For information concerning cooperatives in agriculture in which conditions are somewhat similar to those of the fishing industry, see "Civil Affairs Guide -- Agricultural Associations of Japan" (Preliminary), February 1945.

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Fishery cooperatives, like other cooperatives, were organized in accordance with the Cooperative Societies Law of 1900 and its numerous amendments. Originally they were organized on a voluntary basis and individuals might belong or not as they chose. Cooperatives related to the fishing industry like those related to other industries were grouped into four kinds, engaged in credit, sales, purchasing and "utility." A single society, however, could and in many cases did carry out one, two, three or all four of the functions. Credit functions were the providing of credit to fishermen; sales functions the cooperative marketing of the products produced by members; purchasing groups bought such articles as fishing implements needed by their members; and "utility" groups allowed members to make use of such facilities as boats and equipment.

Above the local level were cooperative federations organized on district, prefectural or national lines and engaged in the same type of work as the local cooperatives. At the national level was the Central Union of Cooperative Societies (Sangyo-kumiai Chukai) under the supervision of the Ministry of Agriculture and Forestry and also a Central Bank for Cooperative Societies (Sangyo-kumiai Chuo Kinko). 96/

Although the cooperatives related to the fishery industry were sponsored and encouraged by the government, being offshoots of the gyogyo-kumiai and related to cooperative activities in other industries, they appear to have been, at least originally, indigenous and voluntary.

96/ This applies not only to the cooperatives of the fishery industry but to all cooperatives.

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Companies

According to Japanese statistics fishery companies in the period 1936 - 1941 numbered more than 300, capitalized at between 182 - 298 million yen (Table 67). There is little information about most of these companies, some of which engaged in deep-sea fishing off Japan proper and in aquiculture. The largest companies were those active in the deep-sea operations of trawling and motor-boat dragging, whaling and fishing in Northern and colonial waters. Most of these latter operations were undertaken on a huge scale under a monopolistic system with investment of large capital. Numerous companies which had previously engaged in these fisheries were merged, with government encouragement, to form super-corporations, the ultimate management of which, in most cases, integrated fishing activities with such diverse interests as ship-building and the manufacture of fertilizer, explosives and soap. The two largest companies, which together dominated the operations in Northern waters, whaling and trawling were the Japan Marine Products Company (Nippon Suisan K. K.) and the Nichiro Fishery Company (Nichiro Gyogyo Kaisha). Another large company operating in 1940 was the Hayashikane and Company. In the distributing of marine products Mitsubishi Shoji Kaisha dominated. Fourteen of the large companies, some of which operated outside Japanese waters, are listed in Appendix D .

As indicated below the largest companies were most strongly interested in the export production. These firms were at least partially controlled by the large Japanese industrial combines. One can distinguish

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among others the well-known family firms of Mitsubishi and Mitsui and the Nissan interests (the Manchurian Heavy Industry Development Corporation).

TABLE 67

Japanese Fishing Companies, 1936 - 1941

	Number of Companies	Capital (yen)	Reserves (yen)	Net Profit (yen)
1936	346	182,241,152	16,665,136	15,491,053
1937	353	253,677,652	24,033,043	16,077,870
1938	313	263,093,982	27,901,291	21,173,009
1939	312	259,200,000	29,500,000	24,900,000
1940	331	273,404,454	52,021,674	37,304,332
1941	318	298,194,000	64,223,000	51,542,000

Source: Japan Yearbook, 1943-44.

Japan Marine Products Company (Nippon Suisan K. K.). This company, the largest of all Japanese fishery companies, was created in 1937 under sponsorship of the Imperial Government. It was successor to the much older Kyodo Gyogyo K. K. which had started in the trawling business in 1914, capitalized at 2 million yen. After a series of consolidations with other companies, the Nippon Suisan K. K. in 1939 was operating steam trawlers, floating crab canneries and factory whalers as well as smaller types of vessels.

Its operations in recent years stretched from the Northern waters to the Antarctic whaling grounds with vessels also operating in the Pacific south of Japan, in the Indian Ocean and even off Central America and Argentina. In 1939, when it was capitalized at 92 million yen, with the Manchurian Heavy Industry Development Corporation as its chief shareholder, it claimed 87 percent of the Japanese trawlers, 70 percent of

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the motorized drag-netters, 99 percent of the crab pack produced on floating canneries, 40 percent of the whaling with floating factories and 76 percent of the near-sea whaling, 50 percent of the ice output of Japan, 61 percent of the refrigerating capacity and 20 percent of the total Japanese exports of marine products.

At Tobata the company had a modern fishing base with wireless transmitting station for communicating with its scattered fleet. Its main office was in Tokyo, but its 50 branches were scattered throughout Japan, Korea, Formosa and China.

