The Fisheries and Fishery Trade of the People's Republic of China

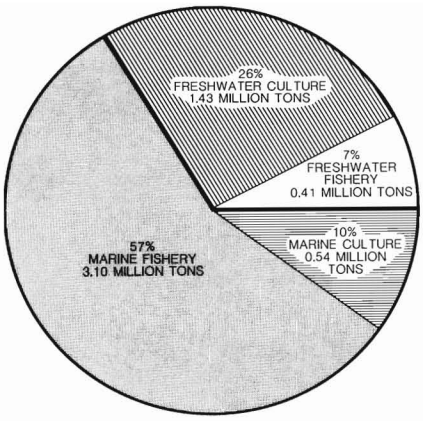

Figure 2.—China's total 1983 fisheries catch was 5.48 million t.

Introduction

The People's Republic of China (Fig. 1) is the world's third largest fisheries producer, after Japan and the Soviet Union (see related article on next page). Although Chinese fishermen caught nearly 5.5 million metric tons (t) in 1983, and an estimated record-high 6.0 million t in 1984, China's large coastal fishery is generally believed to be overexploited.

China, therefore, began studying distant-water fishing as a possible alternative to offset coastal overfishing. China has also increased its fish and shellfish culture, thus enabling it to continue as the world's leading aquacultural producer.

China is a net exporter of fishery products, with principal markets being Japan, Hong Kong, and the United States. In 1983, China shipped nearly $11.9 million worth of fishery products to the United States—mostly shrimp and other high-valued shellfishes. Because China plans to increase cultured fish and shellfish production, many observers believe that its fishery exports will also expand. Conversely, China was the fourth largest Asian market for U.S. fishery products—mostly frozen herring—in 1983.

Fisheries Catch

China's Bureau of Aquatic Products (BAP) estimates that China's 1983 fisheries harvest totaled nearly 5.5 million t (Fig. 2, Table 1), an increase of almost 10 percent (mostly from aquaculture) compared with the 1982 fisheries harvest of 4.9 million t. BAP estimated that the 1984 fisheries harvest was 6.0 million t, an increase of 11 percent over the 1983 harvest.

China's fisheries catch increased significantly after its fishery development policy was revised in 1979. This policy promotes improved management of wild fisheries and the expansion of marine and freshwater aquaculture. China hopes to realize the full potential of its fisheries by continuing to implement and improve fisheries management plans and expanding aquaculture production efforts.

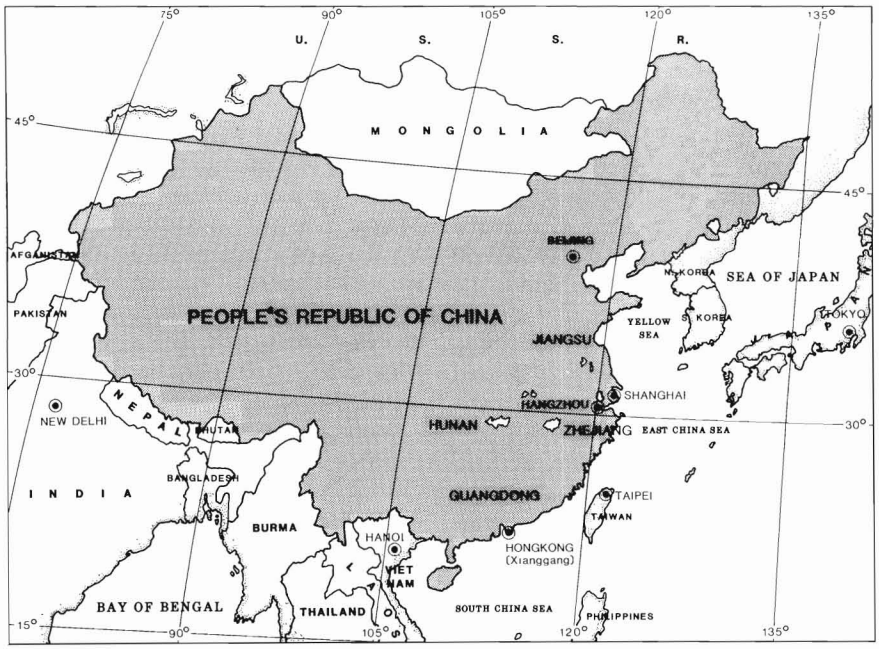

Figure 1.—The People's Republic of China.

Freshwater

China harvests freshwater fish and shellfish from both the wild and from fish culture projects. From 1979 to 1984, the freshwater catch doubled from 1.1 million t to about 2.2 million t, or 17 percent more than the 1.8 million t harvested in 1983. As in 1983, more than 80 percent of China's 1984 freshwater fish harvest was farmed. China was able to greatly increase its 1984 production because more than $78 million was invested in fish farming by collectives, other enterprises, and many individuals in the provinces of Guangdong, Hunan, and Jiangsu.

Capture Fishery

China's harvest of fishes totaled 0.4 million t in 1983, only 7 percent of the country's total fisheries catch and most-

Table 1.—China's fisheries catch, by quantity, 1979-84.

Fishery	Catch (1,000 t)					
	1979	1980	1981	1982	1983[1]	1984
Freshwater	1,115.9	1,239.9	1,373.5	1,562.0	1,843.0E	2,150.0E
Marine	2,938.4	2,995.4	3,003.5	3,364.7	3,614.0E	3,850.0E
Total	4,054.3	4,235.3	4,377.0	4,926.7	5,457.0E	6,000.0E

[1]E = Preliminary estimate.

ly various carps. Because this fishery cannot meet the domestic demand, China is promoting freshwater fish culture.

Culture

China is the world's largest producer of farmed freshwater fish, and used more than 3.0 million hectares in 1983 for fish culture. Still, the BAP estimates that the country could potentially employ nearly 5.0 million hectares of freshwater ponds. Grass carp, black carp, big head carp, mud carp, and tilapia are the principal species cultured. Most of the harvest is consumed domestically.

China's freshwater culture owes its success to several factors. Foremost, is the policy of making multiple use of water resources. While reservoirs and smaller farm ponds may be constructed primarily for irrigation or domestic use, they are simultaneously used for fish production.

Secondly, China integrates most of its freshwater fish farming with animal husbandry and agriculture. For example, agricultural crops are used to feed farm animals or poultry, whose manure is then collected to fertilize fish ponds. The humus that accumulates in the fish ponds is then recycled back to the cropland[1].

Thirdly, mixed species cultivation, or "polyculture," is widely practiced with great success. Finally, most fish growing regions of China have communes that specialize in hatchery production and rearing of fry for distribution to numerous growout ponds at other communes. The personnel at these "hatchery" communes are accomplished in such fields as induced spawning, selective breeding, larval rearing, disease prevention and treatment, and nutrition —areas normally thought to require highly specialized training in the West.

