

JAPANESE DISTANT-WATER FISHERIES: A REVIEW¹

HIROSHI KASAHARA²

ABSTRACT

Most of the industrialized fisheries of Japan have developed under a licensing system controlled by the central government. Limitations on entry and the allocation of resources based on a variety of social and economic considerations have resulted in the development of an extremely diversified industry.

The postwar expansion of distant-water fisheries greatly accelerated the exploitation of resources in the North Pacific, as well as in many other areas of the world, and has caused numerous international conflicts. In addition to regional conventions for high seas fisheries, various bilateral agreements have been negotiated to cope with problems arising from jurisdictional claims by coastal states. While supporting narrow limits of national jurisdiction and the concept of free access to high seas fishing, Japan has accepted different forms of allocation as a means to accommodate the conflicting interests of the nations involved. Her domestic institutions and organization of the industry have helped the government make pragmatic arrangements with other nations. Whether or not a general agreement on fishery issues can be reached at the new Law of the Sea Conference, Japan will face more and harder international negotiations in view of the general trend of coastal states claiming broader zones of national jurisdiction.

Each of the main sectors of the Japanese fishing industry, including inshore fisheries, offshore fisheries, distant-water fisheries, and aquaculture, now operates under severe constraints. Although the total catch of distant-water fisheries is still increasing due largely to intensified pollack fishing in the Pacific, long-term prospects for further expansion do not appear bright. Little progress has been made in the utilization of abundant resources of unconventional species. Thus, the rapid growth of domestic fishery production is unlikely to continue. Increased joint ventures and other business arrangements in foreign countries may provide a partial solution. Import decontrol for fishery products would contribute substantially to meeting immediate problems of supply shortage.

This paper was originally drafted to provide, as part of the NORFISH study under the Washington Sea Grant Program which is supported by the National Oceanic and Atmospheric Administration, some background information on the development and the present status of the Japanese high seas fisheries, particularly those which have bearing on various international arrangements in the North Pacific. Since, however, discussions on the future regimes of the sea have been carried out with increasing intensity, the emphasis of the paper has shifted somewhat from descriptive information to a more analytical study of the international fishery

problems faced by the Japanese government and industry, as well as the courses of action they are likely to take in response to future changes in international regulatory regimes. The importance of the topic in considering future international arrangements for fisheries is obvious, for the Japanese and Soviet distant-water fisheries have been among the major sources of international conflicts over fishery matters in various parts of the world. Although emphasis is on the North Pacific, developments in the rest of the world are also covered to the extent that they have bearing upon the situation in the North Pacific.

The present paper is not a comprehensive study of the Japanese fishing industry to examine closely all sectors of the industry, including inshore, coastal, and distant-water fisheries, as well as processing and marketing

¹ Contribution No. 360, College of Fisheries, University of Washington.

² College of Fisheries, University of Washington, Seattle, WA 98195.

aspects. It emphasizes those fisheries the development of which have had substantial effects on international regulation of fisheries, except for such passing references to other elements of the industry as considered relevant.³

One of the serious problems about writing an English paper concerning Japanese fisheries is that fishery institutions in Japan are extremely complex and difficult to understand. It is almost impossible for foreigners to fully comprehend institutional aspects of the Japanese fishing industry without having been in the country for some time. English literature in this area is meager. Yet, domestic institutions for fisheries have had such tremendous effects on development of all Japanese fisheries, including those in distant waters, that it is often irrelevant to discuss their problems without having some understanding of the institutional framework in which they operate. To obtain some general information on this aspect, the readers of this paper are referred to four English papers: Oka, Watanabe, and Hasegawa (1962), Kasahara (1964), Comitini (1967), and Herrington (1971).

All high seas fisheries discussed in this paper are rigidly regulated by what is called "the licensing system." The system controls the activities of each fishery through restrictions on the total number of licenses to be issued, size of vessels to be used, area of fishing, method of fishing, and often species to be taken. Although the actual regulations under this system differ from fishery to fishery, a common, and most important, feature is direct control on the number and types of vessels to be used for a particular fishery. The justifications used by the government for imposing the limited entry system on offshore fisheries has varied. Among apparent objectives

are: protection of inshore fisheries against offshore fishing, reduction of competition and prevention of disputes between different groups of offshore fishermen, stabilization of fishing conditions, maintenance of profitability, conservation of resources, prevention of international disputes, and others. Degree of success in achieving these objectives has also differed from case to case, but there is no question that the system has served as a powerful and convenient means to control each fishery and introduce such changes as considered desirable by the Japanese fishery administration.⁴

Practically all offshore and distant-water fisheries discussed in this paper are regulated by the central government. While legal authority is vested in the Minister of Agriculture and Forestry, the Fishery Agency (Suisancho), which is subordinate to the Ministry of Agriculture and Forestry, has in fact full power to control all major fisheries. There still exist a large number of small fisheries regulated by the provincial authorities, but they have practically no international implications, except those operating off the southernmost part of the Kurile chain and in Korean Straits. Chapter 3 of the Fishery Law, as amended in 1963, provides that anyone wishing to be engaged in any of so-called "designated fisheries" must be licensed by the Minister of Agriculture and Forestry, and spells out principles under which such licenses are issued. Administrative ordinances specify the designated fisheries and the types of regulation under which they operate. This category includes practically all important fisheries carried out in waters far from the home islands, as well as the coastal trawl fisheries conducted by medium vessels and purse-seine fisheries by medium and

³ The author excluded whaling from the present paper due to lack of time. The history of the whaling industry is a story of its own, and may better be dealt with as a separate topic. Two nations, Japan and the Soviet Union, are more responsible than others for the present state of baleen whale stocks. Their recovery in the Antarctic would take many years even with restrictions more severe than those currently enforced. The relative importance of whaling in the Japanese fishing industry has decreased rapidly in recent years. While the omission of the topic affects the comprehensiveness of first two sections, its inclusion would not change greatly the substance of the last section.

⁴ Scholars in North America approach the question of limited entry in fisheries mainly from the point of view of economic efficiency. Application of limited entry in the Japanese fishery administration is based on much more diversified considerations. The transferability of licenses, which is an essential condition for maintaining economic efficiency under this system, has been subject to increasing constraints in Japan. While the old fishery law established fishing rights as freely transferable private properties, the new fishery law (1949) specifically prohibited transfer. The new law also prohibited in principle the transfer of licenses for offshore fisheries; in reality licenses were still transferable in most cases; but the 1963 revision of the law further restricted the transferability of licenses.

large vessels. The only major fisheries which do not fall in this category are the saury and squid fisheries, which are regulated by separate ordinances.⁵ Measures to further control the operation of the designated fisheries are provided in policies for licensing which are issued by the Ministry from time to time. Licensees of each of the designated fisheries are obliged to submit reports of their operation according to the format specified by the Minister.

In short, practically all important Japanese fisheries are strictly controlled by the central government under the licensing system. The administration of fisheries under this system is, of course, subject to pressures from different groups in the industry, including large fishing companies, vessel owner associations, and fishermen's associations, but changes in fishery policies are brought about only through this centrally controlled system. The system is also effective in accommodating such changes as the government and industry consider necessary for meeting new international developments. It is also responsible for the coexistence of many different types of fishing operation for catching the same species. For example, the present pattern of Japanese trawl fishing in the North Pacific, which employs all types of trawl gear and vessels of enormous size range, could not have developed without continuous manipulation of the system by the government under pressures from various sources.

REVIEW OF SELECTED HIGH SEAS FISHERIES

Most of the important Japanese fisheries are conducted on the high seas as defined by Japan. This review includes only those which have had or are likely to have international problems. Table 1 compares the catches (round weight) of such fisheries. Some of them, particularly trawl fishing by medium vessels and purse seining, are basically coastal, but they too have international implications in relation to the fisheries of Korea, China, and the Soviet Union.

⁵ These fisheries are still not subject to strict limited entry, but saury vessels and larger squid boats must be approved by the Minister and thus are subject to various regulations established by the central government.

TABLE 1.—Catches of marine fisheries, 1969.

Categories	Catch
	(Metric tons $\times 10^3$)
High seas salmon fisheries	123
Tuna and skipjack fisheries ¹	586
Trawl fisheries	
Distant water ²	2,290
China Seas	304
Coastal	608
Mothership crab fisheries	44
Distant-water longline/gill-net fisheries ³	27
Large and medium vessel purse-seine fisheries	1,041
Mackerel angling fishery	134
Saury fishery	51
Squid angling fishery	467
All other fisheries ⁴	2,301
Aquaculture ⁵	473
Total	8,449
Whaling	2,510 blue whale units 6,668 sperm whales (head) 627 small whales (head)

¹ Longline and pole-and-line (excluding catches by vessels smaller than 20 gross tons).

² Not including the China Seas.

³ Other than tuna longline fisheries.

⁴ Including inshore and coastal fisheries, as well as collection of clams (weight with shell) and seaweeds.

⁵ Including oysters (with shell) and seaweeds.

Source: Ministry of Agriculture and Forestry (Japan) (1971).

TRAWL FISHERIES

Developments in the Prewar Period

A wide variety of fishing operations can be found even within one technical category, trawling. The coastal waters of Japan are crowded with a vast number of small draggers employing a great many different types of gear; over 800 Danish seiners and nearly 200 pair trawlers operate on the continental shelf and slope around and near the Japanese islands; a few otter trawlers and about 670 pair trawlers fish in the East China Sea (including the Yellow Sea); a fleet of motherships and factoryships, with trawl catchers of various types, is sent to the Bering Sea and the northeast Pacific, and a large number of independent trawlers to waters off Kamchatka and the northern Kuriles; many large stern trawlers operate in the Bering Sea and the northeast Pacific, as well as in West African waters; an increasing number of Japanese trawlers are found in the Atlantic waters off North America; and a few vessels trawl in waters off New Zealand and South Arabia. A brief review of historical sequences of development of trawl fisheries in Japan will help one understand how such a complicated pattern has emerged in this particular sector of the industry.

Different types of draggers for bottom fish have existed for several hundred years, and some of the primitive kinds can still be seen in inshore waters. The enactment of a law providing various incentives for development of offshore fisheries in 1898 and the introduction of two European-type trawlers (one imported from England and one constructed in Japan) in 1908 marked the beginning of modern trawl fishing in Japan. The fishery expanded very rapidly, the number of otter trawlers reaching 136 by 1912. This resulted in serious conflicts with inshore fishermen, prompting the government to issue trawl fishery regulations establishing large closed areas in coastal waters and to stop the application of subsidies to trawlers under the promotion law.

These measures forced otter trawlers to move into the East China Sea, leading to the discovery of new abundant resources of groundfishes, particularly highly valued porgies (sparids). The colonial administration of Korea immediately established large closed areas to shut out these trawlers from its coastal waters, thus pushing the fishery farther offshore. High costs of operation and overproduction, combined with a great demand for large vessels during World War I, resulted in a drastic reduction of trawl vessels, with only six remaining in 1918. The government, in 1917, established a new set of regulations and limited the total number of otter trawlers to 70, with a minimum size of 200 gross tons. This maximum number of 70 remained unchanged for many years for otter trawlers in the East China Sea (including the Yellow Sea).

Among the primitive methods of catching groundfishes, wind-driven dragging and hand-hauling bottom fishing were considered most efficient in early years. With the introduction of powered vessels, the latter method developed into one somewhat similar to Danish seining. This fishery expanded very rapidly beginning in the 1910's and has since been a major source of conflicts between fishermen in inshore and coastal waters. The number of powered draggers exceeded 2,000 in the 1920's and became subject to new regulations in an attempt to control expansion and reduce conflicts with inshore

fishermen. Meanwhile, the method of trawling by two vessels was introduced in 1920 and this fishery, too, began to expand at a rapid rate. Pair trawlers immediately started fishing in the East China Sea; the government then took action to control pair trawling in waters west of long 130°E under a separate set of regulations, the practice still in effect today.

Although both pair trawling and Danish seining became subject to ministerial regulations, the authority to issue licenses for these fisheries still lay in the prefectural governors. As a result, the expansion of the pair-trawl fishery in the China Sea continued, the number of its vessels reaching nearly 700 plus some 400 operating from the Japanese fishing bases in mainland China and Taiwan. In 1933, the authority to issue licenses for both pair trawling and Danish seining was transferred to the central government. The government then instituted a long-term plan to reduce these vessels, particularly Danish seiners in waters east of long 130°E, which were causing serious overfishing and conflicts with inshore fishermen. The plan was implemented for several years with some success, but with numerous problems arising from the increasing number of illegal vessels and violations of closed areas. The power to issue licenses (east of long 130°E) was transferred back to the provincial governments during World War II and remained there until 1947 when it was again given to the central government. A new cycle of various efforts to control the expansion of Danish seining and pair trawling and reduce the numbers of these vessels began in 1950-51, when the nation was still under occupation.

Regulatory measures taken during the pre-war years to control the trawl fisheries of Japan established a pattern for allocating groundfish resources to different types of trawling: the stocks in coastal and nearby waters largely to the Danish-seine fishery (in the richest grounds off northern Honshu and Hokkaido) and partly to the pair-trawl fishery (in the western part of Japan); the stocks in the China Sea mainly to the pair-trawl and partly to the otter-trawl fishery; and the stocks in distant-water grounds to the otter-trawl fishery using large vessels.

Fishing in inshore waters was left largely to miscellaneous fisheries, including primitive draggers of various types. To a considerable degree, this pattern has persisted to the present, excepting some major changes in the allocation of fishing grounds in the northern North Pacific including west Kamchatka, the Bering Sea, and the Gulf of Alaska, as will be mentioned later. The coastal trawl fishery, mainly by Danish seines and partly by pair trawls, still remains the most difficult one from the point of view of fishery administration. Due to the long-established vested interests of different groups of vessels operating from different bases, the allocation of fishing grounds is extremely complex, as illustrated in Figure 1. In addition, there are closed areas around the home islands, some of which are rather extensive, different closed seasons applied in different areas, minimum depth limits in some places, as well as restrictions on the fishing bases each vessel can use for landing her catches.

Post-World War II Developments

East China Sea trawl fishery.—Most of the otter trawlers and many of the pair trawlers were sunk by American submarines during the war, in most cases while serving as military transport vessels, and only eight otter trawlers were left when the war was over. To meet the serious shortage of food after the war, the government provided many incentives for reconstructing and expanding the fishing industry. The China Sea being the best trawl area in the nearby waters, the fisheries there recovered very quickly in spite of the so-called MacArthur Line limiting their fishing grounds to a narrow area of the continental shelf of the East China Sea. Numerous violations occurred and the area was later expanded slightly, but it was with the coming into force of the peace treaty in 1952 that the main fishing area became legally available to the Japanese trawl fishery.

By that time, however, 58 otter trawlers and 783 pair trawlers had been licensed, with the total fishing power far exceeding that of the prewar years. The catch per unit of effort, which had shown a remarkable recovery during the war time, started to decline sharply. Fur-

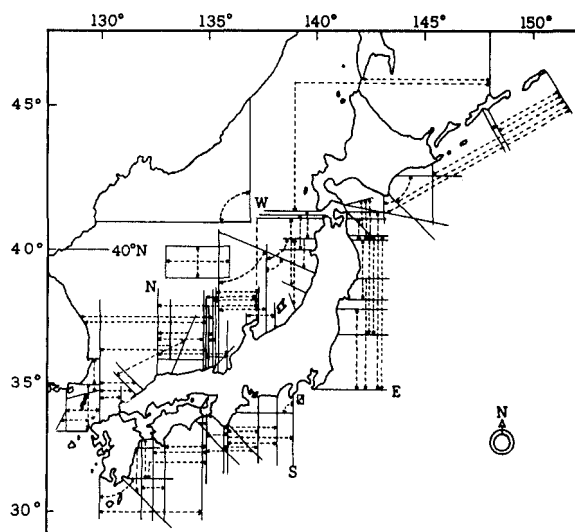


FIGURE 1.—Allocation of coastal trawl fishing grounds (from Norin Keizai Kenkyusho, 1965). Closed areas are not shown in the figure.

thermore, due to international disputes with South Korea and mainland China, various restrictions were imposed on fishing operations. The expansion of the fisheries of mainland China (estimated to take roughly 70% of the total groundfish catch from the East China Sea, including the Yellow Sea) also affected the Japanese catch. Increased fishing for China Sea shrimp (*Penaeus orientalis*) improved the situation for a while, but the relative importance of the East China Sea grounds decreased rapidly as trawl fishing expanded into more distant areas, particularly the Bering Sea. Many of the otter-trawl licenses were used for obtaining new licenses for distant-water fishing by larger vessels, and there were only seven otter trawlers operating in the East China Sea by 1969. The number of pair trawlers also decreased, but to a much lesser extent. The use of pair trawlers as catchers of the Bering Sea mothership fishery also contributed toward reducing fishing pressure. Fishing in the South China Sea was also resumed in 1952 but ceased almost completely as the main fishing area, the Gulf of Tonkin, became unaccessible due to the Vietnam War.

It is important to know how the Japanese government encouraged the license holders of the trawl fisheries to move into distant waters. A policy for the otter-trawl fishery was established as early as 1950; those wishing to use otter trawlers currently licensed for fishing in the China Seas, or those proposing to abolish licenses for China Sea fishing in return for trawling in distant waters, were given priorities. A new policy on the replacement of distant-water trawl licenses (issued in 1967) is summarized in Table 2 as an interesting example of license conversion.

Coastal trawl fishery.—The trawl fisheries in coastal and inshore waters fall in two categories in the fishery administration of Japan: (1) inshore fisheries conducted by various primitive

types of draggers of less than 15 gross tons each and (2) those by Danish seiners of over 15 gross tons and pair trawlers, pair trawlers being much less important except in the western part of Japan. What was referred to as the coastal trawl fishery in this section is the latter.^a By the time the authority to license the coastal trawl fishery in waters east of long 130°E was again transferred to the central government, Japan was left with some 2,500 vessels plus a substantial number of illegal boats, and the number further increased to a maximum of over 2,800 in 1951, when a new plan for reducing them was instituted.

^a The Japanese word for this category literally means "offshore powered trawl fishery."

TABLE 2.—Requirements for replacing a distant-water trawl vessel (in the North Pacific waters, including the Bering Sea, east of long 170°E, the Atlantic waters south of lat 40°N, and other distant areas) with a larger vessel.

Gross tonnage of existing license	Gross tonnage of new license	Licenses to be abolished
less than 550	up to 550	None
550-1,000	up to 1,000	None
over 1,000	over 1,000	None
less than 550	less than 1,000	(a) One or more distant-water trawlers, or (b) One or more Danish seiners (or pair trawlers) east of long 130°E with minimum aggregate tonnage of 50 RGT; or (c) One or more pair trawlers west of long 130°E; or (d) One or more large or medium purse seiners with minimum aggregate tonnage of 100 RGT; or (e) One or more distant-water tuna longliners with minimum aggregate tonnage of 300 RGT; or (f) One tuna mothership with three or more deck-loaded catchers.
less than 550	over 1,000	(a) Same as above; or (b) Two or more Danish seiners (or pair trawlers) east of long 130°E with minimum aggregate tonnage of 100 RGT; or (c) Same as above; or (d) Two or more large or medium purse seiners with minimum aggregate tonnage of 150 RGT; or (e) One or more distant-water tuna longliners with minimum aggregate tonnage of 600 RGT; or (f) One tuna mothership with three or more deck-loaded catchers.
550-1,000	over 1,000	(a) Same as above; or (b) One or more Danish seiners (or pair trawlers) east of long 130°E with minimum aggregate tonnage of 50 RGT; or (c) Same as above; or (d) One or more large or medium purse seiners with minimum aggregate tonnage of 50 RGT; or (e) One or more distant-water tuna longliners with minimum aggregate tonnage of 300 RGT; or (f) One tuna mothership with one or more deck-loaded catchers.

Source: Fishery Agency of Japan (1970).

Various measures were taken, including the combining of gross tonnages of smaller vessels to license a larger vessel, tighter control on illegal trawlers, compensations for giving up trawl fishing, and preferential licensing for transfer to other fisheries which were still in the process of expansion. During 1953-54, 285 licenses were transferred to other fisheries with compensations, a substantial number entering the tuna longline fishery. During 1954-56, when the salmon mothership fishery was still expanding rapidly, a large number of trawlers were converted into salmon catchers. Thus, a total of 910 licenses were taken out of the coast trawl fishery during 1953-56, with a total gross tonnage of 225,500 tons⁷ (Norin Keizai Kenkyusho, 1965).

The most effective measure taken to reduce vessels operating in coastal waters, however, has been the expansion of trawl fishing grounds, which began in 1954. Danish trawling was expanded successfully into waters around the southern Kuriles, offshore banks in the Japan Sea, waters along Sakhalin and the Japan Sea coast of the Soviet Union, and, finally, waters around the northernmost part of the Kurile chain and both coasts of Kamchatka. Expansion into the northern Kuriles and Kamchatka waters marked a new era for Japanese land-based trawl fishing. By then, the Bering Sea trawl fishery, both by mothership fleets and large independent otter trawlers, was in full blast, and the mothership trawl fishery in waters off west Kamchatka had also started. A separate set of regulations, therefore, was established for fishing by trawl vessels licensed under the category of the coastal trawl fishery (see footnote 6). Great operational difficulties were encountered by the vessels engaged in fishing in these areas during the initial period, for they were largely from the existing fleet of coastal Danish seiners. Priorities for licensing were given to those having vested interests in waters around Hokkaido. Fishing area was originally defined as north of lat 48°N,

⁷ The following numbers of trawl licenses were transferred to other fisheries, either converting vessels or giving up licenses in return for constructing new boats: 388 to the mothership salmon fishery as catchers, 102 to the tuna longline fishery, and 14 to the purse-seine fishery.

east of long 148°E, and west of long 170°E, but was later expanded eastward to long 170°W with the western boundary moved to long 153°E. The fishery has grown very rapidly since 1963, and the present fleet consists of nearly 200 vessels (now called "Hokutensen," meaning vessels transferred to the north), most of them newly built stern trawlers (the upper limit of their size is set at 350 gross tons). The total catch of the fleet is nearly comparable to that of the entire mothership trawl fishery in the Bering Sea. The main fishing grounds are still in west Kamchatka and the northern Kuriles, but the amount of fish taken from east Kamchatka and the Bering Sea is also considerable. Out of the total catch of 768,000 metric tons in 1969, 670,000 tons were Pacific pollack (*Theragra chalcogramma*).

A second government plan to further reduce trawl fishing in coastal waters (the third in the history of Japanese fishery administration) started in 1962, again through the transfer of licenses to other fisheries. By that time, however, most of the other fisheries had reached or were reaching a point of saturation, and the effects of this plan were not too great. Some 30 licenses were transferred to the tuna and skipjack fisheries; a few licenses were issued for trawling in West Africa at the expense of those for coastal trawling.

Some remarks may be appropriate for the handling of the inshore trawl fishery. Emphasis of the fishery administration was on reducing the number of vessels through compensations and subsidies. Over 30,000 vessels existed in 1950, of which only 7,000 carried licenses issued by prefectural governments, the remainder being illegal vessels. The central government established policies and guidelines for the handling of this fishery, which included the definition of inshore draggers (called small bottom draggers) as vessels of less than 15 gross tons each; the establishment of nationwide limits on the total number, the combined gross tonnage, and the aggregate horsepower; the establishment of a target for reduction, etc. During the period 1956-61, a total of 2,342 vessels were scrapped to be used for "tsukiiso" (objects sunk in shallow waters to attract fish), 2,379 diverted to other

fisheries, and 75 converted to transport boats. But as of 1969, there still existed about 29,000 vessels, indicating that the reduction plan was not very successful. The fishery, however, is of relatively minor importance in the Japanese industry, its total production in 1969 being only 262,000 metric tons, roughly half of which consisted of shellfishes.

Mothership trawl fisheries in the Bering Sea and adjacent areas.—In the Japanese regulatory system, a mothership means a vessel with processing facilities aboard which is accompanied by one or more fishing vessels. Most of the motherships do not fish themselves, but large fishing vessels, such as factory stern trawlers, or large tuna longliners, are also defined as motherships if they are used for processing catches delivered by smaller fishing vessels. The trawl fisheries in the Bering Sea, Kamchatka, the Aleutians, and the Gulf of Alaska consist of three licensing categories: "the Northern Seas Mothership Trawl Fishery"; "the Northern Seas Trawl Fishery" conducted by independent trawlers; and "Hokutensen," mentioned above. Catches by these three categories in 1969 were 862,000 metric tons, 373,000 tons, and 768,000 tons respectively, the combined total being 2.0 million metric tons.