Nichiro Fishery Company (Nichiro Gyogyo K. K.). This company was the other large fishery combine, said to have been controlled by the Mitsubishi interests but also having among its shareholders the Mitsui Bussan. Capitalized at 54 million yen in 1940 this company controlled the operations in Soviet waters, the northern Kuriles and the floating salmon canneries. Three of its main subsidiaries were the Hokkai Canning and Warehousing Company which manufactured cans and handled warehousing, the Pacific Fishery Company which worked floating salmon canneries and the Kuriles Aquatic Company which carried on fishing in the northern Kuriles. Salmon was the mainstay of this company although it also produced crab, cod and other species of the northern area. In 1939 it operated 34 canning plants and 55 refrigerators in this area in addition to several large-scale refrigerators located in Hokkaido, northern Honshu and in Tokyo.

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The company had its head office in Tokyo but the operating headquarters for Nichiro and its affiliates was at Hakodate. Outfitting and ship repair were carried on at this Hokkaido port.

Hayashikane and Company (Hayashikane Shoten K. K.) This was a family company which had operated in fisheries for more than 100 years, but was reorganized into a large joint stock company, capitalized at 15 million yen in 1924. In 1939 it and its subsidiary corporations owned 580 fishing boats with a tonnage of 70,000 gross tons and engaged in distribution of marine products and fishing gear and equipment.

The chief subsidiary was the Taikyo Whaling Company which operated in the Antarctic. The head office of Hayashikane was located in Shimonoseki with main branches at Tokyo, Aomori and Nagasaki.

Mitsubishi Trading Company (Mitsubishi Shoji Kaisha) was the dominant firm in the distribution of marine products. In 1938 it handled the marketing of 70 percent of the canned salmon and 65 percent of the canned crab; it was the exclusive distributor of Nichiro salmon and crab and Nippon Suisan crab. In addition, it handled canned tuna, sardine and mackerel, fertilizer and fish oils (including whale oil).

Associations

Fishing, processing and marketing groups, whether companies or societies were coordinated in one or more of various nationwide associations. Many of these associations were government sponsored and through them the government exercised control.

Three of the nationwide associations were the Imperial Fishery Society (Teikoku Suisan-kai), the Fisheries Society of Japan (Dai Nippon

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Suisan-kai) and the Central Association of Fisheries Cooperatives. The first was a national association which tied together the numerous local and prefectural fishery societies (suisan-kai). The Dai Nippon Suisan-kai, which originated in 1882, had members drawn from among scholars, statesmen, industrialists and businessmen and published a number of volumes dealing with the industry. The Central Association of Fisheries Cooperative Societies, formed in 1933, coordinated the local fishery cooperatives.

In addition to these, associations of manufacturers and exporters of various marine products were organized into a number of special trade associations. These as of 1939 are listed below. Their functions dealt chiefly with inspection of products for export, control of production, the conducting of surveys on markets, and research on the improvement of processing and export marketing. They were government sponsored and all packers of some products were forced to belong to the association dealing with those products.

Japanese Salmon Canners Association
Japanese Canned Crab Packers and Exporters Association
Sardine and Pilchard Canners Association
Tuna Packers Association of Japan
Shellfish Packers Association of Japan
Cod Fish Packers Association of Japan
Fish Meal Producers and Exporters Association
Agar-agar Exporters Association of Japan
Frozen Tuna Association
Frozen Scallops Producers Association

Other associations of nationwide membership which were concerned with some phase of the fishery industry were:

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Canned Food Association of Japan which coordinated the various canned product associations, many of which are listed above.
Society of Ocean Fisheries Promotion .
Fishing Vessel Owners Association
Japanese Association of Refrigeration
Aquatic Products Dealers Association

Trade associations (dogyo-kumiai) which were apparently not nationwide in scope included:

Tokyo Canned Foods Association
Osaka Canned Foods Association
Dried and Canned Marine Food Exporters Association of Yokohama
The Land and Marine Products Exporters Association of Kobe
Marine Products Association of Nagasakk Prefecture
Marine Products Exporters Association of Kammon
Marine Products Dealers Association of Hakodate
Marine Products Dealers Association of Otaru
Hokkaido Tangle Exporters Association

Some of these inspected marine products packed by producers not affiliated with the nationwide canned food associations. Most of them engaged in promotional activities.

Fishery Schools and Training

The outstanding institute for training in fisheries was the Imperial Institute of Fishery, a government institute near Tokyo. This institute provided training in all aspects of the industry including fishing methods, operation of vessels, fish culture, processing and the development of marine resources -- a more extensive program than fishery schools offer in most countries. Many of the graduates of this institute were engaged in professional fisheries research, in the management of the industry or in governmental administration of fisheries.

Other institutes of the higher grade for fishery education and training were the Hakodate Higher School of Fishery and the Fishery

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Section at the Agricultural College of Tokyo Imperial University. Fisheries teachers colleges were located at Toyama and Nagasaki and fisheries training was also available at 27 institutions of middle school grade. All the marine prefectures emphasized fisheries training for boys from fishing villages.

Fisheries education in Japan was supported to an extent unknown in other countries. The range of subjects offered in the schools was more extensive and the fishery schools and training institutes were equipped with training vessels, experimental stations, fish hatcheries and plants for processing marine products.

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