Provincial and municipal governments also promote freshwater fish culture. Beijing's Municipal Government is doing so especially because of unstable supplies of marine fishery products. Individuals, schools, Government agencies, army units, and other organizations are also being encouraged to culture freshwater fishes. Beijing's banks will extend credit for building ponds and developing feed processing methods, and municipal officials plan to reduce or remit taxes on production and sales of cultured freshwater fish for an unknown period. Organizations that leave suitable freshwater ponds unused in their vicinities are reportedly fined.

[1]Chinese officials believe that integrated fish culture is the most effective and efficient way to farm freshwater fish. Nevertheless, some fish farmers do not use integrated methods.

Marine

China's marine fisheries catch (3.6 million t in 1983) combines the harvests from mariculture, coastal fisheries, and distant-water fisheries. Most of the catch continues to be harvested by trawling (mostly pair trawling) or seining in coastal waters. The Chinese Government realizes that this coastal fishery is overexploited and is taking measures to protect and stabilize it, while studying distant-water fishing opportunities in the Pacific and Indian Oceans.

The Chinese reportedly manufacture their own engines, associated machinery, stern gear, winches, and windlasses. All electronic fishing aids and navigation equipment, apart from sonar, are also produced domestically. The Chinese manufacture their own netting, lines, ropes, floats, and hooks. Polyethylene appears to be the principal synthetic material used for ropes, but some nylon is used in purse seines.

China has expressed interest in Western fisheries technology, and the China Marine Industries Corporation and various Government fishery agencies organized "Fishery China '85", the Second International Fishery and Processing Exhibition, 16-21 November 1985, in Hangzhou, Zhejiang Province. Chinese officials attending the Exhibition were empowered to purchase Western fisheries technology.

Capture Fishery

Wild-caught fishes accounted for most of China's marine harvest in 1983 —nearly 3.1 million t, or almost 60 percent of China's total fisheries catch. Much of China's marine catch is made by 17 state-owned fishing corporations, of which the largest two are the Shanghai Marine Fisheries Company and the Dalian Marine Fishery Company. The predominant species landed by China's marine fishermen include filefish, hairtail, chub mackerel, yellow croaker, Spanish mackerel, and herring.

China Ranks Third in Fish Harvest

China's total fish catch in 1984 was 6 million metric tons (t), 500,000 t more than in 1983 and the third largest catch in the world, according to the New China News Agency. By 1990, China plans to have 60 percent of its catch (about 5 million t) in canned, processed, and frozen food sales.

Currently, 240 national fish processing plants produce 1,480,000 t of fish products. And, a national fisheries processing center is scheduled for construction in Shanghai to produce canned goods for major northern Chinese metropolitan areas. China also has 370 nationally operated freezing plants of various sizes. And, while commercial freezer construction has increased in recent years, small-scale, coastal commercial freezer production does not exceed 30,000 t.

China has increased its efforts to develop a distant-water fishery. In 1984, it entered into joint venture agreements with Japan, Mauritius, New Zealand, Somalia, and Sri Lanka, and may seek other joint venture partners in the future (see related articles on pages 77 and 83). China has also purchased several used seiners and trawlers from Japanese companies, as well as fishing gear and net-making equipment, and was reportedly attempting to negotiate the purchase of other fishing vessels from Japan. However, the Japanese may be reluctant to export more vessels to China for fear of competition with Japanese fishermen in the North Pacific.

China has also expressed an interest in obtaining fishing allocations within the U.S. 200-mile Exclusive Economic Zone (EEZ), and a delegation had an exploratory meeting with representatives of the U.S. Departments of State and Commerce in September 1984 to discuss fishing off Alaska. U.S. representatives briefed them on the status of fishery stocks off Alaska and on the need to negotiate a governing international fishery agreement (GIFA) before China could apply for allocations. U.S. officials also explained the rules and regulations that apply to foreign fishing vessels operating in the U.S. EEZ. Further talks were held in November in Beijing, and more were planned for Spring 1985.

Culture

China's mariculture production was a record-high 0.5 million t in 1983; sea cucumber, scallop, abalone, shrimp (mostly *Peneaus orientalis*), and various aquatic plants were the primary species (Table 2). Mariculture conditions in China are considered excellent. The country has a lengthy coastline with many estuaries, shoals, and mudflats ideal for fish farming. BAP estimates the saltwater culture capacity at 1.3 million hectares. Although recent data are unavailable, China reportedly exported $40 million worth of cultured marine fishery products in 1981.

Table 2.—Some of the marine species cultured in China.

Category	English name	Scientific name
Fish	Giant perch	*Lates calcarifer*
Shellfish	Blue mussel	*Mytilus edulis*
	Razor clam	*Sinonovacula constructa*
	Oysters	*Ostrea plicatula*
		Crassostrea gigas
		C. talienwhanensis
	Abalone	*Haliotis discus hannai*
	Scallop	*Chlamys farreri*
	Oriental shrimp	*Penaeus orientalis*
	Banana shrimp	*P. merguiensis*
	Crabs	N/A[1]
Other	Sea cucumber	*Stichopus* spp.
	Kelp	*Laminaria japonicus*
	Giant kelp	*Macrocystis pyrifera*

[1]N/A = Not available.

Fisheries Trade

China does not release detailed import and export statistics, making accurate fisheries trade analysis difficult. China reportedly imports few fishery products; instead, observers believe that it is trying to expand its fishery exports to earn foreign exchange.

Largest Market

Hong Kong is believed to be the largest market for Chinese fishery products, but it is not known how much Hong Kong re-exports elsewhere[2]. Japan is another large market for Chinese fishery product exports (Table 3) and has received more than 30,000 t annually since 1979—mostly shrimp, clams, crabs, jellyfish, and seaweed, and lesser amounts of eel, Spanish mackerel, and herring. Because China plans to increase marine fish and shellfish culture, many observers believe that its fishery exports will also expand.

Policy Changes

The Chinese Government has decided to relax the rigid control over its fishing industry and to promote fish farming to ease the nationwide shortage of fishery products. The decision to revise the fisheries marketing policy was made by the Communist Party's Central Committee, together with the State Council, and is aimed at quadrupling China's fisheries production and tripling per capita fishery consumption by the end of this century.

The new policy abolishes State purchase quotas for fishery products and establishes a free market in its place. Fish prices will now be set according to floating market rates, provided that the prices do not exceed or fall below an unspecified (at this writing) price range for the various species. When prices become too high or too low, the Government will regulate them either by buying the products or by increasing production.

The new marketing policy will be combined with reforms in China's management of the fishing industry aimed at simplifying fisheries administration and leaving more decisions to various independent provincial and municipal fishery corporations and cooperatives. These independent entities will then be responsible for their own profits and losses.