Trawl fishing in the Bering Sea was carried out even before and during World War II. As early as 1933, two fish meal factoryships with catchers were sent to Bristol Bay. The operation stopped after 1937 due largely to unprofitable fish meal trade. A freezer mothership operated in the Bering Sea in 1940 and 1941; a mothership operation for frozen and salted fish was conducted in waters off west Kamchatka during the war. The postwar mothership trawl fishery began in 1954 with two freezer motherships, accompanied by catcher boats, mostly otter trawlers, to produce frozen flounders, particularly yellowfin sole (*Limanda aspera*) in the Bristol Bay area. The number of freezer motherships increased to four in 1956, and a fish meal factoryship entered the fishery in 1958, as well as a mothership bottom-longline fleet. By 1961, the fishery expanded to include five fish meal factoryships (including one for processing

Atheresthes for oil and meal) with 138 catchers, and 18 freezer motherships with 154 catchers. Three of the 18 motherships were specialized for shrimp fishing in an area near the Pribilof Islands, and eight (some of them were rather small) combined trawling, longlining (for halibut and sablefish), and gillnetting (for herring). The trawl catchers were from those licensed for fishing in the China Sea and coastal areas and included all three types: otter trawlers, Danish seiners, and pair trawlers. The Bering Sea trawl fisheries started as summer operations, but the season has since been extended, and some ships have been seen in the Bering Sea throughout the winter in the most recent years. For regulatory purposes, the Bering Sea was divided into several areas to allocate fishing grounds among different fleets taking into account their historical interests.

The next few years witnessed marked changes in the Bering Sea mothership trawl fishery. The yellowfin sole stock went down very quickly, as might have been expected for a hitherto unexploited flounder stock being subject to extremely intensive fishing, and also from past experience in waters along the Soviet coast (Kasahara, 1961). Thus, the operation of fish meal factoryships became unprofitable; this coincided with a slump in fish meal markets, both international and domestic. The number of factoryships manufacturing fish meal decreased from five (including one producing fish meal from *Atheresthes*) in 1961-62 to only two in 1963 (including one making a substantial amount of fish meal from *Atheresthes*), with the catch of flounders decreasing from 467,000 metric tons to less than 100,000 tons. A sharp decrease in the halibut catch, combined with a decline in the sablefish catch, made longlining less profitable. A sudden increase in herring production resulted in a market crisis. The shrimp fishery near the Pribilof Islands reached its peak in 1963 and declined rapidly thereafter. Meanwhile, emphasis has shifted from yellowfin sole to pollack, which is perhaps the most abundant species of commercial fish in the region. The introduction of a mechanized process to make minced pollack meat further boosted fishing for this species, and the catch has shown a phenomenal increase

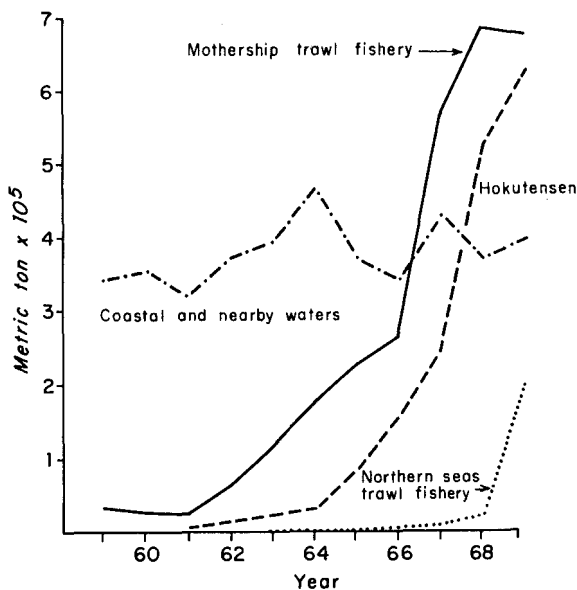


FIGURE 2.—Catches of pollack (*Theragra chalcogramma*) by Japanese fisheries, 1959-69 (from Ministry of Agriculture and Forestry, 1971).

(Figure 2). The number of vessels decreased to 12 motherships with 173 catcher boats by 1969, though with greater average tonnages of both motherships and catchers.

Trawl fishing in waters south of the Alaskan Peninsula began in 1960 when some of the catcher boats of a fish meal factoryship did exploratory fishing with trawls, longlines, and bottom gill nets. After 5 years of trial fishing, the government issued, in 1965, regular licenses for fishing in the Gulf of Alaska west of long 135°W under a different set of regulations. Exploratory fishing expanded into waters off British Columbia and the State of Washington. In 1967, the licensing of these vessels was combined with that of independent trawlers, mostly large stern trawlers, operating in the Bering Sea.

Independent trawlers in the northern areas.—Vessels in the category called “the Northern Seas Trawl Fishery” are licensed separately from vessels belonging to the mothership trawl fishery, but many of them are large stern trawlers sometimes accompanied by smaller trawlers

(before 1967, some of these trawlers had been licensed as motherships). Emphasis is on ocean perch in the Gulf of Alaska and the Aleutians and on pollack in the Bering Sea. Distinction between this fishery and the mothership fishery is somewhat arbitrary, but it is reasonably correct to say that the former consists mainly of large stern trawlers, while the latter include motherships and factoryships accompanied by smaller trawl vessels of different types. In the Japanese regulatory system, the vessels of the former category have been licensed, since 1967, for fishing in both the Bering Sea and the Gulf of Alaska, while those of the latter category have been allowed to fish in the Bering Sea only.

Thus, the northern trawl fisheries have undergone rapid changes in the past 15 years. The exploitation of many of the important stocks has reached or exceeded the level of maximum sustainable yield, including yellowfin sole, halibut, sablefish, ocean perch, and shrimp (*Pandalus borealis*) in the Bering Sea; ocean perch in the Gulf of Alaska; and perhaps some others. Soviet fishing for flounders and ocean perch had additional effects on these stocks. The Japanese fisheries in Kamchatka and the Bering Sea are now largely dependent on one species, pollack, to be processed into fish meal and minced fish meat (on motherships and factory trawlers, as well as on land). The total amount of pollack taken in the Bering Sea and Kamchatka by the Japanese and Soviet fisheries now probably exceeds 2.5 million metric tons. Fishing intensity is still mounting, and effects of fishing are becoming apparent. The catch per unit of effort in the southeastern part of the Bering Sea has shown a decrease, and the average size and age of fish also have decreased. Fishing grounds have spread over the deeper portions of the central Bering Sea shelf. Further improvements in the method of catching pollack are under study, for pollack occur not only near the bottom of the shelf and upper slope but also in mid-layers of deeper waters. The maximum level of exploitation will be reached fairly soon if it has not been already. There may be a further increase in the Japanese share of ocean perch in the Gulf of Alaska if Soviet efforts are drastically reduced. Japan has not fished for hake to any

extent, but the hake stocks have also been fished intensively by the Soviet Union. The potential of the herring stocks in the eastern Bering Sea, the cod stocks in the Bering Sea, and the sablefish stocks in southern areas are not well known, but it is not very likely that the catch of any of these species will substitute for a substantial portion of the present catch of pollack. As domestic markets for fish meal and minced fish meat remain strong, fishing pressure on pollack is bound to increase further.*

Certain actions by the Japanese government appear necessary in order to avoid a possible economic disaster: full assessment of the status of important stocks in the Bering Sea, Kamchatka, and the Gulf of Alaska; the establishment of catch quotas for pollack and a few other important species, in each of the three regions, in collaboration with the Soviet Union if feasible; and reallocation of fishing grounds among different sectors of the industry to make best use of the allowable catches. International problems arising from the development of trawl fisheries in the northern Pacific will be summarized in a later section.

Trawl fishery off west Africa.—The trawl fisheries in areas other than the northern North Pacific are licensed under the category "Far Seas Trawl Fisheries." The most important of these is the fishery along the west coast of Africa. The Soviet Union started trawl fishing off northwest Africa in the late 1950's and a few Japanese trawlers began fishing in 1959. In addition to local African vessels and Spanish and Portuguese boats, trawlers from a large number of non-African countries have fished in waters along the west coast of Africa. They include the Soviet Union, Japan, Poland, Italy, Israel, Greece, France, East and West Germany, Norway, Bulgaria, Romania, Belgium, South Korea, and China (Taiwan). The best trawl grounds occur in waters off northwest Africa and south-

west Africa, more or less corresponding to the areas of strong coastal upwelling, that is, along Spanish Sahara and Mauritania in the north, and Angola, South-West Africa, and South Africa in the south. Trawl fishing in west Africa is very selective as to species caught, except in the south where hake predominate in the catches of most fleets. Japanese fishing has been mainly for cuttlefish (mongoika), octopus, and porgies (sparids) in the north; hake, porgies, and jack mackerel around the Cape; and mostly hake in waters off Angola and South-West Africa.

In the early years, the Japanese government was reluctant to increase the number of licenses for fishing in Africa. As it became obvious that other nations were intensifying their effort rapidly, the government relaxed its licensing policy and the number of vessels increased to about 70 in 1967, most of them large stern trawlers. The total catch in 1969 was roughly 240,000 metric tons. The Japanese fleet has been facing difficulty due to a decrease in the catch per unit of effort of high priced species and the expansion of national jurisdiction by the coastal states.

Vessels operating in the north are mostly based in Las Palmas, and Cape Town is the main fishing base for those in the southernmost area. Catches have been sorted out at these bases for transshipment to Japan or export to other nations. Ghana, Italy, Nigeria, Greece, and Romania have been among the main importers of trawl fish caught by Japan. Substantial amounts have also been landed directly in African ports for local sales—Lagos, Monrovia, Tema, Free-town, etc.

Trawl fishery in the North Atlantic.—Japan has made a substantial effort to develop a trawl fishery in the main international fishing area of the northwest Atlantic, particularly off Newfoundland, but the attempt has been an almost complete failure. She has, however, established a fishery in waters farther south, mainly off New York, as an attempt to divert seasonally some of the vessels operating in African waters. Some trawlers now plan to stay there almost year round. Main species are squid, butterfish, and argentine, with a total catch of 9,000 tons in 1969. Exploratory fishing has also been con-

* A 5,000-ton factory stern trawler has come into operation and several more in the same class are under construction, all to fish in the northern North Pacific. The Soviet Union has greatly increased fishing for pollack. South Korea has also begun pollack fishing in the northern areas.

TABLE 3.—Catches (metric tons $\times 10^3$) of trawl fisheries in different categories, 1959-69.

Categories	1959	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969
Northern seas mothership trawl fishery ¹	169	472	639	534	338	438	404	454	778	844	862
Northern seas trawl fishery ²	2	—	4	6	18	29	⁸ 62	⁹ 97	123	193	373
Hokutensen ⁴	—	—	19	35	48	69	130	211	319	618	768
Atlantic and other seas	5	13	34	53	97	130	119	182	281	286	287
West of 130°E (China Seas)	357	368	375	331	345	302	325	334	338	326	303
Coastal trawl fisheries ⁵	521	632	632	629	594	655	677	574	528	583	572
Inshore dragnet fisheries	239	230	213	215	208	209	230	253	269	276	259

¹ North Pacific and adjacent seas. Including small catches by gill net and longline.

² North Pacific and Berling, east of long 170°E.

³ Including catches of the mothership fishery in the Gulf of Alaska.

⁴ North of lat 48°N, east of long 153°E and west of long 170°W.

⁵ East of long 130°E. "Offshore trawl fisheries" in Japanese terminology (see text).

Source: Ministry of Agriculture and Forestry (Japan) (1971).

ducted in waters off Florida. Although the New York fishery might expand further, it is unlikely to become a major trawl fishery comparable to that in Africa. Fishing in the North Pacific remains most attractive for large stern trawlers, and there are at present no plans to develop a major Japanese fishery in the main international fishing grounds of the northwest Atlantic.

Trawl fisheries in other areas.—Trawl fishing grounds in waters off New Zealand and Australia (west coast) were known to Japanese companies even before the war. Fishing after World War II started around 1959 largely for porgies (sparids). The trawl fishery off Australia has never developed to an important one, while trawling off New Zealand has expanded recently, the total catch in 1969 being 26,000 tons. Initially, the catch was mainly porgies (similar to Japanese "tai," *Chrysophrys*), but now barracouta (*Leionura*) is caught in large quantities, in addition to jack mackerel and porgies.

A Soviet fleet and some Greek trawlers fished in the Gulf of Aden along the South Arabian coast, before the closing of Suez, as well as in waters off northeastern Somalia. Soviet trawlers are fishing again along the Arabian coast. Japanese trawling in the Gulf of Aden began in 1966 for cuttlefish, porgies, and some other species; eight trawlers fished in 1967, with a total catch of 12,000 metric tons (Suisan-sha, 1970). This again has not developed to a major fishery.

Table 3 summarizes catches of the different trawl fisheries described in this section for the period 1959-69.

Mention should be made of the shrimp fisheries conducted by Japan in foreign countries after

World War II (the Japanese did some shrimp trawling in Mexican waters during the prewar years). The oldest of these is the one along the northeast coast of South America. Shrimp fishing there has been developed mainly by American operators since about 1955. The establishment of a shrimp processing plant in Georgetown (Guyana, then British Guiana) marked the beginning of large-scale shrimping in that part of the world. Processing plants have since been built in Paramaribo, Cayenne, Port of Spain, Barbados, Belém, etc., and several hundreds of American shrimp boats are operating under various arrangements with the local governments and business groups. Shrimp grounds are generally between the Orinoco River mouth and the Amazon River mouth, with best areas located along the Guianas and northern Brazil.

Japan started shrimping in the region around 1959 and developed a small fishery based in Paramaribo. The Japanese government tightly controlled shrimping in that region for unknown reasons until 1967 when it relaxed restrictions. The total number of vessels licensed reached 72, including 50 land-based vessels and 22 vessels conducting mothership-type operations. Main bases are Georgetown, Paramaribo, and Port of Spain. Initially, shrimp trawlers built in Japan were used, but practically the entire fleet now consists of standard Gulf of Mexico shrimp trawlers constructed in the United States. The Japanese firms have formed a joint company apparently for the purpose of negotiating local arrangements.

Japan has also engaged in joint ventures for shrimp in India, Australia, Madagascar, Malaysia (Sarawak), and other countries. Recent

emphasis is heavily on shrimp ventures in Indonesian waters. After conducting exploratory fishing, several companies now plan to establish facilities at shore bases. The best grounds are along the north coast of Sumatra, the south coast of Borneo (Kalimantan), and the south coast of West Irian.

SALMON FISHERIES

Japanese salmon fishing from the Russian territory began in the latter half of the 19th century. After the Russo-Japanese War, the two governments entered into negotiations on the question of Japanese fishing rights along the Russian coasts. The resulting treaty of 1907 (went into force in 1908) greatly facilitated the expansion of Japanese fishing activities from the Russian territory. The treaty recognized the rights of the Japanese to fish along the Russian coasts of the Japan Sea, the Okhotsk Sea, and the Bering Sea, including the entire coastline of Kamchatka, the most important salmon-producing area in Asia. A large number of lots for salmon trap fishing were distributed, by auction, between the Russians and Japanese (Leonard, 1944; Kasahara, 1961).

After the Russian Revolution, a temporary arrangement was made until a new treaty was signed in 1928 after long negotiations. The new agreement modified the arrangements of the 1907 treaty, but the rights of the Japanese to fish from the Russian territory were reestablished. The Soviet government thereafter tried to expand the fishing activities of its nationals by reducing the proportion of lots leased to the Japanese, resulting in continuous controversies and negotiations. The amount of Japanese fishing for salmon in the Soviet territory was reduced drastically after 1941, when the Pacific War broke out, and the entire fishery came to an end in 1944.

While negotiations for the allocation of fishing lots were going on between the two governments, the Japanese began to engage in a mothership-type salmon fishery in waters off Kamchatka (motherships were anchored outside the territorial sea). The fishery lasted from 1929 to 1942. More important was the development,

during the 1930's, of drift net and trap fishing based in the northernmost islands of the Kurile chain,⁹ which intercepted a large number of salmon on their way to the streams in the Kamchatka Peninsula and other areas of Russia. (See Kasahara, 1963, for catch statistics.) It appears peculiar that such new developments, which no doubt had substantial effects on inshore salmon catches, did not result in a serious controversy during the prewar period. If these off-shore fisheries had continued, difficult problems would have developed not only between Japan and the Soviet Union but also between different Japanese fisheries catching salmon. In any case, these developments clearly indicated what the Japanese might do if they were excluded from fishing salmon in inshore waters.

Article 9 of the San Francisco peace treaty states, "Japan will enter promptly into negotiations with the Allied Powers so desiring for the conclusion of bilateral and multilateral agreements providing for the regulation or limitation of fishing and the conservation and development of fisheries on the high seas." The North Pacific fishery treaty was signed on May 9, 1952, immediately after the peace treaty entered into force on April 28 of the same year.

Expecting the abolishment of the so-called MacArthur Line restricting Japanese fishing grounds during the occupation period, the Japanese government issued, early in 1952, its policies on the resumption of the high seas salmon fishery. Three motherships with 50 catchers and 12 scouting boats were licensed. Each of the three biggest fishing companies, Taiyo, Nippon Suisan, and Nichiro, was authorized to operate one mothership, with Danish seiners from the coastal trawl fishery east of long 130°E (mentioned previously) employed as catcher boats. The fleet left Japan just 3 days after the peace treaty came into force. Although the North Pacific treaty had not been ratified by Canada, fishing was authorized only in waters west of long 175°W and between lat 48°N and 55°N; waters off Kamchatka and the northern Kuriles were avoided. The fishery differed entirely from

⁹ The entire Kurile Islands and the southern half of Sakhalin belonged to Japan until the end of World War II.

the mothership fishery before World War II, which was conducted in waters very close to the Kamchatka Peninsula. The result was a smashing success, and this set a pattern for further development of the mothership salmon fishery on the high seas. The land-based drift-net fishery, too, operated in a large area of the high seas; 1,500 drift netters fished for salmon, mostly pink salmon heading for Soviet streams. The government issued new regulations for the land-based drift-net fishery.

By 1955, the mothership expanded to 14 motherships, including 2 in the Okhotsk Sea, with 344 catchers and 58 scouting boats; the land-based drift-net fishery was conducted by 325 larger vessels (over 30 gross tons) licensed by the central government and more than 1,200 smaller vessels licensed by the prefectural governments. The mothership fishery took 64 million salmon (in number of fish) and the land-based fishery 47,000 metric tons (in round weight). Japan had planned to increase the number of motherships to 19 in 1956 with a corresponding increase in the number of catcher boats.

In February 1956, the Soviet Union took unilateral action to restrict high seas salmon fishing in the northwest Pacific (west of long 170°E). The two governments entered into negotiations for a fishery treaty, which was concluded on May 15 and entered into force a few months later. The diplomatic relations between the two nations were restored later in the year. The new fishery treaty set forth a wide variety of regulations, including large closed areas, closed seasons, catch quotas, restrictions on fishing gear, and arrangements for enforcement (a system of inspection by the Soviet authorities). Many changes have taken place since then, including the development of a large longline salmon fishery on the high seas and a substantial salmon fishery in the Japan Sea, expansion of the regulatory area, changes in the allocation of fishing grounds and catches between different Japanese fisheries, the closure of the entire Okhotsk Sea, and continuous modifications of the domestic regulations to meet the international situation. The pattern of salmon fishing as of 1969 is summarized in Figure 3. The number of catchers has been reduced substantially by transferring

their licenses to the tuna longline fishery and the northern trawl fishery. Due to expansion of the regulatory area and a continuous reduction of the catch quota under the treaty, which was considered necessary by the Soviet Union for conservation, the total take of salmon by Japan (including small amounts of salmon destined for Japanese streams) decreased from 197,000 metric tons in 1958 to 141,000 metric tons in 1969 (Ministry of Agriculture and Forestry, 1971).

In short, the expansion of the Japanese high seas salmon fisheries came to an end already in the 1950's when regulatory measures under the Japan-Soviet fishery treaty were applied to practically all areas of the northwest Pacific in which salmon were found. Offshore fishing must have had adverse effects on the salmon stocks in general, but the exact nature and extent of such effects are not well understood from the data and information exchanged through the Japan-Soviet fisheries commission.

The eastern boundary of the offshore salmon fishing grounds was established at long 175°W under the North Pacific treaty. In spite of extensive research conducted on the offshore distribution of salmon, resulting in a wealth of scientific information, and continuous hard negotiations between the national sections of the North Pacific fisheries commission, this provisional line has remained unchanged to date. Substantial quantities of Bristol Bay sockeye salmon have been taken by the Japanese mothership fishery in years of large runs, but none of the three parties has seriously considered the termination of the treaty, which could have been done at any time after 1963 with 1 year's advance notice. Thus, the provisional line drawn in 1952 has proved to be a good political compromise as far as these three countries are concerned.

CRAB FISHERIES

Three species of king crab (*Paralithodes*) and tanner crab (*Chionoecetes* spp.) have been exploited by the high seas crab fisheries in the northern North Pacific. The most important are the true king crab (*P. camtschatica*) and the tanner crab. Abundant resources occur in

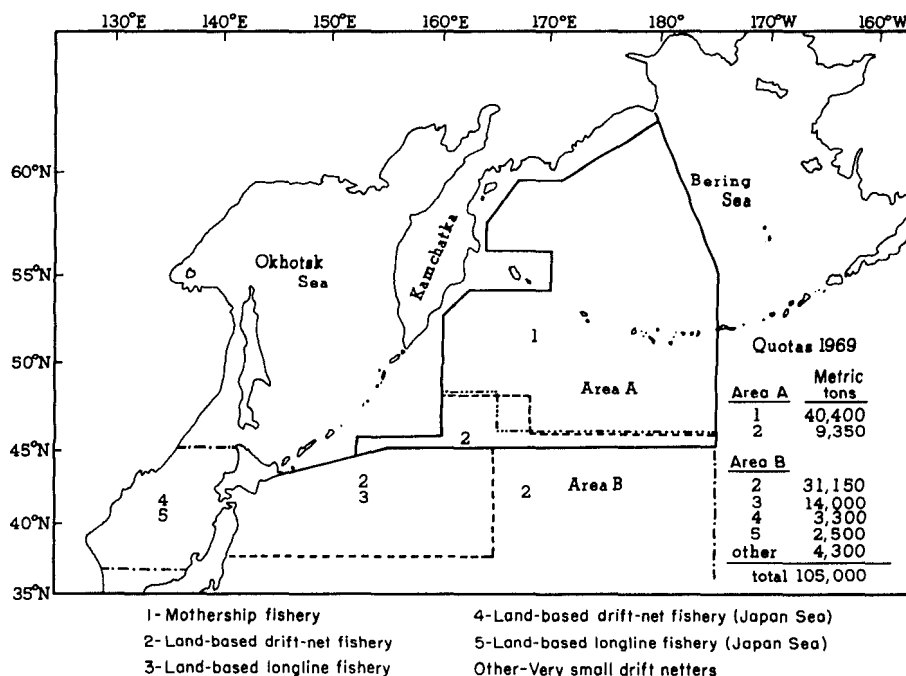


FIGURE 3.—Allocation of high seas salmon fishing grounds, 1969 (from Suisan-sha, 1970).

waters off northern Japan and Sakhalin, Kamchatka (particularly the west coast), the eastern Bering Sea, and the east Aleutian-Kodiak area. Land-based crab fishing for manufacturing canned crab dates from 1905; it expanded from Hokkaido to Sakhalin and the northern Kuriles. Exploratory attempts for fishing with motherships began in the 1910's along the west coast of Kamchatka, and commercial fishing of this type started in 1921. Stimulated by growing international markets for canned crab, the fishery expanded rapidly and the government, as usual, issued king crab mothership fishery regulations in 1923. The number of motherships was limited to 18 in 1927. Attempts were also made to develop crab resources along the east coast of Kamchatka without much success. The mothership crab fishery in Bristol Bay began in 1930 and continued until 1939 (no fishing in 1931). It never developed to a major fishery before World War II, only one mothership operating in most years. Crab fishing from the Russian territory was first conducted in connection with salmon fishing, but it was in 1920

that an official arrangement was made between the Russian and Japanese governments to permit Japanese crab fishing from the Russian territory (west coast of Kamchatka) under Russian regulations. (The Japanese salmon and crab fisheries from the Russian territory were practically monopolized by one company, Nichiro.) Both mothership crab fishing and land-based fishing employed tangle nets; motherships carried small powered boats called "kawasakisen" to do the fishing and were equipped with canning lines to process crabs aboard.