U.S.-China Fisheries Trade

The United States and China first began direct fisheries trade in the early 1970's. Although currently small, the potential of this trade is great. In 1983, fisheries trade between the United States

[2]Hong Kong imported 119,000 t of fishery products in 1982 and more than 124,000 t in 1983, over 50 percent of which is believed to have come from China. Hong Kong does not break down its fishery import statistics by country so precise figures are unavailable.

China's Aquaculture, 1984

China's aquaculture industry reportedly produced fish and shrimp totalling 2,450,000 metric tons (t) in 1984, with the marine culture sector totalling 600,000 t. The increase was due in part to an increase in fish farming area to 3,470,000 hectares, with 130,000 hectares of otherwise untillable land being brought under aquaculture. In addition the Provinces of Guangdong and Jiangsu received 100 million yuan in financing for fish pond renovation in 1984 and the China Ministry of Agriculture, Pastures and Farming provided aquaculture training courses in the Provinces of Jiejiang, Hunan, and Anwei. Farms specializing in fish and shrimp production also increased and group fish farming contracts encouraged by the government grew to 2,070,000 in 1984.

Table 3.—China's fishery exports to Japan, by species and quantity, 1979-84.

Category and species	Exports (t)					
	1979	1980	1981	1982	1983	1984[1]
Finfish						
Eel	10.5	98.0	298.8	444.8	744.8	817.7
Spanish mackerel	1,517.4	2,586.7	2,133.0	1,526.2	774.3	687.3
Herring	857.8	862.9	994.1	451.5	915.9	561.9
Puffer or blowfish	11.0	24.5	114.3	154.2	185.8	209.2
Horse mackerel			144.8	31.6	62.0	62.3
Croker	55.9	51.2	284.3	109.8	118.3	47.6
Pollock		3.7		12.0	50.5	14.2
Hairtails	28.9	30.7	53.9	17.6	30.8	12.5
Sea bream	4.5	2.5	18.4		7.8	5.1
Salmon	9.0	7.1	17.8		197.6	
Tuna	0.5	22.0	0.5	76.4	1.7	
Swordfish			0.4	1.0		
Sardine		0.3	0.9	0.4		
Other	1,001.3	1,863.2	3,357.7	4,161.1	3,633.4	4,692.0
Subtotal	3,496.8	5,552.8	7,418.9	6,986.6	6,722.9	7,109.8
Shellfish						
Clam	8,074.8	9,071.5	11,004.1	9,842.5	10,679.3	10,339.4
Shrimp	12,119.2	14,510.2	14,968.4	10,134.0	5,862.2	10,321.9
Crab	648.6	1,241.8	2,771.4	2,523.9	3,599.7	4,505.7
Squid/cuttlefish	857.7	692.3	290.1	560.3	430.9	454.6
Octopus	119.7	91.2	91.7	29.6	29.2	7.0
Lobster	13.3			2.9	4.2	6.7
Other	8,414.3	9,436.4	10,293.1	5,929.6	10,418.9	10,740.1
Subtotal	30,247.6	35,043.4	39,418.8	29,022.8	31,024.4	36,375.4
Other						
Jellyfish	644.0	1,652.5	1,059.3	1,802.5	2,672.9	1,765.3
Seaweed	152.0	790.4	1,421.7	1,852.5	2,311.3	1,716.9
Sea urchin	35.5	86.5	135.1	146.8	174.9	158.3
Misc.[2]		negl.[3]	negl.	negl.		
Subtotal	831.5	2,529.4	2,616.1	3,801.8	5,159.1	3,640.5
Grand totals	34,575.9	43,125.6	49.453.8	39,811.2	42,906.4	47,125.7

[1]Preliminary statistics.
[2]Mostly small pelagic species reduced to fishmeal and oil.
[3]Negl. = negligible.

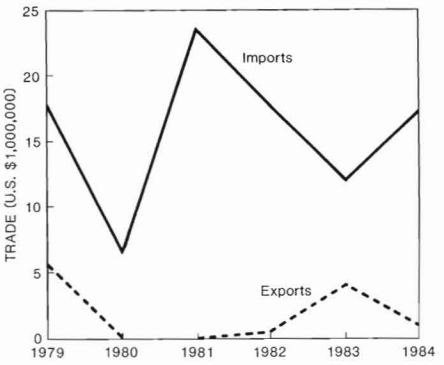

Figure 3.—U.S. fisheries trade with China, by value, 1979-84.

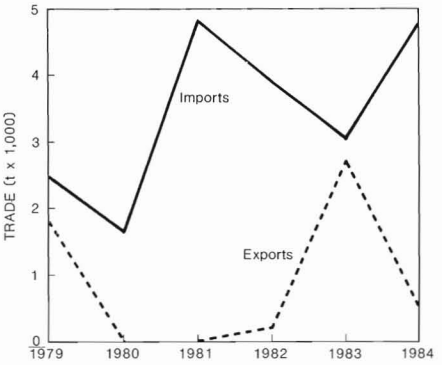

Figure 4.—U.S. fisheries trade with China, by quantity, 1979-84.

and China was nearly $16.0 million and in 1984 it was over $20.8 million (Fig. 3, 4). China's fishery imports from the United States have consisted mainly of herring, while exports to the United States are mostly shrimp and other high-valued shellfishes.

U.S. Imports

China currently supplies less than 1 percent of all U.S. fishery imports. The United States, nevertheless, is one of China's leading markets for fishery products, along with Japan and Hong Kong. Some Chinese-origin fishery products reach the U.S. market through re-export from other Asian countries. In 1984, the United States imported 4,750 t of fishery products directly from China, at a value of $20.2 million. The record high, 4,810 t valued at over $23.7 million, was in 1981 (Fig. 3, 4).

Commodities

In 1984, U.S. imports were mainly frozen shellfish, whole and filleted frozen fish, and canned fish (Tables 4, 5). These commodities have accounted for most of the quantity and value of Chinese fishery shipments to the United States in recent years. Frozen shellfish imports from China have fluctuated because of China's unstable shrimp production. The United States imported 1,877 t of frozen shellfish in 1984, 39 percent more than the 1,142 t imported in 1983.

China's shipments of whole and filleted frozen fish to the United States have fluctuated greatly during the past 5 years. The record year (by quantity) was in 1984, when 1,675 t worth $3.2 million was shipped. The previous record was 1981 when 1,500 t worth $3.3 million was shipped. The United States also imported 553 t of canned fish—mostly mackerel—worth nearly $0.8 million from China in 1984.

Species

Shrimp was by far the most important species imported in 1984 (Tables 6, 7). China's shrimp shipments to the United States decreased during 1982 and 1983 (because of unstable catches and quality control problems), but began to increase in 1984. While shrimp represented only 32 percent of the quantity of fishery products imported from China in 1984, it represented 62 percent of the total import value. Other shellfishes (i.e., scallops and oysters) showed sudden and significant increases in 1984.

The United States imported 1,512 t of shrimp, worth nearly $12.5 million,

from China in 1984, an increase of 42 percent by quantity and 51 percent by value compared with 1983. Most of the imported shrimp was shipped frozen (shell on); the rest was shipped either peeled and deveined, or canned. China generally ships three grades of shrimp to the United States: Superior, good, and marginal.

China's shipments of abalone, clams, crabs, oysters, and scallops to the United States showed a significant increase in 1983, and that trend continued in 1984. Almost 600 t of these high-valued shellfishes worth over $2.5 million, were shipped to the United States in 1984, an increase of 30 percent by quantity and 26 percent by value, compared with

Table 4.—U.S. fishery imports from China, by quantity and commodity, 1979-84. Source: U.S. Census Bureau.

Commodity	U.S. Imports (t)					
	1979	1980	1981	1982	1983	1984
Edible						
Fish						
Frozen						
Whole	696.7	536.5	1,506.7	1,381.8	740.3	1,394.4
Fillets	113.8	56.4	57.3	119.0	294.5	280.5
Canned	108.5	325.9	607.8	418.7	459.6	553.1
Cured	51.6	96.8	108.6	182.8	133.3	165.0
Roe	0.5	0.3	negl.	0.1	0.2	0.2
Other[1]	50.9	48.5	67.6	124.9	132.4	192.0
Shellfish						
Frozen	1,448.1	539.2	2,408.0	1,583.4	1,142.4	1,877.0
Canned	46.6	47.9	47.0	49.7	116.8	189.6
Other						46.7
Subtotal	2,516.6	1,651.6	4,802.9	3,860.4	3,019.5	4,698.5
Nonedible						
Fishmeal						20.9
Fish oil				1.3	2.6	
Other	3.3	4.8	6.3	6.1	34.0	27.3
Subtotal	3.3	4.8	6.3	7.4	36.6	48.2
Grand total[2]	2,519.9	1,656.4	4,809.2	3,867.8	3,056.1	4,746.7

[1]Includes fish sticks, pastes, etc.
[2]Totals may not agree because of rounding.

Table 5.—U.S. fishery imports from China, by value and commodity, 1979-84.

Commodity	U.S. imports (US$1,000)					
	1979	1980	1981	1982	1983	1984
Edible						
Fish						
Frozen						
Whole	995.5	833.2	3,299.7	2,763.3	1,461.3	2,686.9
Fillets	181.1	108.1	116.2	213.2	519.9	523.3
Canned	203.5	518.0	814.1	691.1	883.2	772.6
Cured	203.3	512.4	471.7	779.9	560.6	619.5
Roe	50.2	33.2	3.4	2.9	24.8	7.2
Other[1]	239.2	209.0	249.5	477.9	356.5	442.8
Shellfish						
Frozen	15,327.5	4,091.3	18,454.0	12,889.3	7,480.5	14,459.3
Canned	279.2	135.4	178.1	214.8	406.0	451.5
Other						65.2
Subtotal	17,479.5	6,440.6	23,586.7	18,032.4	11,692.9	20,028.3
Nonedible						
Fishmeal						10.6
Fish oil				4.9	10.5	
Other	70.9	84.3	138.1	84.4	190.4	201.3
Subtotal	70.9	84.3	138.1	89.3	200.9	211.9
Grand total[2]	17,550.4	6,524.9	23,724.8	18,121.7	11,893.8	20,240.2

[1]Includes fish sticks, pastes, etc.
[2]Totals may not agree because of rounding.

Table 6.—U.S. fishery imports from China, by quantity and species, 1979-84.

Category and species	U.S. imports (t)					
	1979	1980	1981	1982	1983	1984
Edible						
Fish						
Mackerel	11.1	110.7	333.4	225.2	173.2	296.4
Flatfish	15.3			10.0	140.1	135.8
Pollock				36.0	36.0	246.6
Groundifsh	16.1	27.4	29.3	45.2	35.9	163.1
Pacific cod	0.5		0.2		22.3	6.4
Herring	3.3	2.6	0.2	3.0	0.3	0.5
Sardines	4.4	6.9	1.5	25.6		23.5
Tuna	0.6	3.0	333.0	354.5		213.1
Other	923.8	884.0	1,595.5	1,446.0	1,275.9	1,367.3
Shellfish						
Shrimp	1,355.6	435.5	2,298.6	1,305.2	879.0	1,512.7
Oysters	13.5	20.1	12.7	16.3	82.5	145.3
Crabs	0.6	0.5	37.3	37.4	68.3	145.6
Clams	17.0	36.1	31.1	54.6	58.9	38.6
Scallops	0.2	0.4	0.6	1.5	23.6	1.9
Abalone	1.2	7.4	4.2	7.6	12.4	7.3
Lobsters	7.2	5.8	0.2	1.7	6.9	31.0
Other	99.4	93.2	108.3	253.3	163.2	229.9
Other items[1]	46.8	18.0	16.7	37.2	40.9	133.4
Subtotal[2]	2,516.6	1,651.6	4,802.9	3,860.4	3,019.5	4,700.2
Nonedible	3.3	4.8	6.3	7.4	36.6	46.5
Grand total[2]	2,519.9	1.656.4	4,809.2	3,867.3	3,056.1	4,746.7

[1]Includes fish sticks, pastes, etc.
[2]Totals may not agree because of rounding.

Table 7.—U.S. fishery imports from China, by value and species, 1979-84.

Category and species	U.S. imports (US$1,000)					
	1979	1980	1981	1982	1983	1984
Edible						
Fish						
Flatfish	23.0			18.4	274.3	284.2
Mackerel	10.4	71.6	227.8	146.4	125.4	208.7
Groundfish	44.1	95.2	99.5	132.8	92.2	307.1
Pacific cod	1.2		1.1		38.3	11.1
Pollock				54.0	34.9	337.6
Herring	4.4	2.9	0.1	17.3	0.6	0.3
Sardines	4.9	6.2	1.9	35.6		26.4
Tuna	0.4	9.3	904.4	909.5		292.6
Other	1,570.5	1,890.8	3,536.7	3,279.4	3,031.4	3,357.1
Shellfish						
Shrimp	14,904.4	3,455.8	17,718.4	11,525.4	6,055.1	12,450.8
Scallops	6.8	17.1	25.0	32.4	258.1	57.2
Oysters	115.6	87.3	63.2	78.3	252.5	318.9
Crabs	2.4	3.9	91.9	124.1	197.1	446.3
Abalone	15.7	60.5	68.2	133.5	181.3	135.7
Clams	18.5	58.8	68.6	94.5	99.3	66.4
Lobsters	27.5	40.7	1.7	15.7	73.5	261.8
Other	515.9	521.2	650.8	1,154.1	817.3	1,236.2
Other items[1]	214.1	119.3	126.7	281.2	161.7	229.8
Subtotal[2]	17,479.5	6,440.6	23,586.7	18,032.4	11,692.9	20,028.2
Nonedible	70.9	84.3	138.1	89.3	200.9	211.5
Grand total[2]	17,550.4	6,524.9	23,724.8	18,121.7	11,893.8	20,240.2

[1]Includes fish sticks, pastes, etc.
[2]Totals may not agree because of rounding.