As in the case of the salmon mothership fishery, the Japanese government issued its policies on the resumption of the Bristol Bay crab mothership fishery prior to the entering into force of the peace treaty in 1952. Because of political repercussions from the United States, no fishing was authorized in that year, and only one mothership was licensed for 1953 as a joint operation by the three biggest fishing companies, Taiyo, Nippon Suisan, and Nichiro. Specific regulations were issued to limit the number of deck-loaded boats as well as self-navigating fishing

vessels (for scouting and setting nets), the amount of canned crab produced, and the amount of tangle nets used. This form of operation continued until 1959 without a major expansion, except for a substantial increase in the production quota in 1959. A second mothership fleet was authorized to operate in the Bering Sea in 1960 to produce frozen crab. The fishery thereafter grew very rapidly until 1964, when a record catch of over 10 million crab was made.

Having declared exclusive rights to exploit king crab resources under the 1958 continental shelf convention (entered into force in 1964), the United States initiated, in 1964, negotiations with Japan concerning the crab fishery in the eastern Bering Sea. Since then, the Japanese catch has been reduced continuously under international agreements between the two governments.

The first Soviet mothership crab fleet entered the eastern Bering Sea in 1960, resulting in direct competition with the Japanese fishery. The U.S. crab fishery in the Bering Sea remained of minor importance through 1963, with no fishing conducted in some years. U.S. vessels from Kodiak and adjacent areas moved into the Bering Sea in 1964 and their catch has been increasing since then. Traditionally, Japanese fishing was by tangle nets and U.S. fishing in waters south of the Peninsula was by pots (some U.S. vessels used to trawl for crab in the Bering Sea). Now pot fishing is conducted both by the Japanese and the Americans, complicating the situation further. The Japanese and the Soviets have also developed a system of allocating tangle-net fishing grounds between their fleets. As the eastern Bering Sea king crab stock began to show signs of depletion, Japan intensified fishing for tanner crab, which is also very abundant in the eastern Bering Sea. Tanner crab fishing is now as important as king crab fishing and, through a quota, under control by the Japan-United States agreement.

The Japanese mothership crab fishery in waters off the west coast of Kamchatka (the most important king crab fishing area) was resumed in 1955, before the conclusion of the Japan-Soviet fishery treaty, and became subject to the provisions of the treaty in 1957, which

covered two species of king crab, *P. camtschatica* and *P. platypus*. The regulations under the treaty were applied to both the Japanese and Soviet mothership fleets, with Japanese share decreasing since 1965. As a party to the 1958 continental shelf convention, the Soviet government declared, in 1968, its exclusive rights to natural resources of the continental shelf adjacent to its territory. Although Japan was not a member of the convention, she agreed, in 1969, to negotiate a separate arrangement for crab fishing, which resulted in a 1-year agreement specifying the catch limits of different species of crabs for the Japanese fisheries in designated areas, as well as the number of motherships or fishing vessels to be used for crab fishing. Thus, not only crab fishing on the west coast of Kamchatka for king crabs but also tanner crab fishing in the western Bering Sea, as well as fishing for a variety of crabs in waters off the southern Kuriles and Sakhalin became subject to regulation. The agreement has since been revised year after year. The complex legal arrangements for crab fishing in the northern North Pacific will later be reviewed in some detail.

TUNA FISHERIES

Japan had a tuna fishing fleet consisting of about 2,000 vessels before the war, but they were largely small boats operating in waters not too far from the home islands. Pole-and-line skipjack fishing was much more important than longline tuna fishing, with the bulk of the vessels carrying out both.¹⁰ Skipjack fishing was also conducted from various bases in the present Trust Territory of the Pacific Islands. Although tuna are caught by other types of gear, particularly purse seine (also by traps in small quantities), the Japanese tuna industry consists largely of the longline tuna fishery and the pole-and-line skipjack fishery, the latter taking a sub-

¹⁰ A complete account of the Japanese tuna industry up to about 1962 is given in Masuda (1963, in Japanese). In the Japanese language, skipjack ("katsuo") is distinguished from larger tunas ("maguro"). Substantial quantities of billfishes and swordfish are also caught by tuna longline; they are generally called "kajiki."

stantial amount of albacore also. While a number of vessels still conduct both types of fishing, distant-water tuna fishing is almost exclusively by longliners. The main grounds of the skipjack fishery are still in waters relatively close to the Japanese islands, including those adjacent to the Trust Territory of the Pacific Islands. In the licensing system of Japan, tuna and skipjack fisheries have always been combined, mainly because the tuna longline fishery originally developed as a part-time operation of skipjack pole-and-line vessels.

Under the new fishery law (1949), all tuna and skipjack vessels larger than 20 gross tons were required to obtain licenses issued by the Minister of Agriculture and Forestry, thus coming under full control by the central government. They were further divided between those below and above 100 gross tons, called the "medium vessel tuna-skipjack fishery" and the "far seas tuna-skipjack fishery," respectively. In 1953, after abolishment of the MacArthur Line, the Japanese government enacted a law to provide a preferential treatment of licenses for larger tuna vessels (over 70 gross tons) until 1955, as an attempt to develop tuna fishing in waters farther from the home islands. The law encouraged licensees to replace small vessels with new larger vessels and also accommodated the entry of operators from other fisheries, particularly the coastal trawl fisheries. A further policy was issued in 1955, allowing vessels in the category of the medium vessel tuna-skipjack fishery to combine their gross tonnages to obtain licenses for new larger vessels under the category of the "far seas tuna-skipjack fishery." A number of licenses were also transferred from the salmon fishery to the tuna fishery as the number of vessels in the former had to be reduced as a result of the Japan-Soviet fishery treaty.

Further changes were made thereafter to establish a new category for the mothership-type tuna fishery with deck-loaded catchers and to abolish the distinction between the above-mentioned two categories, with vessels less than 40 gross tons removed from the licensing system. As fishing by vessels less than 40 gross tons became free of license limitations, the number of such boats increased at a rapid rate with their

fishing grounds expanded to both sides of the equator.¹¹ The government in 1963 put the licensing of tuna vessels over 20 tons again in two categories divided at 50 gross tons, which was later raised back to 70 gross tons. In short, the government encouraged the tuna fishery (particularly longline fishing) to expand into waters farther from Japan with larger vessels, and also used the tuna fishery for reducing the number of licenses in other overcrowded fisheries.

This policy contributed to the rapid expansion of tuna longline fishing grounds. By 1960, the Japanese tuna fleet had covered the main longline fishing grounds in the North and South Pacific and the Indian Ocean. Longlining in the Atlantic started in 1957 and the major Atlantic tuna grounds had been fished by 1962. Fishing grounds further expanded thereafter, though more gradually. Fishing for southern bluefin tuna ("minamimaguro," *Thunnus maccoyii*) in waters off New Zealand and southern Australia has been intensified greatly in recent years since new freezing equipment was introduced to produce frozen tuna meat of highest quality. The strength of the Japanese tuna longline fishery as a whole reached its highest point in 1962; the industry has been on the decline since then, with Taiwan and South Korea increasing their shares. Japan still has advantages over Taiwan and other longline fishing nations in some respects. It has a tremendous trade network developed by trade companies to market tuna anywhere in the world; the catches of many Taiwanese and South Korea longliners are transhipped through foreign bases under the management of these Japanese trade companies. High-quality bluefin is sold in Japan at a fantastic price. Japan also has strong markets for bigeye, billfishes, and other species that have no or very limited markets in the United States. But as far as tuna production is concerned, Japan's share will decrease further. In addition to Taiwan and Korea, Ryukyu has a sizable longline fleet, which will become part of the Japanese tuna industry when Okinawa is returned to Ja-

¹¹ In the Japanese practice, the actual gross tonnage of a vessel is substantially greater than the registered gross tonnage (RGT) in most cases.

pan. Cuba operates a small fleet in the Atlantic; the Soviet Union has a mothership tuna fishery of relatively minor importance. Most of the attempts by other nations to develop a tuna longline fishery have failed. (Venezuela has a fleet of small longliners. The fishery is protected by regulations prohibiting the import of tuna and tuna products.)

Tuna longlining is conducted in a variety of ways. The bulk of Japanese vessels still operate from Japan, but a large number also use foreign bases. In the South Pacific, catches are delivered to American Samoa, Espiritu Santo (New Hebrides), and Fiji. Penang and Port Louis (Mauritius) have been the main bases in the Indian Ocean. Mombasa is a base established recently. Vessels operating in the Atlantic have delivered their catches to such ports as Las Palmas, Abidjan, Cape Verde Islands (Portuguese possession), Tema, Cape Town, Port of Spain, etc. St. Martin Island in the Caribbean has been an important base in recent years. (See Broadhead, 1971, for a description of international tuna trade.) Many of these foreign transshipping bases now receive more fish from Taiwanese and Korean vessels than from the Japanese boats. Mothership-type tuna longlining has also been conducted both with self-navigating catchers and with deck-loaded boats, but the former type has ceased to exist. The mothership fishery with deck-loaded catchers has developed largely in the last 15 years although some experiments were conducted even before World War II. Each mothership, which also does fishing in most cases, carries 1 to 8 fishing skiffs. The catches of the different types of tuna fisheries are compared in Table 4.

It has been demonstrated that the catch per unit of effort in any region quickly decreases as

the amount of longline fishing increases. It is also apparent that the total longline catches of yellowfin, albacore, bigeye, and bluefin tunas from the world ocean will not show substantial increases as fishing is further intensified although the proportions taken by the different longline fishing nations will change further.

The pole-and-line skipjack fishery operates relatively close to Japan, but a large number of vessels now fish in waters around the Trust Territory of the Pacific Islands (from bases in Japan). The fishery also takes a substantial amount of albacore; some vessels still conduct both pole-and-line skipjack fishing and tuna longlining.

Some tunas and skipjack are caught by purse seiners in waters close to Japan. A few tuna seiners have been operating in West Africa. The Japanese have also been trying to establish a purse-seine fishery in the eastern tropical Pacific, so far without success.

OTHER FISHERIES

Some of the other fisheries, principally those conducted around the Japanese islands, have had or are likely to have some international implications. These include, among others, the purse-seine fisheries for coastal pelagic fish, the saury fishery, and the squid fishery. The kelp fishery around the southernmost islands of the Kurile chain is also an international issue.

Most of these fisheries depend on the resources of coastal pelagic species in waters around Japan. The combined catch of main coastal pelagic species in *temperate waters*, including anchovy (*Engraulis*), sardines (*Sardinops* and *Etrumeus*), jack mackerels (mainly *Trachurus* and *Decapterus*), mackerels (two species of *Scomber*), saury (*Cololabis*), yellowtail (*Seri-*

TABLE 4.—Catches (metric tons $\times 10^3$) of Japanese tuna fisheries.¹

Years	Oceans			Longline					Pole-and-line ⁴	Seine	Trap	Others
	Pacific and Indian	Atlantic	Total	Home-based	Foreign-based ²	Atlantic	Mother-ship ³	Total				
1962	395	55	450	275	23	55	51	404	21	16	3	6
1969	299	33	333	220	12	13	31	275	43	8	2	5

¹ Bluefin, southern bluefin, albacore, bigeye, yellowfin, and some small tunas.

² Other than Atlantic.

³ With deck-loaded catchers.

⁴ Mainly albacore.

Source: Ministry of Agriculture and Forestry (Japan) (1971).

ola), and common squid (*Ommastrephes*), was about 2.7 million metric tons in 1969¹² out of the total Japanese catch of all marine fishes and shellfishes of 7.7 million tons (round weight, not including aquaculture), indicating the importance of this group of species.

After the catastrophic decline of the sardine catch (Kasahara, 1961) fishing for other pelagic species, particularly those mentioned above, became increasingly intensive. Saury fishing with "boke-ami" (stick-held lift net with fish-attracting light) started in 1947, and the catch soon reached to a level of 500,000 metric tons a year. It has been on the decline since 1962 (Figure 4). The catch of jack mackerels started to climb sharply around 1949, with some signs of an increase in abundance, and exceeded 500,000 tons (*Trachurus* alone) in 1960; it has since been decreasing. The mackerel yield began to rise also in the late 1940's and it is still going up. The catch of anchovies has been fluctuating at around 300,000 to 400,000 tons a year since the early 1950's (Figure 5). The yield of squids, mostly common squid, also rose markedly after the war and has shown rather violent fluctuations in recent years (Figure 6). All of these species have been under intensive fishing for the last 20 years or so, but their catch trends have been rather different from each other. A variety of biological problems are involved, many of which are poorly understood. The catches of the Soviet Union and South Korea are also indicated in the figures wherever data are available.

The rapid development of fishing for mackerel and jack mackerel resulted in a serious conflict with the South Korean fishermen, which will be mentioned later. The Soviet vessels have been catching an increasing amount of mackerel in waters off northern Japan. The decline of the saury catch has prompted some of the Japanese companies to apply for exploratory fishing in waters of the eastern Pacific, particularly off Canada and the United States. In 1969, about 38 applications were approved by the Japanese government, but only about half of them conducted fishing, mainly off Canada and the United

¹² Perhaps 3 million metric tons if miscellaneous species are included.

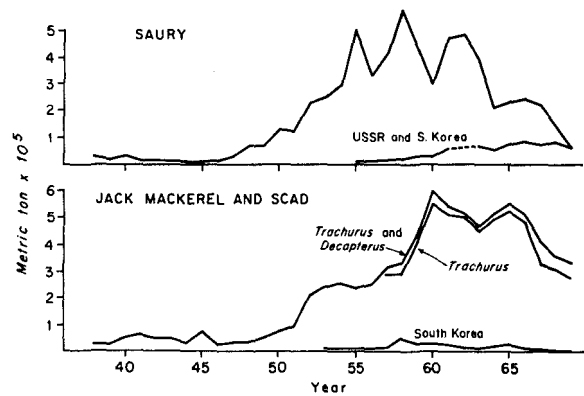


FIGURE 4.—Catches of saury and jack mackerel in Japan, 1938-69 (from Ministry of Agriculture, 1962-1971).

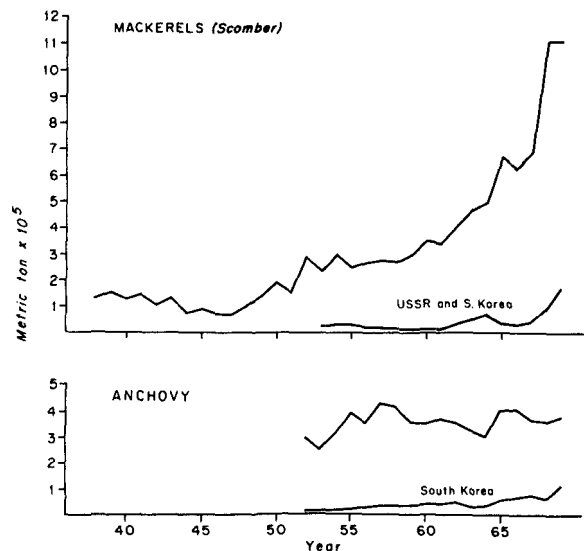


FIGURE 5.—Catches of mackerels and anchovy in Japan, 1938-69 (from Ministry of Agriculture and Forestry, 1962-71). USSR mackerel catches are only rough estimates.

States. The result was not very encouraging, but exploratory fishing will continue, depending to some extent on the saury catch in waters off Japan (there was a slight recovery in 1970) and the trend of the saury market. The Soviet catch of saury in waters off northern Japan and the Kuriles, in competition with the Japanese, has become substantial in recent years. A complicated international situation has developed con-

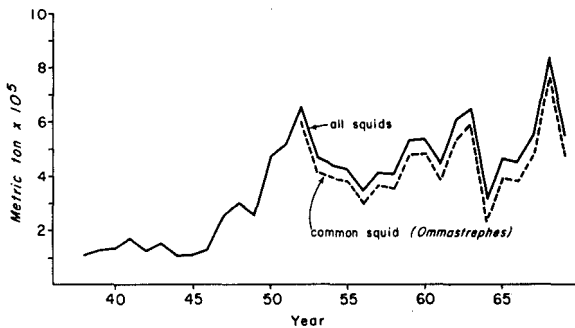


FIGURE 6.—Catches of squids in Japan, 1938-69 (from Ministry of Agriculture and Forestry, 1962-71).

cerning the Japanese kelp fishery in inshore waters around the southernmost islands of the Kurile chain occupied by the Soviet Union.

At the moment, squid fishing by Japan has no international implications, but the squid resources in the North Pacific appear to be among the most important potential resources for the future. Since species similar to the common squid occur in great quantities in the eastern Pacific, in waters of national jurisdiction as well as on the high seas, the exploitation of squid might become an international issue in the future. (A survey of squid resources off California is now under consideration in Japan.)

INTERNATIONAL ARRANGEMENTS

INTERNATIONAL PROBLEMS ARISING FROM THE POSTWAR EXPANSION OF JAPANESE FISHERIES

Period of Occupation

International conflicts arising from the prewar development of Japanese fisheries are summarized by Leonard (1944). Japan was involved in four major international issues concerning fisheries: the Russo-Japanese controversy; the North Pacific fur seal controversy; international problems of Antarctic whaling; and the Alaska salmon fishery issue. Except for the first one, which was resolved by the war itself, these controversies remained unsettled. The nature of the problems will be reviewed retro-

spectively in connection with postwar developments.

The Japanese fishing industry was half destroyed during the war with most of the larger fishing vessels sunk by American submarines. Large fisheries developed by the Japanese in Korea, Taiwan, Sakhalin, and the Kurile Islands were completely lost as these areas became independent or were taken by the Soviet Union. Japan also lost historical rights to fish in Kamchatka and other Far Eastern areas of the Soviet Union. The total catch decreased to less than 2 million metric tons in 1945, the last year of the war. The rebuilding of the industry started as early as 1946. Pressed by the immediate need to feed the nation and to earn foreign exchange, the government provided tremendous incentives for the industry to expand as fast as possible.

The first international problem faced by Japan was the area restriction imposed on her fisheries by the Allied Powers. Both government and industry strongly urged the expansion of the authorized fishing area. The area was expanded to the west to include a substantial portion of the east China Sea continental shelf (1946) and to the east and the south to permit tuna and skipjack fishing in vast areas of the western Pacific (1946, 1949, and 1950). As of 1950, however, the authorized area was still restricted to waters north of the equator and west of long 180°, except for Antarctic whaling, which was resumed in 1946.

Pressure was mounting in the United States and Canada to restrict Japanese high seas fishing as a condition for the restoration of diplomatic relations. Two international problems of the prewar period should be mentioned in this connection. During 1936-38, Japanese exploratory fishing vessels appeared in the eastern Bering Sea and caught salmon. This triggered tremendous reactions from the American industry, administration, and Congress. Legislation was introduced in Congress calling for the exercise of jurisdiction on the high seas, and a variety of views were expressed on the legal basis for taking such an action. The Japanese government finally agreed to keep its vessels from fishing salmon in waters off Alaska, without prejudice to Japanese rights under international law

(Leonard, 1944). The question of whether the United States had an exclusive right to exploit the salmon stocks was not discussed in legal terms, but the general feeling among the American people was that these salmon really belong to them. The above instance had a great impact on the attitude of the Americans toward the development of Japanese high seas fisheries after the war. Another prewar issue, which affected the reputation of Japan as a fishing nation, was the abrogation of the 1911 fur seal treaty by Japan.¹³ The Japanese government claimed, without substantiating scientific evidence, that the increase in the fur seal population as a result of protection provided by the treaty was causing serious damage to their fisheries.

As the question of Japanese fishing became a very serious issue which might delay the conclusion of the peace treaty, the United States and Japan agreed to deal with problems further in an exchange of letters between the Japanese Prime Minister (Shigeru Yoshida) and the American Ambassador (John Foster Dulles) in February 1951. The prime minister's letter stated, ". . . the Japanese government will, as soon as practicable after the restoration to it of full sovereignty, be prepared to enter into negotiations with other countries with a view to establishing equitable arrangements for the development and conservation of fisheries which are accessible to the nationals of Japan and such other countries.

"In the meantime, the Japanese government will, as a voluntary act, implying no waiver of their international rights, prohibit their resident nationals and vessels from carrying on fishing operations in presently conserved fisheries in all waters where arrangements have already been made, either by international or domestic act, to protect the fisheries from over-harvesting, and in which fisheries Japanese nationals or vessels were not in the year 1940 conducting operations. Among such fisheries would be the salmon, halibut, herring, sardine, and tuna fisheries in the waters of the Eastern Pacific Ocean and Bering Sea." (Fishery Agency of Japan, 1953.)

¹³ A notice was given in 1940 and the treaty terminated in 1941. To continue protective measures in the northeast Pacific, a provisional agreement was made between the United States and Canada.

The question of fur seal was dealt with in an exchange of memoranda in April 1951. The Japanese memorandum stated, "The Japanese government has no objection to the interpretation of Prime Minister Yoshida's letter of February 7, 1951, as extending to pelagic fur sealing. That is to say, pending the conclusion of a new convention on the subject after the coming into force of a peace treaty, the Japanese government will, implying no waiver of their international rights, voluntarily prohibit her nationals or vessels from carrying on pelagic fur sealing in the waters in question, and is moreover prepared to enter into negotiations toward the conclusion of a new convention."

Despite strong pressure from some sectors of the U.S. fishing industry, the United States government had managed not to include specific fishery articles in the draft peace treaty, except for Article 9 which set forth Japan's obligation to enter into negotiations with Allied Powers so desiring for the conclusion of bilateral and multilateral agreements on high seas fisheries. Negotiations for a tripartite fisheries convention between Canada, Japan, and the United States began on November 5, 1951, and were concluded on December 14. The Japanese delegation was shocked by the United States-Canada proposal for adoption of the abstention principle, which was an extreme form of resource allocation, not so much because Japan would have to refrain from fishing for North American salmon, halibut, and herring, but because of the potential effects of the adoption of such a principle on future fishery negotiations with other countries. Japan had no choice, however, and the treaty¹⁴ was signed (on May 9, 1952) immediately after the entering into force of the peace treaty (April 28, 1952).¹⁵ Except for those provided by the North Pacific fisheries convention, all restrictions on Japanese high seas fishing were removed.

¹⁴ International Convention for the High Seas Fisheries of the North Pacific Ocean. The ratification of the treaty by Canada was delayed until 1953 due mainly to objections from the fishermen's union on the Pacific coast.

¹⁵ Signed by 48 nations of the Allied Powers and Japan. Two separate peace treaties were signed, one with India and one with the Republic of China, both entering into force in 1952.

Implementation of the North Pacific Fisheries Convention

Since the establishment of the International North Pacific Fisheries Commission (INPFC) under the convention, two aspects of the implementation of the treaty provisions have been subject to intensive discussion between the representatives of the three governments: the possibility of moving the salmon abstention line (provisionally established at long 175°W) on the basis of scientific evidence and the question of whether the stocks on the abstention list continued to qualify for abstention. An enormous amount of research effort has gone into the study of the offshore distribution of all species of salmon, resulting in convincing evidence that a substantial portion of the North American salmon, particularly Bristol Bay sockeye salmon, enter the waters west of long 175°W and that, on the other hand, substantial numbers of Asian chum and pink salmon migrate into the waters east of long 175°W.¹⁶ As the commission's recommendations have to be made unanimously, no action has been taken for moving the provisional line in either direction.

The convention provided that, during the initial 5-year period, no examination or recommendation be made as to whether the stocks continue to qualify for abstention. The period expired in 1958 and subsequent examinations of qualifications for abstention have resulted in some changes in the stocks on the abstention list. The following stocks have been removed from the list: the herring stocks off the coast of Alaska south of the Alaskan Peninsula and east of the meridian passing through the extremity of the Alaskan Peninsula; the herring stocks off the coast of the United States, south of the entrance to the Strait of Juan de Fuca; the herring stocks off the west coast of the Queen Charlotte Islands; and most important, the halibut stock of the eastern Bering Sea.¹⁷

¹⁶ For the results of scientific investigations, see papers in *Bulletins of the International North Pacific Fisheries Commission*, for example, Margolis (1963), Kondo et al. (1965), Hartt (1966), Margolis et al. (1966), Neave, Ishida, and Murai (1967), Shepard, Hartt, and Yonemori (1968).