1983. The 1983 imports of these species totalled 246 t, worth nearly $1.0 million and double the 1982 figures of 117 t and $0.5 million, respectively.

U.S. Exports

China was the fourth largest Asian market for U.S. fishery products in 1983, after Japan, Korea, and Taiwan, and receiving direct exports of over 2,700 t, worth almost $4.1 million. However, direct U.S. fishery exports to China in 1984 were only 456 t, worth about $0.7 million.

It is not known how many U.S. fishery products reach China indirectly through re-exports, or consignment sales through third countries. U.S. fishery exports to China in 1982, 1983, and 1984 consisted almost entirely of frozen whole herring which was further processed in China (Fig. 3, 4; Tables 8, 9).

Table 8.—U.S. fishery exports to China, by quantity and commodity, 1979-84.

Commodity	1979	1981	1982	1983	1984
Edible					
Finfish					
Frozen					
Whole	1,112.0		226.2	2,691.1	455.6
Fillets				10.7	
Canned					
Cured	654.0		0.7		
Roe			2.4	2.5	
Other					
Shellfish					
Frozen					
Canned				0.5	
Other[1]					
Subtotal	1,766.1		229.2	2,704.7	455.6
Nonedible					
Fishmeal					
Fish oil		0.2			
Other					
Subtotal		0.2			
Grand total[2]	1,766.1	0.2	229.2	2,704.7	455.6

[1]Includes fish sticks, pastes, etc.
[2]Totals may not agree because of rounding.

Table 9.—U.S. fishery exports to China, by value and commodity, 1979-84. Source: U.S. Census Bureau.

	Exports (US$1,000)				
Commodity	1979	1981	1982	1983	1984
Edible					
Finfish					
Frozen					
Whole	3,047.0		436.3	4,011.3	684.2
Fillets				30.6	
Canned					
Cured	2,162.8		18.1		
Roe			11.5	24.0	
Other					
Shellfish					
Frozen					
Canned				3.2	
Other[1]					
Subtotal	5,209.8		465.9	4.069.2	684.2
Nonedible					
Fishmeal					
Fish oil		0.5			
Other					
Subtotal		0.5			
Grand totals[2]	5,209.8	0.5	465.9	4,069.2	684.2

[1]Includes fish sticks, pastes, etc.
[2]Totals may not agree because of rounding.

New Customs Rules

China has also announced new customs regulations for various goods, including fishery products (Table 10). Effective 10 March 1985, duties were assessed according to the country of origin rather than exporting company. There are two tariff rate systems: 1) a "Minimum Tariff Rate" is applied on goods originating in countries with which China has mutually beneficial trade treaties or agreements, and 2) a "General Tariff Rate" is applied on goods from countries without special bilateral trade agreements. The reason why China is reducing the tariff rate on imports of certain fishery products and fishing vessels is because China cannot produce sufficient quantities of fish to supply its domestic demand, and because it cannot build enough high-quality fishing vessels.

It is not yet clear what China's policy changes mean for U.S. fishery exports to that nation. Some observers believe that there is a possibility that U.S. fishery exports to China, especially for inexpensive and underutilized species, such as Alaska pollock, may increase as a result of China's fishery marketing reforms. (Sources: IFR-84/104B, 85-27, and 85-28.)

Table 10.—China's customs regulations before and after 10 March 1985.

	Tariff rate (percentage)	
Product	Pre-March 10	Post-March 10
Powered ships (fishing vessels)	20	9
Freshwater and marine fish species	80	30
Abalone	150	60
Shark fins	150	60
Sea cucumbers	150	60

China Forms Joint Ventures With Japan, New Zealand

The first Japan-China fisheries joint venture, the Danyo Fisheries Company[1], was scheduled to begin operation in early 1985. The joint venture was formed between Japan's Taiyo Fisheries Ltd. and China's Danshan Fishing Company, which reportedly proposed the joint venture to Taiyo in 1983. China has supplied 55 percent of the initial capital of more than $1.2 million, while Taiyo supplied the remaining 45 percent.

The Danshan Company has purchased six fishing vessels from Japan for catching cutlassfish, drum, and sharp-toothed eel, all for export to Japan for processing. Another ten purse seiners and freezer vessels are sought. The joint venture will also be involved in shrimp farming near Shanghai and Dalian.

Yet another joint venture has been formed between Japan's Taiyo Gyogyo and a fisheries company in Chekiang Province. This new company is capitalized at ¥300 million (US$1.3 million), 55 percent from the Chinese partners. Immediate plans called for bringing trawlers from Japan to fish hairtail and croaker for sale in China. Future plans include expanded fishing operations and shrimp culture.

China also agreed to establish a shrimp farming joint venture with New Zealand, the first joint venture of any kind between the two countries. Chinese shrimp culture technicians were scheduled to visit New Zealand earlier in 1985 to study sites for shrimp farming. After a suitable site is chosen, a company will be formed which will be owned 60 percent by New Zealand interests and 40 percent by China. The two sides hope to begin commercial production to supply both New Zealand and foreign markets within 3 years. The joint venture marks the first time that China will utilize, on a commercial basis, its own shrimp farming expertise in another country.

[1]Mention of trade names or commercial firms does not imply endorsement by the National Marine Fisheries Service, NOAA.

Japan's Pacific Salmon Fisheries and Trade, 1974-84

A. George Herrfurth

Introduction

Japan obtains Pacific salmon, *Oncorhynchus* spp. (Table 1), from four sources: 1) A coastal trap-net fishery (based on returns of salmon released from hatcheries), 2) a high-seas catch, 3) imports, and 4) cage culture. This salmon supply more than doubled between 1974 and 1984 (Table 2).

An increased salmon demand, a decreased high-seas catch, and the deisre to reduce dependence on salmon imports and help domestic fishermen, prompted the Japanese Government to expand the salmon hatchery program in 1979. Hatchery returns have grown steadily since, and accounted for 45 percent of Japan's salmon supply in 1983, according to the Japan Fisheries Agency (JFA).

Japan's annual salmon imports averaged 10,000 metric tons (t) in the middle 1970's, owing to lower demand and no 200-mile fishing zone restrictions. Since then, however, the United States has become Japan's leading salmon supplier and exports to Japan increased markedly during the past decade because of Japan's growing salmon demand and decreasing high-seas catches. Japanese imports of U.S. salmon were over 96,000 t in 1983, but were expected to be lower in 1984 because of an over-supply of salmon in Japan.

Japan's hatchery programs, however, cannot completely replace imports. Chum salmon, *Oncorhynchus keta*, is the primary species in the Japanese hatchery program, while most imported salmon is sockeye, *O. nerka*. The coho salmon, *O. kisutch*, is the primary cage-cultured species.

Table 1.—Names of the Pacific salmon.

English name	Japanese name	Scientific name
Cherry salmon	masu	*Oncorhynchus masou*
Chinook salmon[1]	masunosuke	*O. tshawytscha*
Chum salmon	sake	*O. keta*
Coho salmon[2]	gin-zake	*O. kisutch*
Pink salmon	karafuto-masu	*O. gorbuscha*
Redspot salmon	amenouo	*O. rhodurus*
Sockeye salmon[3]	beni-zake	*O. nerka*

[1]Also called king salmon.
[2]Also called silver salmon
[3]Also called red salmon; the land-locked form is called kokanee salmon.

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Table 2.—Japan's salmon supply, 1974-84[1].

Year	Catch (1,000 t) Coastal[2]	High-seas[3]	Culture	Total	Trade (1,000 t) Imports	Exports	Balance	Total supply (1,000 t)
1974	39.2	86.9		126.1	8.3	13.1	+ 4.8	121.3
1975	64.2	91.0		155.2	10.7	19.9	+ 9.2	146.0
1976	38.1	82.2		120.3	9.5	20.8	+ 11.3	109.0
1977	45.5	62.6		108.1	26.4	4.7	- 21.7	129.8
1978	59.1	41.5	0.1	100.7	57.9	4.2	- 53.7	154.4
1979	87.3	42.4	0.4	130.1	64.7	1.7	- 63.0	193.1
1980	79.9	42.5	1.9	124.3	48.7	1.3	- 47.4	171.7
1981	107.9	42.5	1.2	151.7	83.1	1.7	- 81.4	233.1
1982	101.5	42.4	2.1	146.0	117.7	0.5	- 117.2	263.2
1983	120.6	42.5	2.9	166.0	108.5	0.9	- 107.6	273.6
1984	N/A[4]	40.0	4.5E[5]	N/A	N/A	N/A	N/A	N/A

[1]Catch is given in live weight and trade statistics are in product weight. Since over 90 percent of all salmon imported in recent years was whole fresh or frozen, the total supply weight has only a small margin of error.
[2]The Japanese refer to this catch as the "hatchery returns" catch. In addition to the inshore coastal catch, the figures also include the inland salmon catch, but exclude a small cherry salmon and landlocked salmon catch.
[3]The Soviet-granted catch quota was 42,500 t from 1978 to 1983; in 1984, it was reduced to 40,000 t.
[4]N/A = Not available.
[5]E = Estimate.

Table 3.—Japan's salmon catch, by species, 1974-83.

Species	Catch (t) 1974	1975	1976	1977	1978	1979	1980	1981	1982	1983[1]
Chum	80,146	99,485	78,417	71,931	74,089	101,466	96,920	120,801	111,760	
Pink	32,537	45,936	29,629	35,264	17,176	24,060	20,101	25,509	20,797	
Coho	9,713	8,161	7,697	3,757	5,755	2,708	3,634	3,285	5,022	
Sockeye	8,155	7,733	8,844	4,601	5,261	5,510	6,070	5,227	4,269	
Cherry	3,101	3,871	3,814	3,822	3,600	2,669	2,777	3,296	3,661	
Chinook	1,867	1,115	1,604	908	1,075	1,227	2,484	1,381	1,018	
Total[2]	135,519	166,301	130,005	120,283	106,956	137,640	131,986	159,499	146,527	166,000

[1]Preliminary estimate.
[2]FAO and Japanese catch statistics do not always agree (see "Total catch" in Table 2).

The Fisheries

Japan catches salmon in both coastal and high-seas fisheries and farms them in coastal cages. Until the middle 1970's, most of Japan's catch was taken by the high-seas fleet. However, the Soviet declaration of a 200-mile fishing zone in 1976, and subsequent insistence that the Japanese reduce their high-seas catch of Soviet-origin salmon, sent Japan's high-seas catch to a low of 107,000 t in 1978.

The Government enlarged its hatchery program in 1979 to improve coastal harvests, and the program has been remarkably successful. Thus, the increasing coastal catch helped Japanese fishermen land a record 166,000 t of salmon in 1983. Several species of Pacific salmon are caught by Japanese fishermen, but most (>75 percent in 1983) are chum salmon (Table 3).

Coastal

Japan's coastal salmon fishery is conducted almost entirely with fixed gear. Trap nets are set in shallow coastal waters near the natal rivers where the hatchery-produced salmon return to

Table 4.—Salmon hatchery programs in Hokkaido and Honshu, 1974-87.

Year	Fry released (in millions)			Salmon returns[1] (1,000 t)		
	Hokkaido	Honshu	Total[2]	Hokkaido	Honshu	Total[2]
1974	485	272	757	35.1 (2.2)	4.0 (0.8)	39.2 (1.8)
1975	802	344	1,146	57.6 (2.7)	6.7 (0.9)	64.2 (2.2)
1976	523	287	810	32.1 (1.9)	6.0 (0.7)	38.1 (1.5)
1977	693	413	1,106	37.3 (2.3)	8.2 (0.8)	45.5 (1.7)
1978	779	433	1,212	48.0 (2.7)	11.2 (1.1)	59.2 (2.1)
1979	873	590	1,463	69.0 (2.4)	18.7 (1.5)	87.7 (2.1)
1980	1,146	750	1,896	56.4 (3.0)	25.4 (2.4)	81.8 (2.8)
1981	1,080	738	1,818	80.0 (3.2)	29.1 (1.9)	109.1 (2.7)
1982	1,108	864	1,972	73.1 (2.6)	30.4 (1.9)	103.6 (2.3)
1983	1,147	829	1,976	84.0 (2.6)	39.5 (1.8)	123.5 (2.3)
1984	1,179[3]	846[3]	2,025[3]	N/A[4]	N/A	N/A
1985	N/A	N/A	N/A	N/A	N/A	N/A
1986	N/A	N/A	N/A	N/A	N/A	N/A
1987	N/A	N/A	N/A	100.7 (2.5)E[5]	40.2 (1.9)E	140.9 (2.3)E

[1]Includes cage-culture production. Data in parentheses indicate percentage rates of return of salmon fry released 4 years earlier.
[2]Totals may not agree because of rounding.
[3]Releases planned for 1984.
[4]N/A = Not available.
[5]E = Estimated from salmon fry released in 1984.