¹⁷ While the removal of the herring stocks may have been partly to demonstrate the workability of treaty provisions, that of the Bering Sea halibut stock was an issue of practical importance to all parties.

The convention could be terminated by any one of the contracting parties serving 1-year notice after a period of 10 years, that is, June 1963. The Japanese government proposed negotiations for a new convention, which would eliminate the abstention principle, and such negotiations have been held several times since 1963, with no result. The United States and Canada would not consider abolishing the abstention principle. Japan, too, appears to have carried out negotiations more as a political gesture than a serious attempt to change the *status quo*.

The North Pacific Fisheries Commission has broadened its scope of operation to some extent by including serious discussions on the crab stocks in the eastern Bering Sea and the groundfish stocks in waters off the United States and Canada. In the earlier years, unofficial and temporary agreements were made as to the extent of Japanese fishing for groundfish in the Gulf of Alaska, as well as the way Japanese crab fishing is to be conducted in Bristol Bay. These aspects are now dealt with under separate bilateral, executive agreements between the two governments. The Commission has also been publishing results of research conducted by the national agencies of the three nations under its auspices, as well as fishery statistics on such stocks as salmon, halibut, herring, king crab, tanner crab, and groundfish.

In short, none of the parties have seriously considered abolishing arrangements under the treaty, particularly that for salmon. Both Canada and the United States seem to be satisfied that the treaty protects the North American salmon stocks just as well as any other international agreement that can realistically be conceived, while Japan appreciates the fact that, in years of large Bristol Bay sockeye salmon runs, a substantial quantity of North American salmon can be caught by Japanese fishermen. The only new problem faced by the commission is the entry of South Korean fishermen into salmon fishing in Bristol Bay—a development which might undermine the whole setup of the North Pacific fisheries convention. As South Korea is not a party to the convention, the commission has not been able to take any action except to

express its concern over the matter, and the issue has been handled mainly through direct negotiations between the United States and South Korea. The Japanese government has taken some action to prevent the involvement of Japanese companies in the Korean venture. The amount of salmon taken by the Koreans is still relatively small, perhaps in the order of several hundred metric tons in 1970, but if Korean fishing continues even at this rate it will seriously affect the stability of the salmon situation in the eastern North Pacific.

Japan-Soviet Salmon Controversy

Japan planned to send, in 1956, as many as 19 salmon motherships to the northwestern Pacific, including the Okhotsk Sea. The Soviet government issued, in February 1956, a unilateral declaration to restrict salmon fishing in waters west of long 170°E. There had been indications that the Soviet government might take some action to stop the phenomenal expansion of the Japanese high seas salmon fisheries.¹⁸

The Soviet declaration included: establishment, as an interim measure before the conclusion of an appropriate international treaty, of a salmon regulatory area covering the eastern Bering Sea, the northwestern Pacific and the Okhotsk Sea (Figure 7) to restrict salmon fishing (by both Soviet and foreign nationals) during the period of spawning migrations; establishment of a catch limit for 1956 at 50,000 metric tons; issuance, by the Soviet authorities, of licenses for fishing in the area; enforcement of regulations by the Soviet authorities; and the assurance that freedom of navigation in the area would not be affected. The action taken by the Soviet government was obviously related to negotiations for the normalization of diplomatic relations which had come to a deadlock just before the Soviet declaration on fishing.

¹⁸ For example, at a meeting of the Economic Commission for Asia and the Far East (ECAFE) in 1955, the Soviet delegation pointed out that the salmon stocks in Kamchatka and other areas were in danger of being destroyed because of overfishing by Japan. Also, during negotiations for the normalization of diplomatic relations, which had been carried out in London, the Soviet representative stressed the need for restricting fishing for conservation of resources.

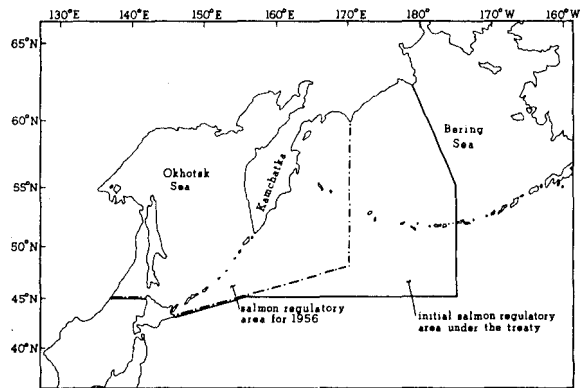


FIGURE 7.—Salmon regulatory area for the 1956 season and the initial salmon regulatory area under the 1956 treaty.

The Japanese government proposed immediate negotiations on fishery matters and sent to Moscow a team of top-notch experts headed by the Minister of Agriculture and Forestry. The convention, along with its protocol specifying regulatory measures and an agreement on emergency rescues, was signed on May 15. The treaty mentioned the maximum sustainable yield as the main objective, established the Japan-Soviet Fisheries Commission to consider joint conservation measures, set an annual salmon catch quota, and provided for enforcement of regulatory measures. The convention area was defined as the entire area of the northwest Pacific Ocean (excluding the territorial seas) including the Japan Sea, the Okhotsk Sea, and the Bering Sea. The protocol defined the regulatory area and spelled out regulatory measures to be taken for salmon, herring, and two species of king crab.

The convention provided that it would become effective upon entering into force of the peace treaty or the restoration of diplomatic relations. This undoubtedly speeded up peace negotiations, resulting in a joint declaration (to end the state of war and restore diplomatic relations) in December 1956. For all practical purposes, Japan's claim to the southernmost islands of the Kurile chain (which had been the main issue) was shelved. In order to permit Japanese salmon fishing for the 1956 season before the normalization of diplomatic relations, the two govern-

ments signed a temporary agreement which set a catch limit for that year. Japan undertook to reduce the size of the mothership fleet as a voluntary measure.

A lot of confusion occurred in connection with the procedure of obtaining licenses from the fishery inspection agency of the Soviet Ministry of Fisheries, but fishing did take place in the authorized areas in the Pacific and Okhotsk. Under the plan prepared before negotiations with the Soviet Union, 12 motherships with 375 catchers (including scouting boats) were to be sent to the northwestern Pacific and the western Aleutian waters, and 7 motherships with 213 catchers (including scouting boats) to the Okhotsk Sea. These were revised to 14 motherships with 447 catchers for the Pacific and Bering areas, and 2 motherships with 59 catchers for the Okhotsk Sea.

Since the regulatory area included part of the main fishing grounds of the land-based drift-net fishery, the total quota was divided into sub-quotas for the mothership fishery and the land-based fishery, each of which was further distributed among individual fishing vessels, establishing a precedent for an extremely detailed system of catch allocation. For the land-based drift-net fishery, quotas for individual vessels varied depending on their gross tonnage. The regulatory area under the temporary agreement did not cover vast areas to the east and south (Figure 7), and therefore a large amount (nearly one-half of the total take in 1956) was caught in waters outside. Due to delays in the issuance of licenses, the catch quota in the regulatory area was not filled within the established fishing period. The land-based longline salmon fishery, which began to develop in 1956, also took a considerable amount from waters outside the regulatory area.

The year 1957 was the first year of operation under the provisions of the convention. After hard negotiations both within and outside the fishery commission, the two governments settled for a total quota of 120,000 metric tons in the regulatory area, which now covered waters as far west as long 175°W but still excluded a substantial part of the land-based fishing grounds in the Pacific (see Figure 3 - Area A). The

quota was divided, under Japanese regulations, between the mothership fishery and the land-based drift-net fishery and further among individual fishing vessels. The land-based drift-net fishery made more than one-half of their catch in outside waters, and the land-based longline fishery took twice the amount it caught in 1956, all from outside waters. The combined catch of all high seas salmon fisheries was about 162,000 metric tons as compared with the catch limit of 120,000 metric tons for the regulatory area. The 1958 agreement reduced the total quota to 110,000 metric tons which was again divided between the mothership fishery and the land-based drift-net fishery. Fishing in the Okhotsk Sea was further restricted, and a large closed area was established in waters off the east coast of Kamchatka.

Annual negotiations for salmon regulations have resulted in further restrictions on Japanese fishing. In 1959, the entire Okhotsk Sea was closed to high seas salmon fishing, and additional closed areas were established on the Pacific side. The catch quota for the regulatory area was further reduced to 85,000 metric tons, and a catch limit was set for sockeye salmon. In 1960, the Soviet Union proposed a southward expansion of the regulatory area to control fishing by land-based vessels carried out in outside waters. The Japanese undertook to take some domestic measures. The quota for the regulatory area has been reduced to 67,500 tons, with additional closed areas. A new step was taken in 1962 by designating the waters south of the previous regulatory area as Regulatory Area B, with the Japanese government undertaking to limit the catch in Area B to about 60,000 metric tons (with a 10% allowance). By then, the catch quota in the original regulatory area (now Area A) had been reduced to 55,000 tons. The Japanese government took a drastic measure to reduce the number of vessels both in the mothership fishery and the land-based drift-net fishery. Drift-net fishing in the Japan Sea was also reduced substantially. In 1964, the quotas were further reduced to 55,000 tons each for both Area A and Area B. Table 5 shows how the salmon catch

TABLE 5.—Japanese salmon catches by different fisheries compared with the total Soviet salmon catches. Catches are in metric tons $\times 10^3$.

Year	Japanese salmon catches				Total	USSR total ¹
	Mothership	Land-based drift net	Land-based longline	Coastal traps and other fisheries		
1956	93	41	8	9	151	160.0
1957	100	53	15	12	182	148.0
1958	92	74	16	14	196	71.0
1959	71	84	15	9	179	94.8
1960	54	67	17	9	147	71.0
1961	54	75	16	12	156	82.2
1962	45	42	15	15	116	61.8
1963	46	61	24	17	149	81.1
1964	44	45	12	16	117	46.9
1965	45	59	22	19	146	89.8
1966	39	50	21	16	127	59.7
1967	43	57	28	20	148	84.1
1968	38	51	13	12	114	39.2
1969	40	55	27	19	141	78.3

¹ Total of sockeye, pink, chum, coho, and chinook salmon.
 Source of Japanese data: Ministry of Agriculture and Forestry (Japan) (1962-71).
 Source of Soviet data: FAO Yearbook of Fishery Statistics and Kasahara (1963).

has been shared by different fisheries since 1956¹⁰ (see Figure 3 for the fishing grounds of various fisheries). Although the details of changes in regulatory measures under the convention have not been mentioned, the above review clearly indicates that the Japanese high seas salmon fisheries have been subject to an increasing amount of control. The table also compares the Japanese catches (including small amounts of salmon destined for Japanese streams) with the Soviet catches.

Annual negotiations between the two governments both within and outside the commission have been very political, and in most cases important decisions have been made toward the end of each year's session as political compromises. From the data and information exchanged through the commission, it is difficult to evaluate the status of each of the important salmon stocks, particularly because the origin of much of the fish taken in offshore waters is not identifiable (except for such stocks as Karaginski pink salmon which to a large degree remain separate from others in their offshore distribution). The fact that the Japanese mothership fishery takes a large amount of Bristol Bay sockeye salmon in some years further complicates the situation.

The possibility of Korean fishermen conducting high seas salmon fishing in the Japan-Soviet

treaty area has posed a problem which is substantially different from the question of Korean entry in the eastern Pacific. The Soviet Union has unofficially indicated that, if that happened, any amount of salmon Korea might take would have to be subtracted from the quota for the Japanese fisheries. Korean salmon fishing has not developed as yet, perhaps for two reasons: First, lacking diplomatic relations with the Soviet Union, their fishing vessels might be seized and fishermen jailed by the Soviet authorities if the Soviet government should take a strong stand, and there would be no way of settling the problem through negotiations, nor would any of the nations bordering the North Pacific take a sympathetic attitude toward South Korea. Second, the Japanese government and industry might take retaliatory measures such as more severe restrictions on sea food import from Korea.

North Pacific Crab Controversies

International problems arising from king crab fishing after World War II are rather unique in several respects. Japan, the Soviet Union, and the United States have all been fishing for king crab, with Japan and the Soviet Union operating distant-water fisheries. While all three states fish for crab in the eastern Bering Sea, there has been no tripartite agreement dealing with crab fishing, international problems

¹⁰ A 2-year cycle due to pink salmon fluctuations is obvious. This has been taken into account when setting quotas.

being handled under three separate bilateral agreements, Japan-Soviet, United States-Japan, and United States-Soviet. Two of the three states, the Soviet Union and the United States, are parties to the 1958 continental shelf convention, which came into force in 1964, while Japan is not. The Soviet Union and Japan have developed a unique system to allocate tangle-net fishing grounds between their mothership fisheries both in Kamchatka and in the eastern Bering Sea.

As has been mentioned in the section on Review of Selected High Seas Fisheries, Japan planned to resume the mothership crab fishery during the 1952 season but did not proceed with the plan in fear of political repercussions from the United States. The fishery began in 1953 with one mothership jointly operated by the three biggest companies, each taking an equal share of interest and obligation, with a production quota of 50,000 cases (one case equals 48 cans of one-half pound each) set by the Japanese government, along with various restrictions on the fishing area and gear. This pattern of operation continued until 1956, when the production quota increased to 57,000 cases (plus some allowance). There were some U.S. crab vessels (trawlers) fishing in Bristol Bay from time to time, and arrangements were made for minimizing gear conflicts, but the U.S. catch was very small then. The rapid expansion of the Japanese crab fishery in Bristol Bay began in 1959, when the quota was raised to 70,000 cases. It was further increased to 80,000 cases in 1960, and in the same year a new mothership operation was authorized under an exploratory fishing license.²⁰ The Soviet crab fishery in Bristol Bay also started this year with one mothership. Thereafter expansion continued at an increasing rate.

By 1962, the fishery had grown to include three motherships in the spring season and two in the autumn. In 1963, the government consolidated the operations of different motherships and authorized only two, each managed jointly by several companies, with a total production quota of

²⁰ The catch was processed to frozen crab meat, with a production quota of 180 tons. Fishing was conducted with three deck-loaded boats and one independent boat.

235,000 cases (including frozen meat at a conversion rate of 100 tons of crab meat to 10,000 cases). The Soviet Union sent three motherships to the same area, resulting in some incidents of gear damage. During the period of expansion, the United States and Japan conducted research on the king crab stock in the eastern Bering Sea as part of the INPFC program, and the United States repeatedly expressed its concern over the condition of the stock.

In 1964, the United States enacted a law to prohibit exploitation of resources of its continental shelf by foreign nationals (the Convention on the Continental Shelf was ratified by the United States in 1961 and came into force in 1964). In a statement by the President, however, the United States indicated that due consideration would be given to the historical interest of Japan in king crab fishing in the eastern Bering Sea. Official negotiations were carried out during October-November 1964. As expected, Japan held the view that the king crab stock under question was a high seas resource, while the United States claimed the stock as a resource of the continental shelf over which the coastal state had exclusive jurisdiction. Although there was no agreement on the legal basis for regulating the exploitation of the stock, the two governments agreed to take certain measures for the seasons 1965 and 1966, including a reduction of the quota for the Japanese fisheries to 185,000 cases and various conservation measures applicable to the nationals of both nations. Fishing gear other than the tangle net and the pot was prohibited, and a large area was reserved exclusively for pot fishing.

A second round of negotiations was held in late 1966 and the agreement was extended, with the Japanese production quota further reduced to 163,000 cases for 1967-68. The agreement was revised again in 1968 for another 2 years, reducing the Japanese quota to 85,000 cases on the ground that the condition of the stock was deteriorating. For the first time, the need for paying attention to the condition of the tanner crab stock was discussed, and the Japanese government set a catch limit for tanner crab for the season 1969.

The U.S. government began negotiations with the Soviet Union for regulating crab fishing in the eastern Bering Sea. In this case, both governments were parties to the continental shelf convention and recognized the king crab stock as a resource of the U.S. continental shelf. An agreement was signed to limit the Soviet king crab production in the eastern Bering Sea to 118,600 cases for the seasons 1965 and 1966. The agreement has been revised from time to time since then, resulting in a continuous reduction of the Soviet quota, to 52,000 cases for 1969-70. The tanner crab catch was also limited to 40,000 cases per year for the same seasons.

The United States also suggested that there be a system of allocating tangle-net crab grounds between the Japanese and Soviet fleets, which would be similar to one implemented in Kamchatka for some time. Negotiations between the three governments were held in 1967, resulting in an arrangement shown in Figure 8. The agreement was renewed for 1969-70; the area reserved for pot fishing was expanded, and the remaining grounds for tangle-net were divided between the fleets of the two nations again. The allocated fishing strips have been rotated annually between the Soviet Union and Japan (there are many practical problems under this arrangement, including the use of fishing lots after the fleet of one nation has left).

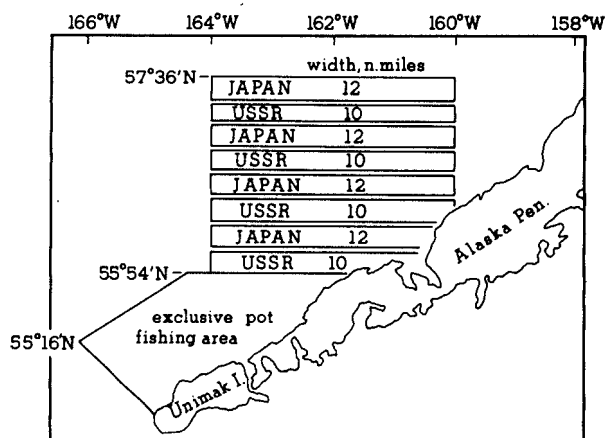


FIGURE 8.—Allocation of king crab fishing grounds in the eastern Bering Sea, 1969 (from Suisan-sha, 1970).

In short, a system of allocation has been developed between the three nations for crab fishing in the Bering Sea. Japanese fishing has been subject to catch limits under a United State-Japan agreement, which is legally not based on the continental shelf convention; Soviet fishing has been subject to catch limits under a Soviet-United States agreement which is based on the continental shelf convention; U.S. fishing has not been subject to catch limits; the Japanese and the Soviet quotas have been reduced, while the U.S. catch has increased rapidly in the last few years; a large area has been allocated exclusively for pot fishing; the tangle-net fishing area has been divided between the Japanese and Soviet fleets and rotated annually; size limits and other conservation measures have been applied to all nations. These arrangements have been made through executive agreements, and not by treaties requiring ratification.

On the Asian side, Japanese crab fishing in waters off the west coast of Kamchatka was resumed in 1956. The government authorized two motherships, each operated jointly by two companies, with a production quota of 60,000 cases each (plus 5% allowance), which was increased to 70,000 during the fishing season. Four motherships operated in 1956, with a production quota of 70,000 cases each (plus allowance). The actual production reached 313,000 cases.²¹ The Japan-Soviet fishery convention, which entered into force in late 1956, included regulatory measures for two species of king crab (*P. camtschatica* and *P. platypus*), but the Japan-Soviet fisheries commission did not restrict fishing effort or the catch during the season 1957. At the annual meeting of the commission in 1958, the Soviet Union stressed the need to restrict crab fishing, and each government undertook to take certain measures (not as commission's decisions but as actions by each government), including a limitation on the number of motherships (no more than four Japanese motherships for 1958-60 and six Soviet motherships for 1958) and production quotas (no more than 320,000 cases per

²¹ The government also authorized one mothership to operate in the Olyutorski area, but the fleet could not reach its production quota. The unfilled portion of the quota was taken by one of the four motherships operating in west Kamchatka.

year by Japan for 1958-60 and 480,000 cases by the Soviet Union for 1958). The commission recommended to close waters south of lat 53°N, and the Soviet government undertook to take a similar measure for fishing within its territorial sea. The national quotas for mothership fisheries were further reduced in 1959 to 280,000 cases for Japan and 420,000 cases for the Soviet Union. Various other measures also took effect to restrict fishing and avoid conflicts. Further changes were made thereafter to increase the proportion of the Soviet share in the total mothership catch and to reallocate fishing grounds between the fleets of the two nations (Figure 9), with the Soviet Union taking somewhat wider strips.

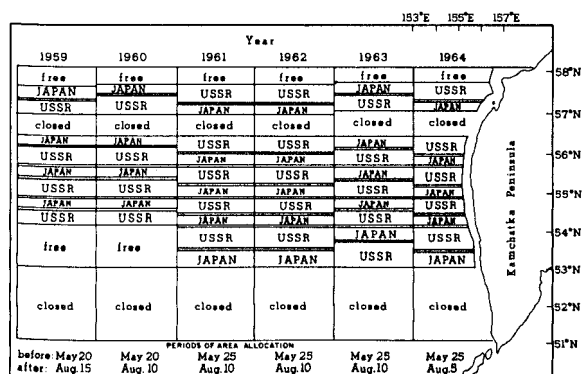


FIGURE 9.—Allocation of king crab fishing grounds off west Kamchatka, 1957-64 (from Norin Keizai Kenkyusho, 1965).

A new situation developed in 1968 when the Soviet government declared sovereign rights to the resources of the continental shelf and wished to enter into negotiations in 1969 for a separate agreement for crab fishing. As in the case of United States-Japan negotiations, Japan refused to recognize the Soviet claim not only on the ground that Japan was not a party to the continental shelf convention (the Soviet ratified the continental shelf convention in 1960) but also for the reason that she did not consider the crab a continental shelf resource. The fact that Japan is not a party to the convention might not have been considered a strong enough reason

for arguing against the Soviet claim since the convention had been ratified by most of the major fishing nations. After prolonged negotiations, an agreement (in the form of an exchange of letters, along with a protocol and agreed minutes) was reached by shelving the positions of the two governments on legal questions.

Thus, the numbers of vessels (motherships or land-based vessels) were limited and the catch quotas (in terms of either canned crab produced or the number of crabs caught) established for *P. camtschatica* in west Kamchatka; "ibara crab" (a deepwater crab, *Lithodes aequispina*) in west Kamchatka; tanner crab in the western Bering Sea (off the Gulf of Anadyr and waters between Cape Olyutorskiy and Cape Govena); tanner crab, *P. camtschatica*, and *P. platypus* ("abura crab") in waters off the east coast of Sakhalin; hair crab (*Erimacrus*) and *P. brevipes* ("hanasaki crab") in waters around the southernmost islands of the Kurile chain (Figure 10).²² Fishing grounds for all these fisheries were specified, and closed seasons, size limits, and various other restrictions applied. The Japanese government issued a new set of domestic regulations to cover these fisheries. Quotas for most areas were further reduced in 1970.

Fur Seal Convention

As mentioned above, Japan undertook, during the occupation period, to voluntarily prohibit her nationals or vessels from carrying on pelagic fur sealing, pending the conclusion of a new convention. Negotiations for a new convention took a number of years, and the convention signed in 1957 (came into force the same year) was called an Interim Convention for the Conservation of North Pacific Fur Seals. Although it is

²² Japan had developed a substantial mothership fishery for *P. platypus* in waters along the coast of Olyutorskiy. This fishery was terminated by the 1969 crab agreement on the ground that the stock had been depleted. The remaining part of the crab fishery in that region was mainly for tanner crab in waters east of Cape Navarin and west of Cape Olyutorskiy conducted by motherships and land-based vessels. Japanese tanner crab fishing in waters off the west coast of Sakhalin and Primore (the Soviet mainland coast of the Japan Sea) was also terminated with the fishing vessels transferred to the tanner crab grounds along the east coast of Sakhalin.

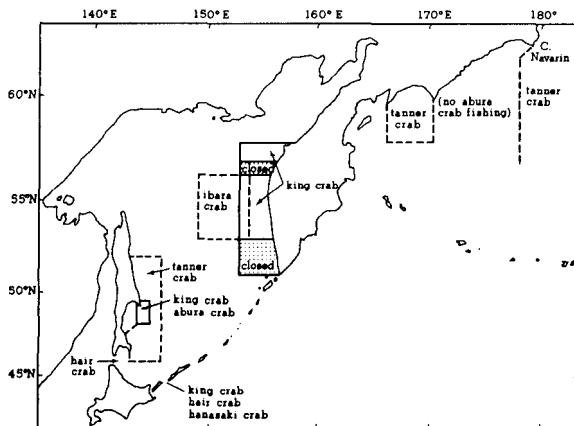


FIGURE 10.—Crab fishing regulated under the Japan-USSR crab agreement, 1969 (from Suisan-sha, 1970).

still called an interim convention, it is almost a permanent arrangement. Pelagic sealing is prohibited; a system of product distribution more or less similar to that under the 1911 convention is in effect. While the previous convention carried out its tasks without forming an international body, the new one established an international commission. Much emphasis has been placed on a research program to arrive at an optimum level of harvesting and examine the effects of seal predation on other fishery resources.