Table 5.—JFA budget for the Salmon Culture Program, 1979-84.

Item	Budget (millions of yen)					
	1979	1980	1981	1982	1983	1984
Cost of governmental hatcheries	¥2,005	¥2,200	¥2,264	¥2,186	¥2,218	¥2,070
Subsidies to private hatcheries[1]	1,241	1,386	1,409	1,289	1,241	1,172
Total (millions of yen)	¥3,246	¥3,586	¥3,673	¥3,475	¥3,459	¥3,242
Total (millions of U.S. dollars)	$14.7	$15.9	$18.6	$13.9	$14.5	$14.1

[1]The 1951 "Aquatic Resources Conservation Law," obligates the Japanese Government to subsidize the expenses of privately managed salmon hatcheries, provided that coastal fishermen also bear part of the expenses.

spawn after being at sea 3-7 years.

The coastal fishery is also entirely dependent on the returns of hatchery-raised chum salmon. Those which escape this commercial fishery, and continue their migration upriver, are collected in weirs for delivery to hatcheries where they are spawned to complete the life cycle.

Japan's salmon hatchery programs have been exceptionally successful, and returns have increased steadily. The coastal catch of hatchery-produced salmon increased from 39,200 t in 1974 to 120,600 t in 1983, or by 200 percent (Table 2). The increased returns were especially pronounced during the early 1980's and were the result of the 5-year (1979-83) salmon culture program sponsored by the Japanese Government.

This program was carried out by 44 governmental and about 220 private hatcheries in Hokkaido and Honshu, and increased releases and new release methods reportedly insured the program's success. Although the salmon return 3-5 years after release, the JFA calculates the returns for an average 4-year period (Table 4).

Japan released nearly 2 billion salmon fry in 1983 (1.2 billion from government hatcheries and 0.8 billion from private hatcheries). Most (1.8 billion—94 percent) were chum fry. The Japanese also released small amounts of sockeye; pink, *O. gorbuscha*; cherry, *O. masou*; and kokanee, *O. nerka*, salmon fry in 1983. Japanese coastal fishermen expect to harvest 140,900 t, or about 38.6 million mature salmon in 1987.

The JFA has expressed concern about a new 5-year salmon hatchery program (1984-88) because of the long-term effect it might have on prices and the costs involved. If the 1987 projected hatchery returns are accurate and if salmon imports continue to increase, JFA officials believe that salmon supplies might exceed the demand, resulting in lower prices. The JFA is therefore considering a hatchery enhancement program for fry of such high-valued species as cherry and sockeye salmon (i.e., qualitative rather than quantitative hatchery enhancement). The JFA is also considering sponsoring new efforts to advance the return season of chum salmon to increase its oil content and value since the Japanese prefer a "fatty" salmon.

Financial problems are also affecting plans for a new 5-year salmon hatchery program. The Japanese Finance Ministry does not wish the JFA to continue assuming the large burden of financing the hatchery program and believes that coastal trap-net fishermen should contribute more to the hatchery program since they benefit most from the salmon returns. In 1983, Japanese fishermen paid only $5.5 million of the $20.0 million spent on the hatchery enhancement program, while the JFA salmon culture budget supplied the remaining $14.5 million (Table 5).

High-Seas

Japan's high-seas salmon fishery consists of mothership, drift-net, and long-lining operations in the North Pacific. Japan also depends on annual catch quotas granted by the U.S.S.R. for its high-seas salmon catch, about 90 percent of which was spawned in Soviet rivers[1].

Until 1977, Japan obtained most of its salmon from the high-seas (65 percent in 1974). By 1983, however, only 16 percent came from this fishery (Fig. 1), as the Soviet quotas were reduced more than 52 percent (from 83,000 t in 1974 to 40,000 t in 1984).

The most significant quota reduction occurred in 1978 when the U.S.S.R. proposed a total ban on the Japanese high-seas salmon fishing and, as a compromise, reduced Japan's salmon quota from 62,000 t to 42,500 t, where it remained through 1983. During the 1984 negotiations, the Japanese high-seas salmon quota was further reduced to 40,000 t.

The bilateral salmon agreement also requires Japan to pay fishery fees. These are paid in goods related to the enhancement of the Soviet Pacific salmon industry. Although Japan's annual high-seas salmon quota was constant between 1978 and 1983, Soviet fishing fee demands increased. In 1978 Japan paid Russia $8.5 million ($200/t), and in 1983 the fees had more than doubled to $17.9 million

[1]In addition to the U.S.S.R. salmon quota, established by a bilateral agreement, Japanese fishermen also operate under the terms of the International North Pacific Fisheries Convention (INPFC).

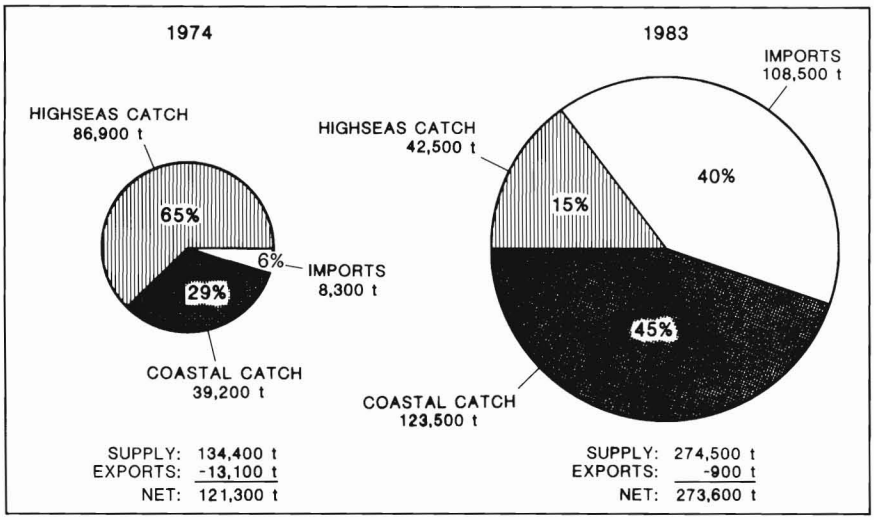

Figure 1.—Japan's salmon supply, excluding exports, 1974 and 1983.

Table 6.—The seven Japanese chum salmon gradings, after W. C. Atkinson (1984), "The Japan Salmon Market with Emphasis on the Market for Kotzebue Chum Salmon").

Grading	Description
Mejika	"Ocean bright" salmon taken in the high-seas catch; mean is firm, skin color is healthy.
Ginke	"Silver bright" salmon taken in the coastal catch; meat is firm, skin color is healthy.
Buna "A"	"Dark salmon" taken in the coastal catch; color of skin and flesh is slightly changed.
Buna "B"	"Dark salmon" taken in the coastal catch; skin and flesh colors have darkened.
Buna "C"	"Dark salmon" taken in the coastal catch. This is the darkest colored chum in the coastal catch.
River Buna	"River dark" salmon taken in rivers (inland catch); these are salmon taken just prior to spawning.
Marked	Damaged or wounded chum salmon.