Rhee Line

Perhaps the most difficult fishery controversy Japan has ever faced is the Rhee Line issue arising from a declaration by President Syngman Rhee of the Republic of Korea concerning marine sovereignty. Korea had ceased to be a Japanese colony at the end of the war, and negotiations for normalizing relations between the Republic of Korea (South Korea) and Japan began in February 1952 and continued until June 1965, for a period of 13 years. The most difficult of all the problems was the fishery dispute. The seizure of Japanese fishing vessels by Korean authorities for alleged violation of waters under Korean jurisdiction started as early as 1947, immediately after the postwar expansion of Japanese fisheries began, and incidents increased

greatly in the following few years. On January 18, 1952, President Syngman Rhee issued a declaration claiming sovereign rights to all natural resources over a vast area delimited by the so-called Rhee Line (Figure 11).²³ On September 8, 1953, the Korean government further issued a statement ordering all Japanese fishing vessels to stay outside the line, and enforced the order strictly at the height of the Japanese mack-

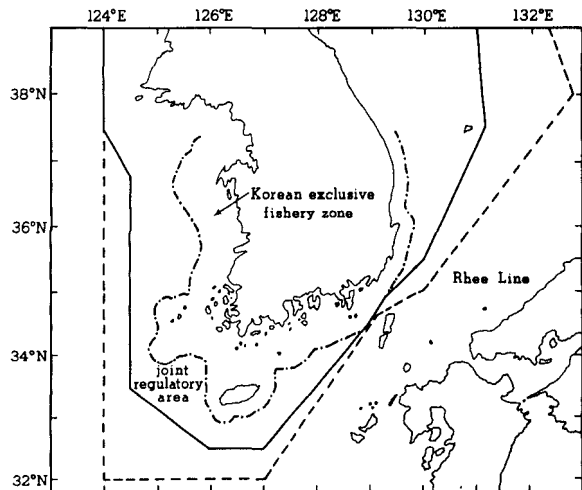


FIGURE 11.—Korean exclusive fishery zone and the joint regulatory area under the Japan-Korea fishery agreement (from Fishery Agency, 1965). Large portions of the joint regulatory area are closed to trawl fishing.

erel fishing season. Four major Japanese fisheries were affected: the pole-and-line mackerel fishery (with lights), the purse-seine fishery for jack mackerel, the trawl fishery west of long 130°E, and, least important, the trawl fishery east of long 130°E. Between 1947 and 1959, 326 Japanese fishing vessels were seized and the bulk of the 3,900 fishermen involved were jailed (of these, 141 vessels and practically all fishermen were returned later). The Japanese government did not contest the Korean claim by force but merely tried to minimize the number of incidents by running her patrol boats along the Rhee Line.

²³ The preamble of the declaration referred to established international precedents, and the Truman proclamations of 1945 were mentioned in this connection.

Among the issues taken up during negotiations for the normalization of diplomatic relations, the treatment of property claims and the conclusion of a fishery agreement were most difficult, and the fishery dispute perhaps created far more problems than the claim issue, for it affected the operations of thousands of Japanese vessels. (Among the other main agenda items were the establishment of basic relations between Japan and the Republic of Korea, the laying of submarine cables, and the conclusion of a treaty concerning trade and navigation.) The final settlement reached in June 1965 included four agreements, of which one on property claims and economic cooperation and one on fisheries were the most important from a practical point of view. The former specified the forms and amounts of monetary compensations. Japan undertook to provide \$300 million (360 yen per dollar) as grants, \$200 million as government loans (at 3.5% with a repayment period of 20 years including 7 years of grace),²⁴ and more than \$300 million of commercial credit at a low interest rate. A substantial portion of the total sum was expected to be spent for fishery development, mainly in the form of vessels and equipment.²⁵

The agreement between Japan and the Republic of Korea concerning fisheries consisted of the mutual recognition of a right to establish a 12-mile fishery zone over which the respective coastal state would have exclusive fishery jurisdiction, and the establishment of a joint regulatory area in which fishing by the nationals of both nations was to be restricted as to the numbers, sizes, and types of fishing vessels as well as the annual catches of the fisheries concerned. Closed areas, closed seasons, and other restrictions were also applied. The Korean exclusive fishery jurisdiction zone and the joint regulatory area established under the agreement are shown in Figure 11. Japan established a 12-mile fishery zone along the coast facing Korea. Arrangements under the agreement, its protocol,

²⁴ Loans may be used for both capital goods and material.

²⁵ The Korean government originally envisaged investing roughly \$150 million in fishery development, but actual items to be provided by Japan have been negotiated annually.

and subsequent agreements are extremely complex.

The effects of the fishery agreement have been quite remarkable. Disputes over fishing activities have ended almost completely.²⁶ No major controversies have developed from the annual meetings of the Japan-Korea fisheries commission established under the agreement. During the period of negotiations, the Korean fishing industry had grown to a strong competitive industry which no longer needs much legal protection against Japanese fishing activities. It is obvious that, on a give-and-take basis, Korea gained much more than she gave up in the overall settlement, which to a large extent depended on the resolution of fishery disputes. The fishery agreement and its protocol also indicate how far the Japanese government might go in making complicated arrangements to settle international fishery problems.

Conflicts with People's Republic of China

After the outbreak of the Korean War, Japan began to have serious problems with the People's Republic of China.²⁷ During 1951-54, more than 150 vessels, practically all pair trawlers, were seized in the East China Sea by the Chinese patrol vessels (Norin Keizai Kenkyusho, 1965). Negotiations began in 1954 between a Japanese nongovernmental organization and a Chinese fishery association, resulting in a 1-year agreement on the operation of the trawl fishery in the East China Sea (including the Yellow Sea). The coastal areas were closed to trawl fishing, and the numbers of Japanese and Chinese trawl vessels to operate in certain areas during certain periods were limited. The agreement was extended for another 2 years but was terminated by China in 1958, resulting in another outbreak of incidents. A separate agreement was made in 1959 concerning emergency port calls by

²⁶ Most of the fishery problems since the conclusion of the treaty agreement have been in connection with the export of Korean fishery products to Japan, particularly dry laver, the only export market of which is Japan who also has a very large laver aquaculture industry.

²⁷ Although Japan was not involved in the war, she provided bases close to Korea and was also an important source of war supplies.

fishing vessels (each side designated three ports for emergency calls). Negotiations for another fishery agreement began in 1963, and the previous agreement was revived with certain modifications for another 2 years. The agreement has since been revised and modified from time to time. Under the agreement signed in June 1970, the Japanese delegation agreed to enter into negotiations with a view to restricting purse-seine fishing. A new agreement was signed in December 1970 establishing three regulatory areas for purse seining: one is closed and the numbers of Japanese and Chinese seiners are limited in the remaining two.

Although these agreements have helped reduce the number of incidents greatly, their non-governmental status made it difficult for Japan to enforce the agreed regulatory measures, and many violations have occurred. The important stocks of groundfish in the East China Sea are generally in poor condition due to overexploitation. There is no way of developing an overall international agreement to protect and allocate these resources, for diplomatic relations do not exist among some of the countries exploiting the same stocks. China has taken the greatest proportion of the total landings, although no reliable estimate is available. Japan's catch has been substantial, while the proportions taken by South Korea, North Korea, and Taiwan have been relatively small.

Extension of Limits of National Jurisdiction

Japan has been dealing with an increasing number of problems arising from the extension of the limits of national jurisdiction through unilateral claims by coastal states. As a general trend is for more nations to claim broader zones, a review of Japan's responses to these claims is appropriate.

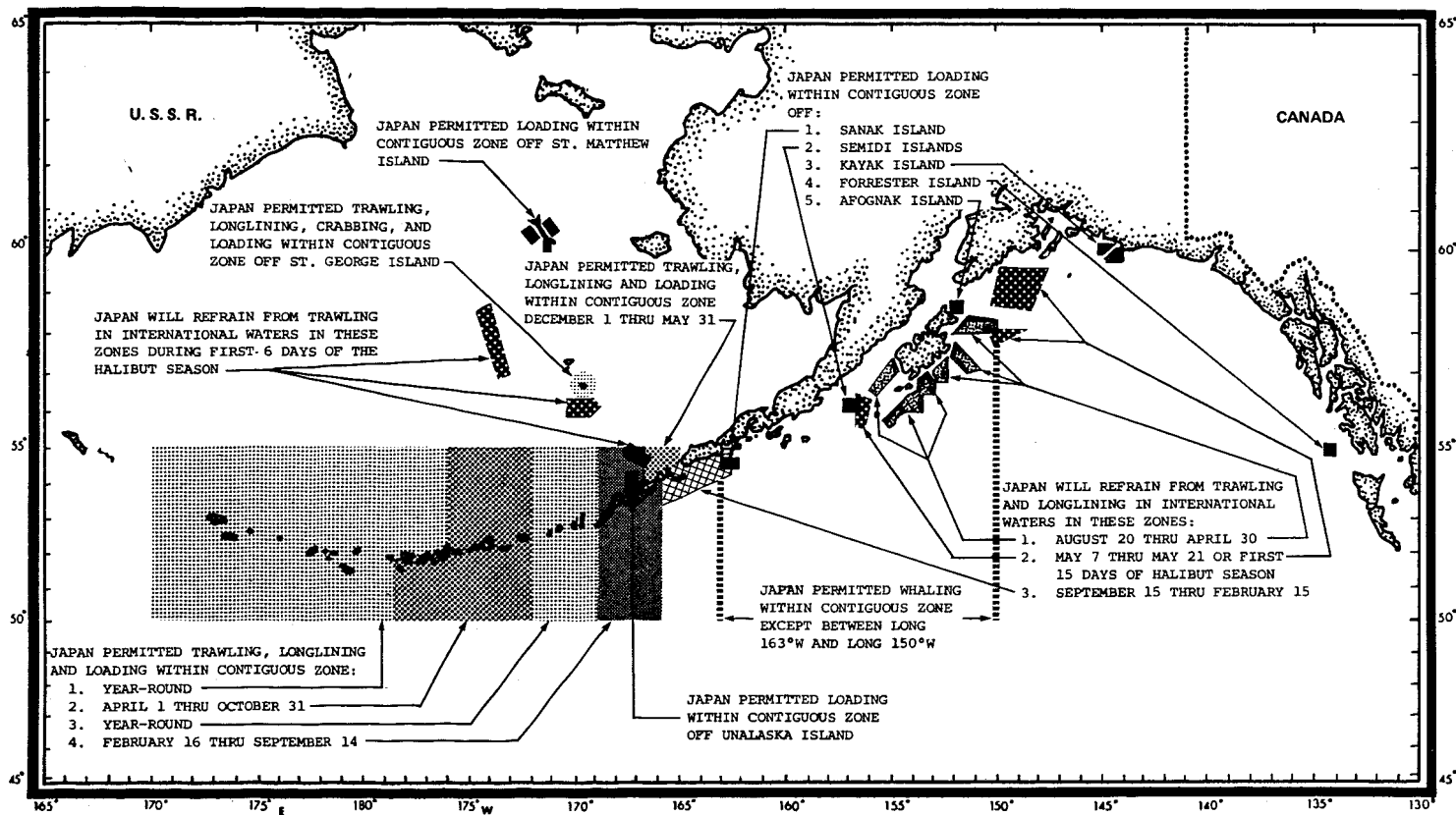
United States.—Except for the abstention provisions of the North Pacific fisheries treaty, the Japan-United States crab agreement, and regulatory measures recommended by INPFC for Bering Sea halibut, Japanese fisheries in the eastern half of the Pacific Ocean have been relatively free of restrictions. The Japanese gov-

ernment initially controlled the expansion of groundfish fishing into waters south of the Alaskan Peninsula on the basis of unofficial discussions with the United States, but the situation changed in 1965 when the government issued regular licenses to a substantial number of vessels.

Negotiations for resolving problems arising from the establishment of an exclusive fishery jurisdiction zone by the United States in 1966 (3-12 miles) began in January 1967, and an agreement came into effect in May 1967. While the United States took the position that an exclusive fishery zone could be established by a domestic law, Japan held the view that such a zone had no legal basis without an international agreement. As in the case of the crab dispute, the governments shelved their legal positions and worked out practical arrangements.

The agreement covered a wide variety of fishing activities, both within and outside the fishery zone. For example, Japan was permitted to continue the established fisheries within the fishery zone for crabs off the Pribilof Islands, groundfish along the Aleutians except during certain periods in certain areas, whales along the Aleutians and the Gulf of Alaska except between long 150°W and 163°W, salmon off the Aleutian Islands west of long 175°W, and tunas except in waters around the Hawaiian Islands and off the mainland coast. Certain areas within the zone were also designated for loading and support activities. In turn, Japan undertook to refrain from fishing in certain areas of international waters during the first part of the halibut season and during the main crab pot fishing season. The agreement has since been revised twice, the most recent revision (effective January 1971) being summarized in Figures 12 and 13. (In comparison, the United States-Soviet agreement is summarized in Figures 14 and 15.)

It is obvious that the United States has tried, with some success, to reduce the effects of foreign fishing in international waters on important domestic fisheries in turn for allowing foreign fishermen to continue their fishing in areas within the exclusive fishery zone where such fishing does not seriously affect domestic fisheries. The United States has also avoided con-



Prepared March 1971
National Marine Fisheries Service
Juneau, Alaska

FIGURE 12.—Arrangements under the United States-Japan fishery agreement (December 1970) concerning the U.S. contiguous fishery zone, off Alaska (taken from Commercial Fisheries Review, 1971a).

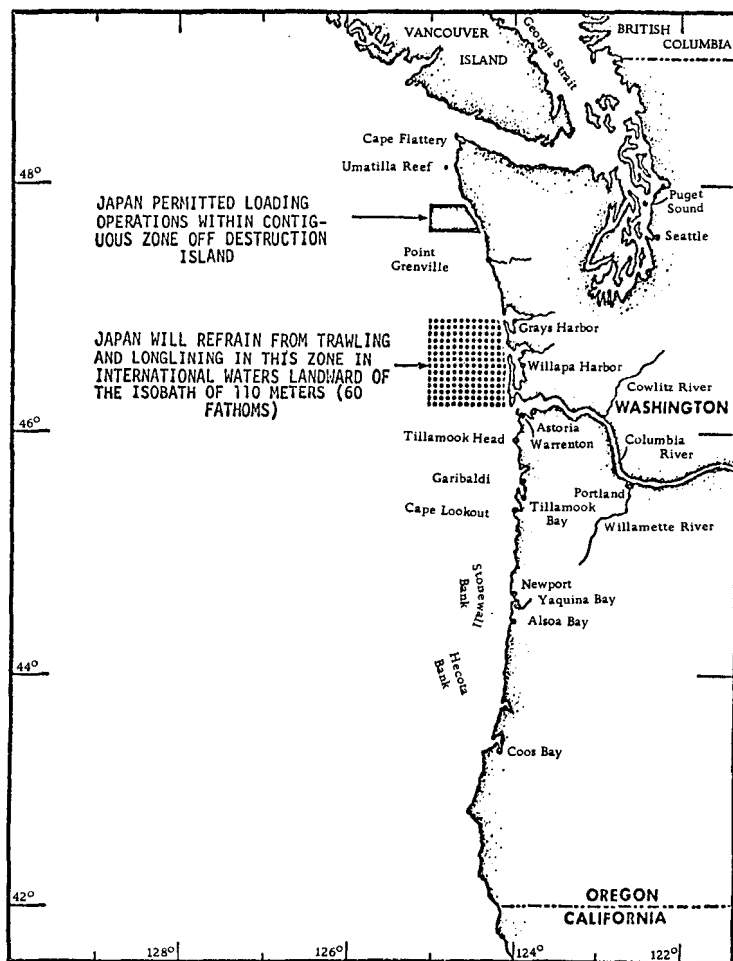


FIGURE 13.—Arrangements under the United States-Japan fisheries agreement (December 1970), off the Pacific Northwest (taken from Commercial Fisheries Review, 1971a).

cluding a long-term agreement which might affect her position with respect to global negotiations now being held.

Mexico.—When Mexico declared, in 1967, a 3-mile exclusive fishery zone beyond her 9-mile territorial sea, Japan entered into negotiations with Mexico to protect her vested interest in tuna longline fishing in waters between 9 and 12 miles. There was no agreement on the legality of the Mexican claim, but practical arrangements were worked out so that, except in areas particularly important to sport fishing, Japan was able to continue longline fishing in waters between 9 and 12 miles without exceeding the amount of effort in the previous years. The agreement was

in the form of an international treaty effective over a period of 5 years. This was a relatively minor dispute.

New Zealand.—New Zealand declared a 9-mile exclusive fishery zone beyond her 3-mile territorial sea in 1966. Japan entered into negotiations with New Zealand to protect her longline porgy (“tai”) fishery within the newly claimed area. The agreement reached in 1967 allowed Japanese fishing to continue in waters between 6 and 12 miles without increasing the number of vessels, nor their size, until the end of 1970 (for 5 years after the establishment of the exclusive

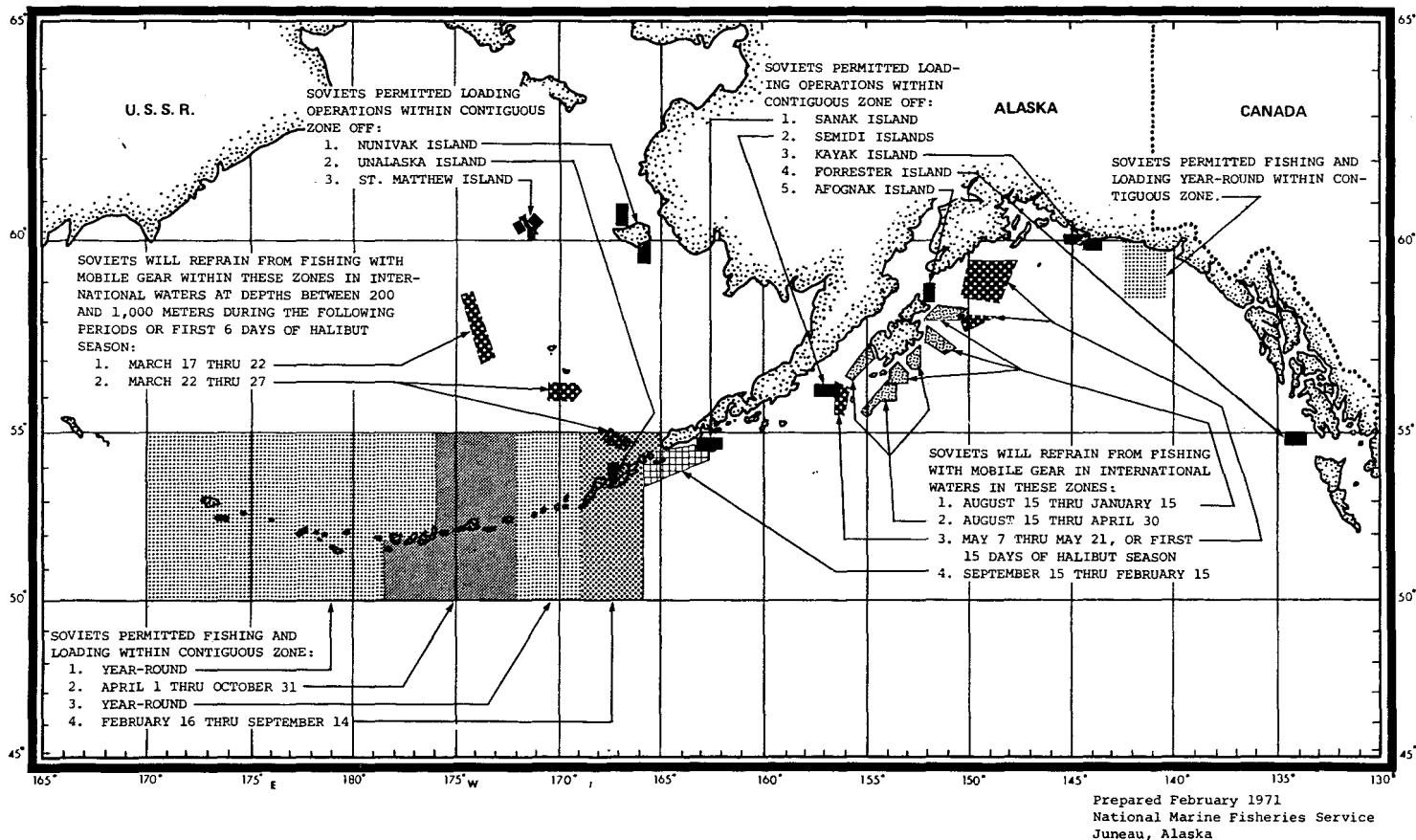


FIGURE 14.—Arrangements under the United States-USSR fisheries agreement (February 1971), off Alaska (taken from Commercial Fisheries Review, 1971b).

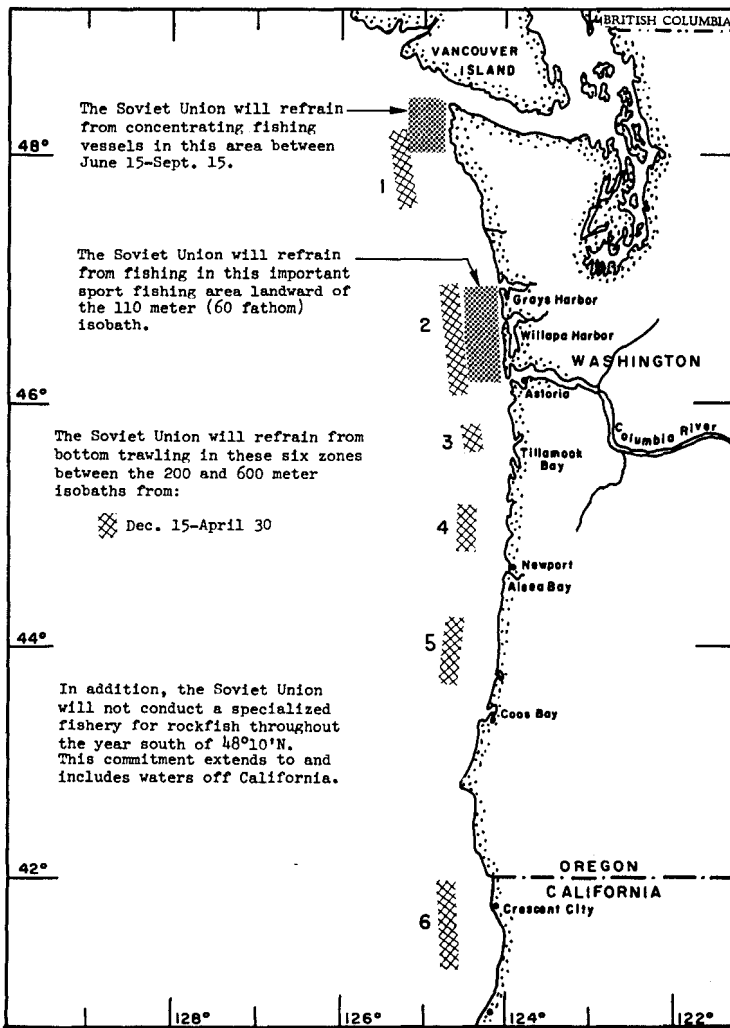


FIGURE 15.—Arrangements under the United States-USSR fisheries agreement (February 1971), off the Pacific Northwest (taken from Commercial Fisheries Review, 1971b).

fishery zone in January 1966). Japanese fishing within the zone terminated at the end of this period.

Australia.—Australia declared, in 1968, a 9-mile exclusive fishery zone beyond her 3-mile territorial sea (including Territory of Papua), and at the same time indicated that Australian ports would in principle be closed to foreign fishing vessels. The Japanese tuna longline fishery, mainly for southern bluefin, would be affected, especially by the closure of ports. Tuna vessels would have to pay license fees to fish in the ex-

clusive fishery zone. Negotiations took over 3 months. As usual, the question of legality of the claim was shelved, but the agreement reached envisaged the phasing out of Japanese fishing in 7 years. Australia designated four ports for Japanese tuna vessels to visit, each paying a small fee.

Indonesia.—In 1957, Indonesia claimed all waters within her archipelago as internal waters and started seizing Japanese tuna boats, particularly in the Banda Sea, which was an important tuna fishing area for smaller longliners. An

agreement was concluded, in 1968, between the Japanese industry (represented by the Federation of Japan Tuna Fishery Co-operatives and the National Federation of Fishery Co-operatives) and the Indonesian Ministry of Agriculture. The number of vessels to operate in the Banda and Ceram Seas was limited for each of the three size categories (most of the vessels being less than 70 gross tons) with a maximum total number of 250 vessels and an annual quota of 15,000 metric tons. Each vessel was to pay a sum of money for using Ambon as a supply base. A substantial amount of technical assistance was also to be provided by Japan in connection with the agreement. The agreement was for a period of 1 year, but has been renewed every year with minor changes.

West Africa.—The Japanese trawl fishery along the coast of West Africa has been facing increasing difficulties due to the extension of the territorial sea and other unilateral claims by the coastal states (see Table 6 for present status). Fishing in the northern area, along the coast of Spanish Sahara and Mauritania for cuttlefish, octopus, and porgies, has been affected seriously by the establishment of an exclusive fishery zone (6-12 miles) by Spain and the extension of the territorial sea by Mauritania. In

TABLE 6.—Territorial seas and exclusive fishing zones claimed by West African countries as of April 1971. Distances are in nautical miles and year of enactment is in parentheses.

Countries	Territorial sea	Outer limit of exclusive fishing zone
Morocco		12 (1967)
Spanish territories	6 (1957)	12 (1967)
Mauritania	12 (1967)	
Senegal	12 (1967)	18 (1968)
Gambia	12 (1969)	
Portuguese territories		12 (1966)
Guinea	130 (1964)	
Sierra Leone	12 (1965)	
Liberia	12	
Ivory Coast	6 (1967)	12 (1967)
Ghana	12 (1963)	¹
Togo	12 (1964)	
Dahomey	12 (1965)	
Nigeria	12 (1967)	
Gabon	25 (1970)	
Congo (Brazzaville)	12 (1969)	
Congo (Kinshasa)	No legislation	
South Africa	6 (1963)	12 (1963)

¹ A 100-mile conservation zone (1963). Source: FAO (1971).

the case of Mauritania, an extensive straight base line measuring some 90 nautical miles was used along the northern part of its coast. Both governments enforced these measures and seized some Japanese vessels.

While Spain has not agreed to negotiate with Japan on fishery problems arising from her action, Mauritania did. After a long period of negotiation, a 1-year agreement was signed in February 1970 (came into effect in April 1970) which might be extended for another year with the consent of both parties. It provided for 24 Japanese trawlers to operate within the 12-mile zone, plus 5 small vessels within 3 miles of the coast. The latter vessels would deliver their entire catch to Mauritania, which would then be sold to Japan. Each of the 24 trawlers would provide training for three Mauritanian fishermen, and each of the five small vessels for one fisherman. Japan also undertook to purchase fish taken by local Mauritanian fishermen. Although Japan would pay a certain sum (approximately \$28 per gross ton of each vessel per year), Japan did not want to have it called "a fishing fee." As far as Japan was concerned, the money would be paid as a form of aid or economic cooperation in exchange for permission for Japanese vessels to fish within the zone and to use Mauritanian port facilities. The Japanese delegation for negotiation was composed mainly of industry representatives.²⁸

Participation in International Fishery Conventions

Japan has recently joined four multilateral fishery conventions: the Northwest Atlantic fisheries convention (joined 1970), the Inter-American tropical tuna convention (joined 1970), the Atlantic tuna convention (came into force 1969), and the Southeast Atlantic fisheries convention (came into force 1971). Thus, Japan is now a member of the following fisheries commissions established under international conventions: the International Whaling Commis-

²⁸ The legal status of this agreement is not clear to the author. Mauritania has also concluded bilateral fishery agreements with such other nations as Greece, Italy, Spain, and the Netherlands.

sion, the North Pacific Fur Seal Commission, the International North Pacific Fisheries Commission, Japan-Soviet Fisheries Commission, the Japan-Republic of Korea Joint Fisheries Commission, the International Commission for the Northwest Atlantic Fisheries, the Inter-American Tropical Tuna Commission, the International Commission for the Conservation of Atlantic Tunas, and the International Commission for the Southeast Atlantic Fisheries now in the process of being established. As mentioned, above, Japan is a party to a large number of bilateral agreements, including some nongovernmental arrangements, with a variety of nations. Consultations have also been taking place annually between the tuna industries of the three major longline fishing nations: Japan, Taiwan, and South Korea.

FORMS OF INTERNATIONAL ARRANGEMENTS AND MEANS TO IMPLEMENT THEM

Forms of Arrangements

The official position of the Japanese government concerning high seas fishing has always been for the basic freedom of fishing and, where conservation measures are required, free competition between nations within the limitations equally applicable to all. She has always supported a narrow territorial limit; she is still not a party to the 1958 continental shelf convention, nor the 1958 convention on fishing and conservation of living resources. In practice, however, she has accepted various forms of allocation as means to accommodate the conflicting interests of the nations concerned, although she has seldom taken the initiative for making such arrangements.

The most extreme form of resource allocation is, of course, "abstention," which Japan accepted, though under unusual circumstance. In most other cases, the allocation of resources has been implemented through a combination of catch quotas, often with a system of allocating fishing grounds, and direct control on fishing effort. This applies to all salmon and crab fisheries (and now herring fishing) under the Japan-Soviet fishery agreements, the crab fishery

under the Japan-United States agreement, the fisheries regulated under the Japan-Korea fishery treaty, whaling in the Antarctic as well as in the North Pacific, and many other cases. The principle of product distribution is also practiced under the fur seal treaty. In most cases, a total quota is applied to fishing in a specific high seas area and/or for a specific resource. To control fishing effort, the types and numbers of vessels allowed to operate in the area are restricted. The total quota is usually divided between operating units, such as mothership fleets or independent vessels. The available fishing grounds, too, are often allocated between different sectors of the fishery. Such usual measures as closed seasons, closed areas, size limits, gear restrictions, etc. are applied. In the case of king crab, the international tangle-net fishing grounds are divided into a number of small fishing lots which are allocated and regularly exchanged between the Soviet and Japanese fleets (see Figures 8 and 9).

Japanese responses to what she considers unilateral actions have also been rather pragmatic. For example, Japan is not a party to the continental shelf convention, while the United States and the Soviet Union are. Yet, arrangements made under the Japan-United States crab agreement and United States-Soviet crab agreement are in principle the same. Japan claims a 3-mile territorial limit, while the Soviet Union claims a 12-mile limit. But Japan has never attempted to fish within 12 miles of the Soviet coast, except around the southernmost islands of the Kurile chain. The treatment of problems arising from the establishment of an exclusive fishery zone by the United States is not substantially different between the United States-Japan fishing agreement and the United States-Soviet fishing agreement (see Figures 12-15). On a global basis, different arrangements have been made to resolve fishery problems arising from the establishment of an exclusive fishery zone. The United States-Japan fishing agreement mentioned above is on a give-and-take basis. Under the Japan-Mexico fishing agreement, Japan managed to continue tuna fishing in much of the waters concerned. In both the Japan-Australia agreement and the Japan-New Zealand agree-

ment, Japan agreed to phase out her fishing activities in the respective zones within a relatively short period of time (5 years for New Zealand and 7 years for Australia). Different forms of compensation and payment have been used, e.g., the Japan-Korea agreement, the Japan-Indonesia agreement, and the Japan-Mauritania agreement, sometimes on a large scale. Political trade offs are not unusual either. Japanese pragmatism has gone to the extent of concluding nongovernmental agreements to settle fishery problems, as seen in negotiations with the People's Republic of China and Indonesia.

In the entire history of international fisheries disputes after World War II, Japan has never contested unilateral jurisdictional claims by force. Even at the height of the Japan-Korea dispute, when a large number of Japanese vessels were being captured by Korean patrol boats, Japanese patrol boats never opened fire or tried to recapture the vessels by other means. Japan has not challenged the 200-mile territorial sea or fishing limit claimed by Latin American nations except by protests through diplomatic channels. In short, despite her rigid position regarding the freedom of fishing and limits of national jurisdiction, Japan has in practice accepted various forms of allocation, including the allocation of resources, division of catch, allocation of fishing grounds, as well as a system of revenue sharing in exchange for giving up the right to exploit a resource on the high seas (fur seal). She has done so in most cases reluctantly and after long, hard negotiations.

Means to Control Fisheries to Meet International Problems

Japan has so far found some way of settling almost every major international fishery dispute, as well as extremely complicated problems of domestic fisheries, some of which were mentioned in connection with the development of trawl fisheries in Japan. This is not an easy task, if one considers the diversity of fishing and processing activities and the enormous amount of investment in every sector of the industry. What has made it possible for the Japanese government to cope with all these conflicts from various sources is the existence of an effective, central-

ized system of control as briefly described in the introduction of this paper. The so-called licensing system applies to practically all offshore fisheries. Although legal authority is vested in the Minister of Agriculture and Forestry, the Fishery Agency, which is subordinate to the Ministry, has in fact full power to control all major fisheries. Thus, the central government may, and does in practically all cases, restrict the type, number, and often size of the vessels allowed to operate in a given area and/or for a given resource. Although objectives are different from case to case and change from time to time, the basic concept is to give the central government a strong means to allocate resources among different sectors of the industry to accommodate their conflicting interests. The administration of fisheries under this system is naturally subject to pressures from different groups, including large fishing companies, vessel-owner associations, and fishermen's associations, but institutional changes are made only through this centrally controlled system. The system is also used, in most cases rather effectively, to accommodate such changes as the government and industry consider necessary for meeting new international developments or resolving international fishery issues. It is, of course, debatable whether this system has in the long run facilitated the rational development of the Japanese industry, for there is no way of telling how the industry would have developed under any other system. Japan can not go back to 1946 and start developing fisheries again.

Another important factor which has contributed toward facilitating international fishery arrangements is the existence of well-organized associations representing various segments of the industry. As briefly described by Kasahara (1964), the structure of the Japanese fishing industry is one of extreme complexity. There still exist a huge number of small fishing craft, including many nonpowered vessels, while large companies operate gigantic motherships and factoryships. Between these two extremes, there are vast numbers of vessels of all kinds and sizes. The existence of the large fishing companies running most of the important distant-water fisheries deserves special attention. The following

brief description of the biggest four indicates the magnitude of large company operations (data are mostly for 1968 and do not include their subsidiary companies):

Taiyo Gyogyo Company, Ltd.

In addition to fishing, fish processing, and marketing, engaged in a wide variety of other activities.

Gross sales	\$472 million.
Number of employees	10,890 including 6,880 aboard ships.
Number of vessels	486, with a combined gross tonnage of 225,000.
Major fishing activities	Whaling, the mothership salmon fishery, the mothership trawl fishery, trawl fisheries in distant waters (including the Bering Sea and northeast Pacific) and the East China Sea, overseas shrimp ventures, and others.

Nippon Suisan Company Ltd.

In addition to fishing and fish processing, a substantial interest in transport business, with four large vessels carrying oil and ore.

Gross sales	\$195 million.
Number of employees	7,950 including 3,960 aboard ships.
Number of vessels	131, with a combined gross tonnage of 396,000.
Major fishing activities	Whaling, trawl fisheries in distant waters (including the Bering Sea and northeast Pacific) and the East China Sea, the mothership trawl fishery, the mothership salmon fishery, the mothership crab fishery, overseas shrimp ventures, and others.

Nichiro Gyogyo Company, Ltd.

Before the war, the company monopolized Japanese salmon fishing from the Russian territory. Now engaged in diversified activities.

Gross sales	\$155 million.
Number of employees	5,800 including 3,190 aboard ships.
Number of vessels	113, with a combined gross tonnage of 98,000.
Major fishing activities	The mothership salmon fishery, the mothership crab fishery, the mothership trawl fishery, trawl fisheries in distant waters (including the Bering Sea and

northeast Pacific), overseas shrimp ventures, tuna fisheries, and others.

Kyokuyo Hogeï Company, Ltd.

Started as a whaling company but has since diversified its activities.

Gross sales	\$85 million.
Number of employees	3,640 including 1,810 aboard ships.
Number of vessels	48, with a combined gross tonnage of 100,000.
Major fishing activities	Whaling, the mothership salmon fishery, trawl fisheries in distant waters (including the Bering Sea and northeast Pacific), overseas shrimp ventures, the tuna longline fishery, crab fishing, and others.

Among these four companies, they own practically the entire whaling business excepting minor operations by two small companies, 8 out of 11 salmon motherships,²⁹ roughly two-thirds of the crab fisheries in the eastern Bering Sea, three-quarters of the mothership crab fishery in west Kamchatka, some 80% of the Bering Sea mothership trawl fishery, most of the large stern trawlers operating in the North Pacific, West Africa, and other distant waters, as well as much of the shrimp ventures abroad. It means that the government can handle the industry aspects of most of the international problems concerning these fisheries by communicating with these and a few other companies (some of them subsidiaries of the big ones). The government sometimes has forced them to conduct joint operations. Thus, one of the two mothership crab fleets fishing in the eastern Bering Sea is managed jointly by four companies, the other by five companies. Representatives of these companies, particularly the first three, often participate in international negotiations.

The structure of fishery trade associations in Japan is rather complicated. The following is a brief description of some of the associations concerned with international aspects of Japanese fisheries:

²⁹ Salmon catcher boats are largely owned by small companies and individual vessel owners.

Japan Fishery Association (Daisui) generally represents the interest of larger fishing companies engaged in offshore and distant-water fisheries. It is often represented in important international fishery negotiations. It develops industry policies on international fishery problems and also deals with specific disputes. It also arranges for long-term, low-interest loans for the development of distant-water fisheries. The present chairman of the association is one of the most experienced Japanese in international fishery negotiations.

National Federation of Fishery Co-operatives (Zengyoren) provides nationwide representation for Japanese fishery co-operatives. Two of the main areas of activity are the procurement and distribution of duty-free diesel oil and fish marketing, but the federation is involved in international fishery negotiations from time to time.

Federation of Japan Tuna Fishery Co-operatives (Nikkatsuren) is the most powerful association for Japanese tuna fisheries, participated in by tuna and skipjack vessel owners through their local cooperatives,³⁰ and is involved in most of the international negotiations concerning tuna fisheries. Together with Zengyoren, the federation signed the Banda Sea agreement with Indonesia. The federation is making an effort to restrengthen the Japanese tuna longline fishery with substantial success. It buys in when the market is weak. It has been campaigning for increased domestic consumption of the tuna species that have been mainly exported, resulting in an appreciable increase in the consumption of canned albacore tuna. It has promoted consultations with the tuna industries of South Korea and Taiwan. It plans to institute voluntary restrictions, mainly closed seasons, on fishing for southern bluefin tuna (in effect as of October 1971). It compiles the most complete statistics of the longline fishery available in Japan.

³⁰ Tuna operators not eligible to cooperative membership under the Japanese fishery cooperative law, mainly companies operating large tuna boats, are organized under the Japan Tuna Fishery Association (Nikkatsukyokai). Nikkatsuren and Nikkatsukyokai always work together.

Federation of Japan Salmon Fishery Co-operatives (Nikkeiren) represents salmon catcher boat owners and is mainly concerned with catch quotas for the mothership salmon fishery and negotiations with mothership owners for profit sharing (formerly for selling prices). There are also associations representing such other salmon fisheries as the land-based drift-net fishery and the land-based longline fishery.

National Federation of Medium Trawlers represents bottom trawl fisheries in waters east of long 130°E, including the category called "Hokutensen" (see page 233). As the importance of "Hokutensen" increases, the association is now concerned about the condition of the pollack stocks in the northern areas (Kamchatka, North Kuriles, and Bering Sea) on which the entire fishery is based.

Japan Trawler Fishery Association represents trawl fisheries (largely by pair trawlers) in the China Sea. They have been concerned with problems with South Korea and the People's Republic of China.

Japan Deep-sea Trawlers Association represents companies operating large distant-water trawlers, and has been active in negotiations with Mauritania (Chairman of the association served as the Japanese chief delegate). It has made arrangements for exploratory trawl fishing for new grounds, and has engaged in planning the production of pollack minced meat ("surimi").

Except the first two mentioned in the above list, these associations represent the interests of specific fisheries and provide a convenient means of communication between the government and industry in connection with international negotiations involving such fisheries.

IMPACT OF JAPANESE FISHING

The expansion of the Japanese and Soviet fisheries has caused more international fishery problems than any other single factor. To be fair, some credit should be given to these two nations for their contribution towards development of new fishery resources all over the world. Japan and the Soviet Union, for example, have developed new resources in the Bering Sea and

adjacent areas which now support an annual combined yield of perhaps 3 million metric tons and which would have remained unexploited or grossly underexploited without their effort. Japan has developed the tuna resources of the world ocean exploitable by longline. Again along with the Soviet Union, Japan initiated large-scale exploitation of groundfish resources along the west coast of Africa. The Soviet Union has been most active in developing new resources in the northwest Atlantic area. Japan has developed other resources, though not as great as those mentioned above, in various parts of the world.

On the international scene, however, Japan has seldom been given credit for her contribution towards resource development, for the impact of Japanese distant-waters fisheries on the resources in international waters, some of which are also utilized by coastal states, was such that many nations look upon Japanese fishing, along with Soviet fishing, as one of the major factors responsible for the depletion of fishery resources on a global basis. There are many obvious cases in which Japan should be blamed for overexploitation of the resources that were either utilized by other states at the same time or were considered important potential resources for them. Japan and the Soviet Union are largely responsible for the present state of the Antarctic whale stocks; Japan obviously overexploited many of the important stocks in the East China Sea; she overfished the yellowfin sole stock in the eastern Bering Sea, which was also an important resource for the Soviet Union; the impact of offshore salmon fishing on the Soviet salmon stocks is apparent, although no critical assessment has been carried out; many of the crab stocks in the Bering Sea and Kamchatka have been overexploited to varying degrees; some of the stocks of porgies (sparids) in West Africa have been overfished by the trawl fisheries of Japan and some other nations.

In other instances, Japanese fishing has not had any substantial effect on the fisheries of the coastal states concerned, as is the case with the pollack fishery in the Bering Sea, much of the tuna and skipjack fishing, deepwater trawling, fishing for cuttlefish and octopus in northwest Africa, herring fishing in the eastern Bering Sea,

squid fishing off New York, etc. But even in those cases, the way new resources have been developed by the Japanese looks frightening to many other nations. A new resource may be exploited to a maximum level within several years, sometimes in 2 or 3 years. Emphasis shifts from one resource to another, or from area to area. The way Japanese trawl fisheries in the Bering Sea and adjacent areas are being expanded mainly based on one species, pollack, makes biologists wonder how long the resource can support the fisheries and what would happen if the pollack stock collapsed suddenly.

This new pattern of fishing, characterized by concentration of effort through large fleet operations and shift of emphasis from one resource to another, may not necessarily be a bad strategy from the point of view of maintaining the total production and the profitability of the industry. But it is not acceptable to many other nations because it is contradictory to the established principles of management based on the concept of maximum sustainable yield and, more important, because such a pattern of fishing can be adopted only by nations having well-organized distant-water fisheries. If a nation is unable to participate in the utilization of a resource for technological or economic reasons, she would rather keep it undeveloped than see some other nation exploit it.

There is little doubt that the development of Japanese and Soviet distant-water fisheries has had very appreciable effects on the international fishery regimes. The impact of these fisheries, whether real or imaginary, has been one of the major factors motivating unilateral jurisdictional claims by coastal states. This applies, for example, to actions taken by the United States, Canada, South Korea, some of the Latin American nations, many of the West African states, and even some of the Southeast Asian nations. Even the Soviet Union has taken unilateral actions to protect its fisheries against Japanese high seas activities. In addition to these events, the expansion of Japanese and Soviet fisheries has been at least partially responsible for a worldwide trend for coastal states to justify various forms of jurisdictional control as effective means to deal with international fishery prob-

lems. Whether or not the Law of the Sea Conference can produce a general agreement on this matter, some principle to the above effect is likely to emerge as a consensus of the majority. Exactly to what extent the development of distant-water fisheries has contributed to this general trend is difficult to assess. It should also be pointed out that some of the European nations, particularly the east European, have followed the example of Soviet fishery development, though on a smaller scale, and have accelerated the trend for extension of coastal jurisdiction.

FUTURE PROBLEMS

CHANGES IN REGIMES FOR FISHERIES

The purpose of this section is to make predictions, based on past performance, on how the Japanese government and industry might respond to possible changes in international regimes for marine living resources.

First, a brief analysis of the changes in international regimes that are most likely to take place appears appropriate (Kasahara, in press). The first preparatory meeting of the Law of the Sea Conference (scheduled for 1973), held in March 1971, made it clear that fishery problems were among the most controversial issues concerning uses of the ocean. One of the reasons for this is the fact that fisheries are important to many of the developing countries, which comprise the overwhelming majority of United Nations membership. Another factor, which may be more important, is the very nature of fishery problems. It is perhaps useful to note how well some of the major uses of the sea have been served by the existing regimes based largely on the traditional concept of free access. These include transportation, which is the most important use of the sea, communication, scientific research, and recreation. Even the exploitation of mineral resources has not caused insolvable international conflicts. Although developing nations might look upon such freedoms as inequitable because of their limited participation, little real damage has been done in those aspects of use of the sea. The major exceptions to this

general notion are fishing and pollution. Except for pollution from sea accidents, most of marine pollution originates in areas within the limits of national jurisdiction rather than beyond. This leaves fishing as the most controversial issue.

Free access to fishing on the high seas may have served for increasing food production from the sea, but it has resulted in numerous international conflicts and necessitated almost continuous negotiations between nations all over the world. Most of the actions taken to extend national jurisdiction in one form or another have been motivated by a desire to control use of living resources. Fishery interests have also created such new concepts as an exclusive fishery zone, preferential rights of coastal states, as well as the allocation of resources in international waters.

Judging from the nature of recent fishery conflicts and discussions in the United Nations system, one of the predominant trends will obviously be further extension of coastal jurisdiction over the exploitation of living resources. Such a trend will continue regardless of the outcome of the Law of the Sea Conference. Extension of coastal jurisdiction might take the form of broader territorial zones, or preferential rights of coastal states. National claims might also be expanded through a new definition of living resources subject to the existing continental shelf convention and/or a new sea-bed treaty now under consideration. It is also possible that some nations might translate the new regime for sea-bed resources into a regime for the control of living resources in superjacent waters.

There is no question that most of the developed nations would prefer a relatively narrow territorial sea as a general rule from the point of view of minimizing potential hazards to important nonextractive uses of the sea, particularly shipping and navigation. The probability of coastal states taking unilateral actions to restrict the right of passage for nonmilitary purposes is rather remote, since practically all nations are beneficiaries of this right, and such actions would result in retaliatory measures of various kinds. Nevertheless, under certain circumstances, some nations might possibly take such actions for economic gains. However small

the probability might be, the stake is big enough for a substantial number of nations to try to block a proposal for a territorial sea wider than 12 miles, or, failing this, to refuse to sign any treaty containing such a provision. Thus, chances are slim for an *effective* global treaty specifying a territorial sea broader than 12 miles to come out of the proposed 1973 conference. This will not, of course, prevent some nations from extending their territorial seas through unilateral claims. If any effective global agreement on fishery matters should come out of this conference, however, it would be based on the principle of separating out the question of jurisdiction over fisheries from the total package of national jurisdictions comprising sovereignty.

The conference may not result in an overall agreement on fishery issues, but it is quite likely that there will be a general recognition of special rights of coastal states in terms of exclusive fishery jurisdiction or other forms of preferential allocation of resources. Such a principle will be supported not only by developing nations but also many of the developed nations.

One way of protecting fishery interests of coastal states beyond the territorial sea would be the recognition of exclusive fishery jurisdiction within a certain zone, perhaps defined in terms of a fixed distance and/or a depth. It would be up to the particular coastal state whether it chooses to allow foreign fishermen to fish within the zone under conditions set by the coastal state. Some coastal states might prefer to allow foreign fishing for the resources that are not utilized or grossly underexploited by their own fishermen, probably charging foreign vessels a substantial fee. Arrangements might also be made for such resources to be developed from coastal bases as a condition for allowing foreign fishing.

Another way of protecting the interests of coastal states would be for coastal fisheries to be given preferential rights (including a right to adopt and implement conservation measures which would be binding on foreign vessels) to all resources within a certain zone beyond the territorial limit. This would involve problems of determining what portions of such resources or catches therefrom should be allocated to the

coastal fisheries concerned, including the question of whether the coastal state should have a right to control the exploitation of the resources that are not used by them to any substantial degree. Under this principle, the formula to be adopted would perhaps vary from case to case. Preferential fishing rights might also be applied to specific resources important to the coastal states without establishing a fixed zone. This would involve such additional questions as the determination of major areas of distribution of the resources concerned, and the effect of foreign fishing for other resources on the particular resources in the same area.

Among the three alternatives mentioned above, more nations might favor the first to ensure a greater degree of control and simplicity of implementation. The main question in this case would be how the zone should be defined. Some of the nations supporting this idea may still be thinking in terms of a distance of 12 nautical miles from the shore for their exclusive fishery zone, with a narrower territorial sea. Some others are apparently considering varying distances to meet the specific situations. A substantial number of nations seem to favor much greater distance, up to 200 miles, and/or to the outer edge of the continental shelf.

A small number of nations might prefer preferential fishing rights for specific resources that are important to their coastal fisheries. This would be a rather complex concept and a variety of problems would arise from its implementation. Many different formulae could be considered. The existing arrangement for yellowfin tuna in the eastern tropical Pacific may fall in this general category in that allowance is made, within the total catch limit, for vessels of smaller carrying capacities. Various bilateral fishery agreements between the United States and nations operating distant-water fisheries off her coast also include provisions for reducing the adverse effects, on coastal fisheries, of foreign fishing on the high seas. The treatment of anadromous fishes, particularly salmon, and marine mammals returning to land for breeding might also be considered a special case in this general category. Different formulae are in practice to handle such a case. For North American salmon, the absten-

tion principle prohibits fishing by Japan in the eastern half of the North Pacific and Bering Sea. Catches of Asian salmon, on the other hand, have been shared by the Soviet Union and Japan. A system of product distribution has been applied to the harvesting of North Pacific fur seals.

Along with the general trend of extension of coastal jurisdiction, there will also be a continuing trend for more bilateral and multilateral fishery agreements between the nations directly concerned. International agreements solely for conservation, that is, for the purpose of maximizing the total catch, have become less and less attractive to most nations, and emphasis has shifted to arrangements combining systems of allocation with conservation measures. The question of national quotas, particularly for the heavily exploited stocks, will undoubtedly become one of the most critical issues of fishery negotiations in the future. National quota systems are now being discussed even by some of the international commissions which originally did not envisage them, as is the case with the Inter-American Tropical Tuna Commission or the International Commission for the Northwest Atlantic Fisheries. There is no established set of principles as to how the allowable total catch from a stock or stocks should be divided among the nations exploiting such a stock or stocks in waters beyond the limits of national jurisdiction, nor as to what allowance should be made for new entry.

It is not very likely that the Law of the Sea Conference would come up with any specific formula to divide the limited catch. It is possible, however, that discussions at the conference might result in the general acceptance of the establishment of national quotas as a principle of international regulation of fisheries without spelling out details to implement it (such details would be left to bilateral or multilateral agreements between the countries concerned).

In any case, changes likely to take place in the regimes for regulation of fisheries, with a predominant trend for extension of national jurisdiction by coastal states, may result in more international negotiations rather than less. In many parts of the world, such as Southeast Asia, the Gulf of Mexico and the Caribbean, the South

Pacific Islands, West Africa, or even in much of Europe, the question of determining the boundaries between areas of national jurisdiction of neighboring states would become enormously complicated and, in some cases, might never be solved. Negotiations for the handling of historical rights of noncoastal states, as well as of neighboring coastal states, in the extended area of national jurisdiction of each state, would also take time. In many regions, regional arrangements of various kinds would have to be negotiated among neighboring coastal states to accommodate each other's fishing activity. Without such arrangements, the development of the fisheries of coastal states would be hampered greatly, and the proper management of stocks of fish crossing several national boundaries would become impossible. In the present political environment, I doubt that the countries concerned could agree to a single regional convention for each region. In most areas, a complex network of bilateral and semiregional agreements would develop. The enforcement of these arrangements would also be difficult and costly.

POSSIBLE RESPONSE

The question of how Japan might respond to likely changes in international regimes for fisheries is, to a substantial degree, answered by what she has done in the past in response to various claims by other nations (see section on International Arrangements). If the Law of the Sea Conference results in a global convention providing for extensive coastal jurisdiction or broad preferential rights of coastal states, it is unlikely that Japan will be a party to such a convention. She would then regard actions taken by member states of the convention as unilateral. In the past, Japan has responded to unilateral actions in a variety of ways. When she did not have much vested interest in the zone claimed and the nation claiming the zone was not prepared for negotiating the issue, Japan voluntarily refrained from fishing in the zone while refusing to recognize the claim. When her vested interest was very substantial, Japan entered into negotiations with the country concerned. In some cases, such as the Japan-South

Korea controversy, the Japanese government did not stop fishing vessels of its nationals from entering the claimed zone, resulting in the seizure of many vessels. In most cases, however, practical arrangements of various kinds were agreed upon, sometimes after long negotiations, as described before. Japan has not challenged any fishery claim by force, and, except for the Japan-South Korea and Japan-Soviet controversies, no real diplomatic crisis has developed from fishery issues.

The future trend in this respect will be about the same. Japan would do her best to protect her fishery interest against unilateral claims with whatever trade offs available to her, both within and outside the purview of fisheries, but would still seek a pragmatic solution to settle the issue. If Japan has no vested interest in the area claimed, she might voluntarily refrain from entering the zone for fishing while officially refusing to recognize the claim. The same would perhaps apply to Japan's reaction to claims based on the concept of preferential rights of coastal states.

Such concepts as the allocation of resources, the division of catches therefrom, or the distribution of benefits, have already been applied extensively to fishery arrangements involving Japan. Although Japan would not recognize these as internationally accepted legal concepts, she would not object to practical arrangements which would have the same effects. The application of a limited entry system has never been a problem to Japan because of the very nature of her domestic regulations, as outlined in the introduction of this paper. In most of the bilateral agreements she has made so far, the number (and in many cases the size as well) of the vessels to operate in a designated area is limited.

Any substantial change in the definition of shelf resources to include more living resources currently exploited would not be recognized by Japan officially. The main reason for Japan not to sign the 1958 continental shelf convention was the inclusion of living resources. The pattern of bilateral negotiations for problems that might arise from this source would be about the same as that for problems from extended fishery jur-

isdiction. She would do her best to protect the vested interest of her fishing industry.

The possibility of general recognition of a special right to anadromous species, particularly salmon, would be a matter of great concern to Japan, as high seas salmon fishing is still one of the most important sectors of the Japanese fishing industry. During the Law of the Sea Conference, the establishment of a special right to anadromous species may be proposed by some nations as one of the principles of international regulation of fisheries. This might receive rather broad support, not only because of problems of Pacific salmon but also in view of recent developments in offshore salmon fishing in the Atlantic. Again, Japan would not join a convention including such a provision. But if the United States, Canada, and the Soviet Union should claim, on the basis of such a convention, a special right to anadromous species for the main purpose of eventually eliminating high seas salmon fishing, Japan would be in a difficult position to protect her interest in salmon fishing.

The idea of establishing a world agency for regulating all high seas fisheries has been talked about by idealistic people, but by now it is widely recognized that this is not feasible, nor even desirable. We can pretty well eliminate this possibility from our consideration of fishery problems in the foreseeable future.

In short, it is unlikely that Japan could take any definite course of action to cope with an increasing number of international problems she is going to face. She must be prepared for more and harder negotiations to find a practical solution to each of the problems. In the North Pacific, Japan will have to keep negotiating with the Soviet Union for salmon, crabs, and herring, and probably for some of the groundfishes in the future. Negotiations have become increasingly difficult as additional regulatory measures have been proposed by the Soviet Union every year. As the U.S. king crab fishery in the Bering Sea is expanding with the Japanese quota being reduced, the future of the Bering Sea king crab fishery also looks bad. Continuous pressure will come from the United States and Canada to provide their coastal fisheries with a

greater amount of protection against Japanese fishing for groundfishes and shrimp. Pollack, the main species for the trawl fisheries in the Bering Sea and Kamchatka waters, might become a serious international problem in the near future. Japanese fishing pressure is still mounting; the Soviet catch is increasing; South Korea is building a number of stern trawlers in Japan with a view to rapidly increasing her participation in pollack fishing. The Japanese trawl fishery along the west coast of Africa will face further international problems as more African nations take measures to extend fishery jurisdiction. Most of the bilateral agreements Japan has concluded in recent years are of short duration, and it may be difficult to continue these on the same terms.

The Japanese tuna industry might still be able to compete with the Taiwanese and Korean fisheries by taking advantage of rapidly expanding domestic markets, but a substantial increase in the catch of the longline fishery is not likely. Major efforts are being made to develop a purse-seine fishery similar to that of the United States and to increase the production of skipjack, which is at present an underexploited resource; but international regulations will gradually be applied to many of the tuna fisheries. In the eastern tropical Pacific, the present pattern of tuna fishing is likely to lead to a system of national quotas. Tuna fisheries in the Atlantic will also be subject to some international regulatory system in the future. Eventually there might be a regime of worldwide regulation covering all major tuna fisheries. Trawl fishing in the Northwest Atlantic will also be subject to further restrictions through bilateral and multilateral arrangements. Whaling both in the Antarctic and the North Pacific will have to be further curtailed.

International fishery problems faced by the Soviet Union are not too different from those confronting Japan, except in the Northwest Pacific where the Soviet Union finds herself in the position of a coastal nation seeking protection against Japanese fisheries. It is interesting to note that their responses to unilateral claims have not been too different from those of Japan.

FUTURE OF THE INDUSTRY

The phenomenal growth of the Japanese economy has greatly increased demand for high-quality foods, particularly animal protein products. The per capita consumption of animal protein increased by 19% in the 5-fiscal year period of 1963-68. About 58% of the animal protein intake is still from seafoods, including whale meat. During the same period, the per capita expenditure for fishery products increased by 10% per annum in cities and 13.2% per annum in rural areas (Anonymous, 1969). Markets have also developed for a greater variety of fishery products. Imbalance between demand and supply has been increasing constantly, pushing up prices sharply. Pressure for increased fish supply is still quite strong in Japan.

Domestic Production

What alternatives are available for Japan to meet this problem? First, let us examine the possibilities of increasing the domestic supply of fish. Figure 16 indicates the trend for production by four sectors of the Japanese marine fishing industry. Divisions between the sectors, except aquaculture, are somewhat arbitrary.

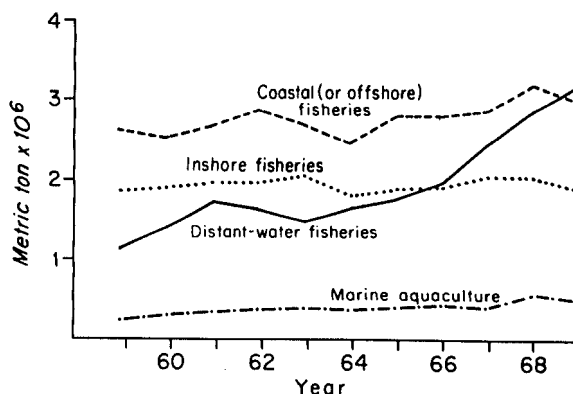


FIGURE 16.—Production of four sectors of the Japanese fishing industry 1959-69 (from Ministry of Agriculture and Forestry, 1971). Division between inshore fisheries and coastal (or offshore) fisheries is somewhat arbitrary. Distant-water fisheries include trawl fisheries in the China Sea.

The total production of inshore fisheries has stayed about the same for the last 10 years, a little less than 2 million metric tons. The total catch of coastal fisheries (called "offshore fisheries" in Japan) has shown a substantial increase, but has been influenced by fluctuations of a few pelagic species. (Mackerels and common squid, for example, account for a sharp increase in 1968.) Distant-water fisheries have contributed greatly to a general increase in production during the last 10 years, but pollack account for the largest portion of the growth. In fact, many of the other distant-water fisheries have shown a decline in the most recent years. Pollack are largely processed into minced meat and fish meal. The domestic production of fish meal has also increased rapidly during the same period.³¹ Fish meal is manufactured on factoryships, now mainly from pollack, as well as on land, from mackerel, some other coastal pelagic species, and pollack.

Inshore fisheries.—This sector consists of fishing by small vessels (particularly dragnets), coastal traps, beach seines, and other miscellaneous methods including collection of bivalves and seaweeds. Virtually all stocks in inshore waters are exploited very intensively, and no increase in production would be possible by further intensifying fishing efforts. Theoretically it might be possible to improve the fisheries in this category by introducing better management measures, but it would create enormous social and economic problems. The fisheries are tightly controlled by the long-established fishing right system largely operating through cooperatives.

This sector of the industry has always presented difficult social problems due to low productivity (efficient fishing methods are usually outlawed) and overemployment. Unlike farmers around urban areas, who have become rich by selling their land for industrial or residential use, these fishermen have nothing to cash in. Social problems of small fishing communities

³¹ As in most other industrialized countries, demand for fish meal as animal feeds has risen sharply and has been met mainly by domestic supply and partly by imports. Domestic producers have been protected by an import quota.

along the Japanese coast will only be solved gradually by young people being absorbed in manufacturing industries. The industrialization and urbanization of the coastal zone is becoming a real threat to inshore fisheries, particularly those in bays and estuaries. Inshore fisheries are still important in Japan for providing consumers with fresh, high-priced seafoods, but the possibility of increasing their total production has to be written off.

Coastal (or offshore) fisheries.—This category includes all fisheries carried out by medium-sized vessels. They include Danish seining, pair trawling, purse seining, saury fishing, tuna long-lining by smaller vessels, salmon fishing by smaller vessels, skipjack fishing by smaller vessels, pole-and-line fishing for mackerel, squid fishing, and others. Some of these fisheries are conducted in fairly distant waters, for example, tuna and skipjack fishing or offshore saury fishing. Except in the last 2 years, this sector has produced the greatest proportion of the total catch of the entire Japanese fishing industry.

While the catches of groundfishes around the Japanese islands have been relatively stable, under very strong fishing pressure, the catches of coastal pelagic species have fluctuated greatly as outlined in Other Fisheries, pages 243 to 245. All of these species have been exploited very intensively. Although Japanese scientists do not agree on the causes of the declining catches of some of these species, particularly sardines (*Sardinops*) and saury, overfishing is a strong possibility. The causes of a rapid increase in jack mackerel during the late 1950's and early 1960's and in mackerels (mainly *Scomber japonicus*) in the late 1960's are also unknown. This sector of the industry will continue to face large fluctuations in the catches of major pelagic species, but a long-term increase of the total catch is unlikely. The total production of major coastal pelagic species, including mackerels, jack mackerel, anchovy, saury, sardines (now very insignificant), and squids during 1956-69 is shown in Figure 17. (The figure includes catches by inshore fisheries.) The introduction of better methods of resource manage-

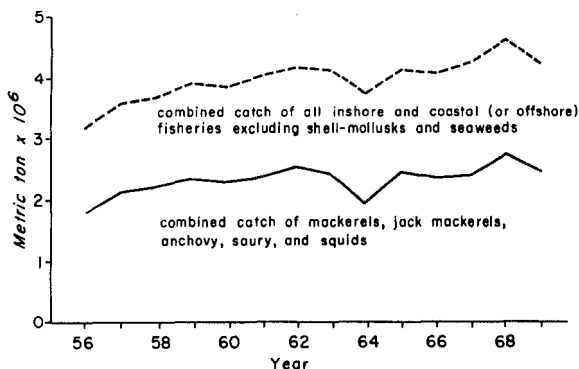


FIGURE 17.—Combined catch of mackerels, jack mackerels (including *Decapterus*), anchovy, saury, and squids, 1956-69 (from Ministry of Agriculture and Forestry, 1971).

ment does not appear practical at the moment, because of the complexity of regulations under the licensing system and the lack of understanding of the causes of sharp decreases or rapid increases in the abundance and catch of coastal pelagic species.

In the long run, however, this is one area in which substantial improvements in efficiency, and possibly in total production, might be possible largely by reducing fishing effort. This applies to both demersal species and coastal pelagic species. This would require major political decisions, with great social and economic implications. Such a process would take many years in any case.

Distant-water fisheries.—Although the total production of distant-water fisheries has increased very sharply, the catches of many fisheries in this category have actually been on the decline in recent years, due to international regulation, decreases in abundance of many stocks, and increasing competition with other countries. The total catch of the mothership salmon fishery in the Northwest Pacific has decreased from 71,000 metric tons to 40,000 tons in the last 10 years. (That of the land-based salmon gill-net fishery has decreased from 85,000 tons to 55,000 tons in the same period.) The king crab catch by the mothership crab fishery has declined from 15,000 tons in 1964 to a little over 9,000 tons in

1969. The loss has been compensated by a sudden increase in the tanner crab catch in the last 3 years. The combined catch of all home-based tuna longliners has declined from the peak of 386,000 tons (including nontuna species, such as billfishes, swordfish, and sharks) in 1962 to 317,000 tons in 1969, and that of foreign-based operations (in the South Pacific, Indian Ocean, and Atlantic) from 118,000 tons in 1965 to only 28,000 tons in 1970. The catch of the mothership tuna fishery (with deck-loaded catchers) has also decreased, from 68,000 tons in 1964 to 38,000 tons in 1969. The long-established pair-trawl fishery in the China Seas has been at about the same level for the last 10 years, with a slight decline in the most recent years. The total catch of the trawl fisheries in the Atlantic increased rapidly until 1967 and has stayed at about the same level since then.

The sharp increase in the total catch of distant-water fisheries, shown in Figure 16, is accounted for mainly by the expansion of the trawl fisheries in the northern North Pacific. The catch of the mothership trawl fishery has increased from 169,000 metric tons in 1959 to 862,000 tons in 1969. The catch of independent trawlers increased from 2,000 tons to 373,000 tons in the same period, and that of "Hokutensen" from nothing to 768,000 tons. The mothership trawl fishery in the Bering Sea first depended mainly on yellowfin sole, but emphasis shifted to other species, particularly pollack, when the flounder stock in the eastern Bering Sea declined sharply.

Since the introduction of minced meat ("surimi"), the proportions of pollack in the catches of these trawl fisheries have jumped up. As of 1969, 678,000 tons out of 862,000 tons caught by the mothership trawl fishery were pollack. Corresponding figures for independent trawlers were 200,000 tons out of 373,000 tons (they take substantial quantities of ocean perch in the Aleutian and the Gulf of Alaska). Those for Hokutensen were 670,000 tons out of 768,000 tons. The total catch of pollack by distant-water fisheries has risen from 33,000 tons in 1959 to 1.55 million tons in 1969. The corresponding figures for the coastal fisheries are 343,000 tons and

396,000 tons. The pollack catch is still increasing; several 5,000-ton class vessels, newly built, are coming into operation. The recovery rate of minced meat from pollack is relatively small, probably between 20 and 25%, and the remainder goes to fish meal and oil. But the price of pollack surimi, used for making fish cakes ("kamaboko," "chikuwa") and other products, is so high that it makes all the difference in the profitability of the trawl fisheries in the northern areas. The price of fish meal is also high, around \$200 per ton. Although imports of fish meal are scheduled to be liberalized this year, a high import duty will be levied when imports exceed a certain quantity still to be fixed.

Search for new distant-water fishing grounds continues, and there have been some developments in this area, such as deepwater trawling around the mid-Pacific islands, squid fishing off the Atlantic coast of the United States, trawling in the Gulf of Aden for sea breams and cuttlefish, or fishing for barracouta (*Leiomura*) off New Zealand. Although further effort will be made in this direction, most of the abundant resources of traditional species are likely to be in areas relatively close to the coasts of foreign countries. Thus, uncertainties about the future regimes for fisheries are a discouraging factor. Trawling in waters deeper than 500 m, expansion of skipjack fishing, particularly in the tropical Pacific, and the development of cephalopod resources in various parts of the world, are good possibilities. In general, however, prospects for further expansion of Japanese distant-waters fisheries to harvest conventional species by known methods do not appear bright.

Aquaculture.—As shown in Figure 16, the yield of marine aquaculture has been increasing steadily. Since aquaculture includes a variety of things, we must examine a breakdown of the total yield, which is shown in Table 7. Out of the total of 473,000 metric tons produced by marine aquaculture in 1969, 245,000 tons were oysters *with shell*. The equivalent figure for oyster meat is estimated at 37,000 tons. Next comes laver ("nori," *Porphyra*) at 134,000 tons; "wakame" (also seaweed, *Undaria*) accounts for 60,000 tons; the remainder, 34,000 tons, consists

TABLE 7.—Aquaculture production, excluding pearl culture, in 1969.

Aquaculture	Live weight
	<i>metric tons</i>
Marine:	
Laver	134,320
Wakame	59,821
Oysters (meat weight)	(36,988)
Oysters (shell weight equivalent)	245,458
Yellowtail	32,613
Puffer	52
Other fishes	481
Octopus	50
Shrimp (<i>Penaeus japonicus</i>)	295
Spiny lobster	2
Swimming crab	1
Other aquatic animals	102
Total	473,195
Freshwater:	
Trouts	10,254
Carps	13,971
Crucian carp	1,776
Eels	23,276
Other fishes	2,762
Total	52,039

Source: Ministry of Agriculture and Forestry (Japan) (1971).

of cultured fishes and various invertebrates. Thus, in terms of animal protein products, 37,000 tons of oyster meat and 34,000 tons of fish and other animals are all that is produced by marine aquaculture. Aquaculture for oysters and laver can still be expanded. It is facing, however, mounting problems arising from the industrialization of the coastal zone, particularly pollution and land reclamation. The main fish species for marine aquaculture in Japan is yellowtail (*Seriola*), others being quite insignificant in quantity. Shrimp culture in Japan is advertised all over the world, but actual production in 1969 was only 300 tons.

Freshwater aquaculture produces a substantial amount of fish: 23,000 tons of eels, 14,000 tons of carp, and 10,000 tons of trouts in 1969. The yields of these species have increased very substantially in the last 10 years, but the total production of freshwater fish culture is still a little over 50,000 tons. All aquaculture for fishes and crustaceans, in both seawater and fresh water, is carried out by intensive feeding. In most cases, fishes (largely coastal pelagic species) and fish meal are the main animal protein components of feeds. On a round-weight basis, the amount of feed fish required for yellowtail and eel culture is perhaps 7 to 8 times the amount

of fish produced. It is estimated that the consumption of fish meal for culturing eels and trouts alone might reach 100,000 tons in 1971 (the equivalent of half a million tons in live weight). Fish culture in Japan is obviously a means to produce high-priced products and not to increase the total supply of animal protein from the sea. While demand for cultured fishes remains very strong, the aquaculture of the two most important forms, eels and yellowtail, has a serious weakness. Their young have to be collected from natural waters. The domestic supply of young eels is declining, due at least partly to pollution in estuarine waters, and a substantial quantity is now being imported. The price of elvers is reported to be nearly \$38 a pound.

The above review of prospects for expansion of each of the main sectors of the fishing industry indicates that it will become increasingly difficult for the domestic supply of fish to meet the evergrowing demand. In the long run, better management of coastal fisheries may result in a substantial increase in the total harvest, but this is a painstaking and time-consuming process. Further exploitation of resources in distant waters may result in some increase, but the scarcity of readily exploitable resources and uncertainties about international problems are major obstacles. Expansion of aquaculture is possible, but it would have the effect of further reducing the total amount of food fish available as long as fish and fish meal are used as major components of feeds.

Exploitation of unconventional species.—Man will have to make serious attempts to exploit unconventional species in order to sustain a reasonably high rate of growth in fishery production. What is meant by unconventional species is those forms which occur in great abundance in wide areas of the ocean and which are difficult to harvest and market economically with known methods. The utilization of these resources is in a way a continuation of the recent trend for exploiting a greater variety of species. It appears, however, that some technological breakthroughs would be required to begin large-scale commercial exploitation of such forms as the Antarctic krill (*Euphausia superba*) and

other larger zooplankton, red crab (*Pleuroncodes*), lanternfishes (myctophids), gonostomatids, deepsea smelts (bathylagids), etc. Large concentrations of lanternfishes have been found in most parts of the ocean. An enormous biomass of bristlemouth (*Cyclothone*) occurs in the tropical Pacific. The abundance of deepsea smelts in the California Current system is well known. Particularly interesting in this respect is the existence of extensive offshore areas of upwelling associated with the equatorial current systems (Cushing, 1969).

The Soviet Union has been making effort to utilize *Euphausia superba* through experimental fishing and processing, with limited success. Japan has a modest program to explore the possibility of using larger zooplankton and progress has been reported in making some products out of euphausiids. Both nations still have a long way to go in this area. Furthermore, fish meal and other products into which these forms might be processed are unlikely to substitute for highly demanded conventional species although they might increase the supply of feeds.

International Business Arrangements

One might think that Japan must have been very active in developing joint ventures and other forms of international arrangements to carry out fishing from the coastal states near the fishing grounds. For a variety of reasons, her activities in this general category have been limited to a few things, such as use of facilities for transshipment of tuna caught by longliners, joint ventures for shrimping, and more recently joint ventures for skipjack live-bait fishing. Japanese trawlers operating in West Africa have been selling some of the catches locally and a few vessels still operate under contracts with local companies.

There are a variety of reasons for the lack of major developments in this general area. In many cases, the local governments establish various requirements as conditions for land-based foreign operations, such as investment in shore facilities or nationalization of equipment and crews. They may be reluctant to make such concessions as tax-free imports of equipment

and supplies. Political instability may make investments extremely risky. As long as the same types of fishing can be carried out by their own boats without heavy local investments, the Japanese companies would prefer not to make complicated arrangements with local firms or governments, except for use of local facilities for transshipment.

A major exception in this regard is shrimping, for most of the rich shrimp grounds are even now within the limits of national jurisdiction of coastal states. The existence of excellent international markets for shrimp makes joint ventures attractive even under difficult local conditions. A number of Japanese companies have recently begun shrimping in the rich grounds of Indonesia, including West Irian. Live-bait fishing for skipjack in areas far from the home islands is another type of operation which has to be carried out from local bases. Joint ventures with Australia (from New Guinea) and Indonesia (from West Irian) are now developing. Transshipping of frozen tuna through foreign bases is an essential part of the worldwide longline fisheries. Trawl fishing vessels in the Atlantic use Las Palmas and Cape Town as their main bases of operation.

The situation is changing, as more and more nations are inclined to extend their national jurisdiction. Already, use of local facilities is a condition for tuna fishing in the Banda Sea under the Japan-Indonesia agreement, and the delivery of catches by some vessels to local facilities is a condition for fishing under the Japan-Mauritania agreement. Payments are involved in both cases.

As far as the industry is concerned, fishing with payments, without further local involvement, might be preferable to other arrangements in many cases. The industry could include the amounts paid (if they are reasonable) in the costs of products and charge them to consumers. The main problem here is the official position of the Japanese government concerning the territorial sea and fishing jurisdiction. Payments could still be made under other names than licensing fees; for example, as payments for use of local facilities. The government of the coastal states, on the other hand, might not agree to

such an arrangement which could weaken their positions on jurisdiction. Since there are already precedents of this sort (Indonesia, Mauritania, and Australia), however, this approach may be used more widely in the future.

Another direction in which the industry might move is more direct investments in the prosperous foreign fishing and processing industries. The United States has gone far ahead of Japan in this area. Japan now has a small interest in the Peruvian fish meal industry. I do not quite understand why some of the large Japanese trade companies, which handle various fishery products, have not vigorously explored possibilities of direct investment in foreign fishing industries. The government used to discourage involvement of Japanese firms in foreign fishing ventures for fear of increasing competition with Japanese fisheries. But the main reason may now be that there are not many fisheries in foreign countries which offer long-term returns comparable to those expected from other industries, perhaps with the exception of fish meal and shrimp operations in some areas.

Imports

As shown in Figure 18, there has been a marked increase in imports of fishery products in the last 10 years, while exports have generally leveled off. For many years, however, the Japanese government has imposed rather strict restrictions on imports of fishery products, mainly based on two considerations: the balance of payment and the competition with domestic products. With the foreign exchange surplus increasing at an almost embarrassing rate, the balance of payment is no longer a problem. On the contrary, pressure is mounting for the government to facilitate importation of many items including food in general. Internationally, Japan has been urged by both developed nations (including the United States) and developing nations to relax trade restrictions. Also, the government must explore all means to accelerate foreign currency spending to reduce the rate of increase in the surplus and slow down inflation. Increased imports of food items are generally considered desirable from this point of view.

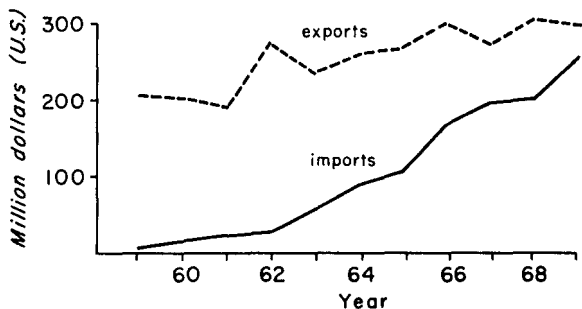


FIGURE 18.—Imports and exports of fishery products, 1959-69 (from Suisan-sha, 1970). Pearls are excluded. Figures for 1969 are estimates. ¥360 per dollar.

The liberalization of the import of fishery products began only in 1960, and a major change took place in 1961 when a number of fresh and frozen fishes and shellfishes were removed from the list of restricted items. Many items, however, still remain on the list mainly to protect the interests of inshore and coastal fisheries. The Japanese system of control of fishery imports is quite complicated. An attempt is made below to describe it briefly (from Suisan-sha, 1970).

As of 1970, all imports of fishery products fell under two categories: those which are not subject to quotas (Automatic Approval System, abbreviated AA) and those which are subject to quotas (Import Quota System, IQ). Among important AA items are a number of fresh or frozen fishes and shellfishes, including shrimp, tunas (including skipjack), swordfish, salmon, porgies, etc.; most of the canned fishes; and whale meat. Among important IQ items are a variety of fresh and frozen fishes, including herring, cod and pollack, yellowtail, mackerels, sardines and anchovy, jack mackerels, saury, cod (or pollack) roe, herring roe, as well as salted, dried, or smoked products of these species; laver and kelps; fish meal and whale meal, as well as mixed feeds or fish solubles; and fresh, frozen, or dried squid and cuttlefish. As Japan is now a party to IMF (International Monetary Fund) Article 8, all quotas are in principle on a global basis. A special quota system, however, is applied to imports of fishes and shellfishes caught

in coastal waters of South Korea; they can be imported within a fixed total value.

In terms of total value, shrimp (from the People's Republic of China, United States, Mexico, Thailand, and a number of other sources) has been the number one import item in recent years. Other important products imported are fish meal from Peru and South Africa, dry laver from South Korea, cuttlefish and octopus from West African fisheries (presumably shipped through Las Palmas), and tunas from Taiwan, Ryukyu, and South Korea.

Reviewing the actual quotas applied, it is obvious that import restrictions are still quite severe for some products. The amount of laver imported from South Korea has been controlled strictly to protect domestic laver culture, which is one of the most important sectors of the Japanese fishing industry. The amount of imported fish meal is also controlled to protect fish meal manufacturing in Japan both aboard factory-ships and ashore. In addition, the quantity of fish that can be purchased from foreign countries as raw material for fish meal (mainly pollack from the Soviet Union) is restricted. Some of the products which fetch extremely high prices are also tightly controlled. These include herring roe, as well as herring used for making dry herring and roe, cod and pollack roe, cuttlefish from West Africa, and some others.

Excepting laver, imports from South Korea are decreasing due largely to limited production in Korean coastal waters and growing domestic demand in Korea. In 1970, mackerels and jack mackerels, which had previously been excluded from items to be imported, were added to the list of products under the special value quota. The actual imports of these two forms in 1970 were very little because of strong demand in Korea. Future trend may be for the import of cultured oysters (just started) and clams, since Korea has a great potential for aquaculture in shallow waters. As Korea plans to expand her distant-water trawl fisheries in the North Pacific and West Africa, there may be pressure for increased imports of products from this source. Presumably, they will come under the global quotas of respective items.

Quotas for individual items are determined through consultations between the Ministry of Trade and the Fishery Agency of the Ministry of Agriculture and Forestry. The former normally presses for liberalization while the latter tends to resist it. In the case of fish meal imports, there is a conflict within the Ministry of Agriculture and Forestry, namely between the Fishery Agency and the Livestock Bureau, since the poultry and livestock industries in Japan want complete decontrol of fish meal imports.

Import duties on fishery products are in principle 10% on fresh and frozen items, 15% on salted and smoked items, and 20% on canned and related items. Duties on many AA items have been reduced gradually under the Kennedy Round system.

Further import decontrol is highly desirable and almost inevitable. Fish meal imports are due to be decontrolled, to a large extent, in the near future. The present plan is to determine, through consultations between the Fishery Agency and the Livestock Bureau, the amount of meal to be imported duty free, and to tax heavily any additional imports (in the neighborhood of \$56 a ton). The effects of this measure will depend largely on the amount to be fixed for duty-free imports. If the quantity determined is high enough, the net effect will be almost complete decontrol. If, on the other hand, the amount is adjusted to protect domestic manufacturers, the situation will not be too different from what it is now.

A further step which should be considered is the relaxation of restrictions on pollack imports. The Soviet Union now produces a large quantity of pollack (mainly in waters off Kamchatka), 598,000 metric tons in 1969 as compared with 1,944,000 tons caught by Japan. (Including the North Korean catch, the total yield of Pacific pollack probably exceeded 3 million tons in 1970.) Presumably, most of the Russian pollack catch goes into fish meal. If the Soviet Union can export pollack to Japan for surimi manufacturing, the value of the Soviet catch would increase very substantially. The Japanese government allows the import of raw material for fish meal, practically all pollack, within a global quota of 45,000 metric tons. Al-

though it is a global quota, the only country that can export pollack to Japan is the Soviet Union. A further strict condition is attached to pollack imports: fish must be processed into fish meal, fish oil, and solubles aboard Japanese ships before entering Japan. Initially, even production of pollack roe was prohibited, but this restriction was removed later. For the last 7 years, pollack have been purchased in west Kamchatka, the main Soviet fishing area, and processed on a Japanese factoryship. The price has been increasing gradually, and the Japanese company conducting this operation has been requesting the government to allow production of surimi, but this has not been approved. It is very difficult to understand why the processing of only 45,000 tons of pollack into surimi would do any harm to Japanese fishing companies or processors.

The basic question here is far beyond that of manufacturing a small amount of surimi under the present quota. Pollack fishing for surimi production is now the mainstay of the Japanese distant-water trawl fisheries. Demand for surimi is strong, and the pollack catch is going to level off sooner or later. Further intensification of Hokutensen fishing and Soviet fishing, and the expected expansion of the Korean fleet, will result in a sharp increase in fishing intensity in Kamchatka and North Kurile waters. Catch limits will become necessary, and I would not be surprised if the Soviet Union pressed for them in the near future. In the long run, it would be beneficial to Japan to increase, if necessary gradually, the purchase of pollack from the Soviet Union for surimi production. It would help meet growing demand; the value added in processing and marketing would be far greater than the value of raw material realized by the Soviet Union;³² increased imports from the Soviet Union would perhaps alleviate international fishery problems between the two nations. It is not certain what South Korea will do with increasing pollack catches. As pollack, processed into dry fish, has always been highly valued in Korea (both North and South), it is likely that the

³² The Soviet Union may already be producing surimi using imported Japanese equipment.

catches will be absorbed in Korean domestic markets. However, the Korean operators might try to export some of their catches to Japan or even develop their own surimi industry.

Further liberalization is in order for the import of products from South Korean coastal fisheries. Pressure from the Japanese laver culture industry is so strong that the Japanese government will not immediately relax restrictions on laver, but the present quota system for non-aquaculture products will become rather meaningless.

Another important item to be reconsidered is herring and herring roe. After the collapse of Japanese herring fisheries (Kasahara, 1961), domestic production of herring (mainly in Hokkaido) has become insignificant. Most of the Japanese catch now comes from waters off the coast of the Soviet Union and from the eastern Bering Sea. To meet part of the demand for herring roe and a dried herring product called "migaki," herring has been imported mainly from the Soviet Union either through transshipment on Soviet fishing grounds or as frozen herring. A small amount of frozen herring has also been imported from Alaska. A separate quota has applied to herring roe, the price of which is extremely high in Japan. Japanese companies initially had difficulties in teaching people in Alaska and Canada how to process herring roe, but the business is now firmly established along the coast from Alaska to the State of Washington. Importation of herring has been done through the Federation of Hokkaido Fishery Cooperatives acting as sole import agent. This system was adopted originally to minimize objections from Hokkaido fishermen. Importation of roe, on the other hand, is done by companies.

Herring fishing off the Soviet coast is now subject to severe restrictions under an agreement concluded in 1971. The amount taken by the mothership fishery in the eastern Bering Sea is still limited. The Hokkaido herring stock shows no sign of recovery. Import quotas are still low, 8,000 tons for herring and 500 tons for herring roe. The Japanese population is suffering from a ridiculously high price of roe. The present total consumption of herring pro-

ducts is only a small fraction of what it used to be before the collapse of the Japanese herring fisheries. Except for protecting the vested interest of Hokkaido fishermen, there is no social or economic justification for continuing the present system. Also questionable is an import quota for West African cuttlefish.

In addition to herring, most of the coastal pelagic species are also on the IQ list, including fresh, frozen, and most forms of processed products other than canned fish. Considering the rather small catches of these species made in the neighboring countries, I doubt that these restrictions have real significance. In short, it is about time for Japan to reconsider all trade restrictions on fishery products with a view to facilitating their import, even at the expense of the temporary suffering of some of the domestic fisheries, for increased imports would be beneficial to the population in general. There is a real danger of many of the fishery products becoming luxury items rather than main sources of animal protein supply for the population. This is already happening to a variety of products which were low- or medium-priced items only 10 to 15 years ago. The rapid development of a modern chicken industry in Japan, combined with the liberalization of meat and poultry imports, may make fishery products less and less important as main sources of animal protein.

Although the import quota system has been a major obstacle to the expansion of fishery imports, there are other problems also. The lack of know-how to produce products suitable for Japanese markets, for example, has made it difficult for many foreign countries to exploit export potentials. Except for such international commodities as fish meal, frozen shrimp, tuna, or canned fish, fishery products sold in Japan are very specific as to the method of processing and the quality of final products. The nature of the difficulty is demonstrated by problems which Japanese companies have encountered in the process of developing salmon and herring roe business in North America. In Peru, where anchovies are extremely abundant and cheap, nobody even thought of developing export business to exploit the Japanese market for boil-dried anchovies ("niboshi"). In the Far East and

Southeast Asia, domestic demand for fish is generally quite strong and most of the catches are consumed locally, except for such high-priced international commodities as shrimp or tuna. Some of these nations, particularly the Philippines and Ceylon, import large quantities of fishery products, some of them from Japan. There is no great surplus of low-priced fish in this general region.

The proportion of the combined value of fishery products in the total export value of Japan has been decreasing steadily, only 2.7% in 1968 and perhaps around 2% by 1971. Major export items in recent years have been frozen tuna, other frozen products, canned tuna, canned salmon, canned mackerel, and other canned products. Domestic demand for tuna is growing. Even canned albacore, which used to be a product entirely for export, is now consumed in a substantial quantity.

The Japanese people are extremely flexible in their consumption of fishes, and there is some demand for just about everything coming out of the sea. There are, however, certain trends of consumer preference that have become fairly obvious in the most recent years. First, demand for high-priced fishery products, such as raw tuna meat (particularly bluefin), shrimps, crabs, certain species of cephalopods, salmon, salmon and herring roe, certain species of flounders, yellowtail, eels, and a variety of species produced in inshore waters, is becoming stronger as the standard of living rises rapidly. Since most of these forms have limited supplies, their prices are pushed up sharply, more or less in proportion to the increase in the per capita income. Second, the sale of frozen seafood is going up very fast. This is, to a large extent, because of tremendous improvements made in recent years in the quality of frozen seafood through the introduction of better equipment. Third, demand for fish ham and sausage, which used to be very high, is now going down. This may be due to a greater consumption of true ham and sausage. Fourth, the production and consumption of traditional fish cakes, such as "kamaboko," "chikuwa," and their relatives using "surimi" as material, have gone up sharply as the supply of pollack surimi increased. Use of

other species than pollack for these products has decreased at the same time. Fifth, demand for fish meal as feeds for livestock, poultry, and aquaculture is very strong. It is met largely from three sources: pollack, mackerel, and imports. It is obvious that further increases in fish meal consumption will have to be met largely from imports, although domestic production may also grow further.

Even in Japan, large fluctuations in the catches of pelagic species are real problems. For example, the total catch of saury in 1970 was only 85,000 metric tons, as compared with over half a million tons in 1959, but in value the catch was the second largest in history because of the high price of saury, which used to be one of the cheapest fishes. Much of the sharply increasing catch of mackerel has gone into fish meal and oil, with smaller quantities used for direct consumption and canning, the latter mostly for export.

Conclusions

Examining sector by sector, the future of the Japanese fishing industry in general, and distant-water fisheries in particular, does not seem bright. Possibilities for further expansion are limited.

In inshore waters, major efforts are required to minimize the effects of pollution on the productivity of fishing and aquaculture. For coastal and offshore fisheries around the Japanese islands, better management could improve the efficiency of fishing and perhaps total production. The desirability of further decreasing the fishing effort of coastal trawl fisheries is obvious. For coastal pelagic species which make up the greatest portion of the catch from waters around Japan, management strategies based on scientific research have not yet been established, and the fisheries are always subject to large fluctuations in the catches of a few important species.

Distant-water fisheries are facing more and more difficult international problems, and due to a general trend of extension of national jurisdiction, further restrictions are expected. More exploratory fishing (particularly deepwater trawling), joint ventures, fishing in waters of national jurisdiction under conditions set by

coastal states, and development of foreign fisheries through investment by Japan, provide partial answers, and these lines will undoubtedly be pursued. The period of rapid expansion of distant-water fisheries, however, is practically over. The pollack stocks in the North Pacific, on which almost the entire Japanese trawl fisheries in that region depend, are being fished with increasing intensity. With the expansion of Soviet fishing and the entry of a large Korean trawl fleet, problems of conservation and allocation are likely to become major international issues in the near future.

Japan has made little progress in the exploitation of abundant resources of unconventional species. Although such a possibility might be explored more vigorously in the future, it would not solve most of the problems faced by the fishing industry. Further decontrol of the import of fishery products and increased import quotas will provide effective means to meet immediate problems of supply shortage and high prices. In general, too, the future of the Japanese fishing industry should be considered in the context of the rapidly expanding economy of this highly industrialized country. Labor shortage will become further acute, making many types of fishing economically infeasible. Japan, however, has two advantages over many of the other nations: the government has effective means to control the industry and the nation has strong domestic demands for a great variety of fishery products. The Japanese fishing industry will continue to be a competitive one on the international scene for some time to come although it will have to undergo many changes to meet new problems.

LITERATURE CITED

- ANONYMOUS.
1970. Gyogyo-no dōko ni kansuru nenji-hokoku. [Annual report on trends in fisheries, 1969.] [In Japanese.] (A report to Diet.) 246 p.
- BROADHEAD, G. C.
1971. International trade-tuna. FAO U.N. Dev. Programme IOFC/DEV/71/14 (Indian Ocean Fish. Comm.), 27 p.
- COMITINI, S.
1967. Economic and legal aspects of Japanese fisheries regulation and control. Wash. Law Rev. 43:179-196.
- COMMERCIAL FISHERIES REVIEW.
1971a. U.S. and Japan conclude fishery agreements. Commer. Fish. Rev. 33(1):3-6.
1971b. U.S. and USSR sign 3 agreements. Commer. Fish. Rev. 33(2):5-7.
- CUSHING, D. H.
1969. Upwelling and fish production. FAO Fish. Tech. Pap. 84, 40 p.
- FAO.
1971. Limits and status of the territorial sea, exclusive fishing zones, fishery conservation zones and the continental shelf. FAO Fish. Circ. 127, 33 p.
- FISHERY AGENCY (OF JAPAN).
1953. Gyogyo-ni kansuru kokusai-joyaku-shu. [Texts of international treaties concerning fisheries. Part 1.] [In Japanese.] 203 p.
1965. Nikkan gyogyo kyotei kankei, shutsugyo no tebiki. [A handbook for fishing operations under the Korea-Japan fishery agreement.] [In Japanese.] Suisan-sha, 315 p.
1970. Suisan sho-roppo. [Concise compendium of fishery laws, revised 1970.] [In Japanese.] Suisan-sha, 725 p.
- HARTT, A. C.
1966. Migrations of salmon in the North Pacific Ocean and Bering Sea as determined by seining and tagging, 1959-1960. Int. North Pac. Fish. Comm., Bull. 19, 141 p.
- HERRINGTON, W. C.
1971. Operation of the Japanese fishery management system. Law Sea Inst., Univ. R.I., Occas. Pap. 11, 21 p.
- KASAHARA, H.
1961. Fisheries resources of the North Pacific Ocean, Part 1. H. R. MacMillan Lectures in Fisheries. Inst. Fish., Univ. British Columbia, Vancouver, Canada, 135 p.
1963. Salmon of the North Pacific Ocean—Part I, Catch statistics for North Pacific Salmon. Int. North Pac. Fish. Comm., Bull. 12:7-82.
1964. Japanese fisheries and fishery regulations. In California and the world ocean, p. 57-61. [California Museum of Science and Industry, Los Angeles.]
In press. Extension of fishery jurisdiction. In Proceedings, Sixth Annual Conference, Law of the Sea Institute, Univ. Rhode Island, June 1971.
- KONDO, H., Y. HIRANO, N. NAKAYAMA, AND M. MIYAKE.
1965. Offshore distribution and migration of Pacific salmon (genus *Oncorhynchus*) based on tagging studies (1958-1961). Int. North Pac. Fish. Comm., Bull. 17, 213 p.

- LEONARD, L. L.
1944. International regulation of fisheries. Carnegie Endowment for International Peace, Wash., D.C., 201 p.
- MARGOLIS, L.
1963. Parasites as indicators of the geographical origin of sockeye salmon, *Oncorhynchus nerka* (Walbaum), occurring in the North Pacific Ocean and adjacent seas. Int. North Pac. Fish. Comm., Bull. 11:101-156.
- MARGOLIS, L., F. C. CLEAVER, Y. FUKUDA, AND H. GODFREY.
1966. Salmon of the North Pacific Ocean—Part VI, Sockeye salmon in offshore waters. Int. North Pac. Fish. Comm., Bull. 20, 70 p.
- MASUDA, S. (editor).
1963. Katsuo maguro soran. [Review of skipjack and tuna.] [In Japanese.] Suisan-sha, 844 p.
- MINISTRY OF AGRICULTURE AND FORESTRY (JAPAN).
1962-1971. Yearbook of production statistics for fisheries and aquaculture, 1961-1969. [In Japanese.]
- NEAVE, F., T. ISHIDA, AND S. MURAI.
1967. Salmon of the North Pacific Ocean—Part VII, Pink salmon in offshore waters. Int. North Pac. Fish. Comm., Bull. 22, 39 p.
- NORIN KEIZAI KENKYUSHO.
1965. Sekai suisan soran. [Review of world fisheries.] [In Japanese.] 974 p.
- OKA, N., H. WATANABE, AND A. HASEGAWA.
1962. The economic effects of the regulation of the trawl fisheries of Japan. In R. Hamlish (editor), Economic effects of fishery regulation, p. 165-208. FAO Fish. Rep. 5.
- SHEPARD, M. P., A. C. HARTT, AND T. YONEMORI.
1968. Salmon of the North Pacific Ocean—Part VIII, Chum salmon in offshore waters. Int. North Pac. Fish. Comm., Bull. 25, 69 p.
- SUISAN-SHA.
1970. Suisan nenkan. [Fisheries yearbook, 1970.] [In Japanese.] Suisan-sha, 560 p.