($421/t). The Japanese Finance Ministry has criticized this fee because the Japanese fishing industry pays only 55 percent of it, while the remaining 45 percent is subsidized through the JFA budget.

Cage Culture

Japanese fish farmers raise only the coho or silver salmon in ocean cages. Salmon farming began in 1973 when 1 million coho eggs were imported from the United States for experimental freshwater culture. Japanese pen-farming operations switched to ocean-cage farming in 1975 because the salmon had a slow growth rate in fresh water.

Japan's coho production increased from 72 t in 1978 to 2,900 t in 1983 (Table 2) and all was consumed domestically. Japanese companies expected to harvest 4,500 t of farmed salmon in 1984 and as much as 8,000 t by 1990. More than half of the 1984 harvest will be produced by the Nichiro company (2,500 t), followed by Taiyo (1,000 t), Nichimo (500 t), and various smaller companies (500 t). The Japanese Government does not offer financial incentives to salmon farmers as they do to private salmon hatchery operations, and apparently prefers to "let the market decide."

Domestic Markets

Salmon is popular in the Japanese diet, especially as a holiday gift item. Consumption was minimal before 1960, however, and limited mainly to northern Japan where the fish were caught. Since then, salmon consumption has increased throughout Japan owing to population growth, extensive advertising, fluctuating supplies of other fishery products, and an increase in per capita income. Observers forecast that the Japanese salmon consumption will expand if prices do not increase significantly.

Japan's salmon market was over-supplied in 1983 by record coastal catches and large imports. This depressed salmon prices and, in some instances, resulted in their dumping. Although the JFA projected that the fall 1984 coastal catch would be lower than in 1983, observers believed that 1984 salmon imports would also decline.

Commodities

Most salmon in Japan is salted, smoked, or canned; the rest is consumed fresh. Although per capita consumption of salted and smoked salmon has increased greatly in recent years, fresh salmon consumption has increased only marginally, perhaps because the Japanese traditionally favor salted and smoked salmon over fresh salmon.

Salmon roe, a favored delicacy in Japan, is mostly cured, either as "sujiko" (in the membranous skein) or "ikura" (eggs separated from the skein). It is especially consumed during the New Year holidays (Oshogatsu).

Species

Chum salmon is the cheapest and most abundant salmon in Japan, and more of it is consumed there than any other salmon. Mostly salted or smoked, it is obtained from the coastal catch; only small quantities are processed from imports or the high-seas catch.

When landed, chums are systematically graded by age and condition. Those with bright skin, firm and "good color" flesh, and high fat content are rated highest, while old and spent or damaged salmon are rated among the lowest of the seven gradings (Table 6).

Chum salmon have long been popular gifts in Japan. However, Japanese wholesalers see a need to reassess the so-called "gift salmon" market since the 1983 record-high chum landings depressed market prices. Lower prices resulted in decreased demand as many Japanese consumers saw the low-priced and abundant product as an undesirable gift item. One Japanese wholesaler believes that Japanese consumers may switch from chum to sockeye as a gift item if there is an over-supply of chum in the future, since sockeye is not only more expensive, but is also thought to be a better tasting, fattier salmon with redder flesh.

Sockeye and pink salmon are also popular in Japan. Sockeye is the species

Figure 2.—Japan's salmon imports and exports (product weight), 1974-83.

most imported, while the pink accounts for Japan's second-largest salmon catch. Both species are favored by Japanese buyers who prefer that fish be landed or imported in the "princess cut" style (head-on) so quality-conscious consumers can better evaluate it for eye clarity and proper handling.

Trade

Before 1977, Japan exported more salmon than it imported. Since then, however, increasing demand (especially for species less harvested by Japanese fishermen), combined with declining high-seas catches, have greatly increased salmon imports (Fig. 2, Table 2), i.e. 108,500 t were imported vs. 900 t exported in 1983.

Imports

Japan's salmon imports (primarily frozen) increased from 8,300 t in 1974 to 108,500 t in 1983, largely owing to the high-seas catch decline, growth in salmon demand by increasingly affluent consumers, and fluctuating exchange rates. For example, 1978 salmon imports more than doubled from 1977 because a strong yen made U.S. salmon purchases less expensive. Also, Japanese importers were concerned about future salmon supplies which seemed uncertain after the Soviet Union reduced Japan's salmon catch quota 32 percent (20,100 t).

As a result of the increased imports, Japan accumulated large inventories of frozen salmon in 1979, which overlapped into 1980, causing a 30 percent decrease in salmon imports. Then, during 1981 and 1982, salmon imports increased nearly 130 percent (from 48,700 t to 117,700 t) as domestic demand increased.

In 1983, Japan's salmon imports again decreased (to 108,500 t) as a result of the record domestic catch. This 1983 "glut" also depressed Japan's salmon prices 30-40 percent in the wholesale market, and by 20 percent in the retail market. Preliminary FAO estimates[2] forecast that Japan's 1984 imports of frozen salmon would be 70,000-75,000 t, a 30 percent drop from 1983 imports, which would adversely impact many U.S. salmon exporters.

Japan imports more salmon from the United States than from any other country (Table 7). Their 1983 imports totaled over 96,000 t, and accounted for 90 percent of Japan's total salmon imports by quantity. Frozen salmon was the largest commodity imported (86,700 t), followed by salmon roe (8,175 t), fresh salmon (1,272 t), and canned salmon (93 t).

The United States was the largest sup-

Table 7.—Japan's salmon imports by commodity and country, 1977-84.

Commodity and country	Imports (t) 1977	1978	1979	1980	1981	1982	1983	1984
Fresh								
United States	50	27	74	6	38	206	1,272	5
Norway				2	29	33	78	179
Other countries	5	15	6	6	428	6	7	69
Subtotal	55	42	80	14	495	245	1,357	253
Frozen								
United States	14,834	40,833	48,030	33,019	60,212	93,063	86,669	80,271
Canada	3,706	7,053	4,720	2,641	5,157	10,834	3,837	5,178
Taiwan	31	5					3,687	2,413
North Korea	662	1,808	1,382	1,674	3,002	1,501	1,188	1,661
South Korea	12	7	25	6	359	1,362	1,928	1,982
U.S.S.R.			439	1,991	2,546	645	254	1,363
Other countries	34	32	15	1	65	73	283	110
Subtotal	19,279	49,738	54,618	39,331	71,341	107,478	97,848	92,978
Cured								
United States							7	695
Canada							121	563
North Korea							17	10
Subtotal							145	1,268
Roe								
Cured[1] (sujiko)								
United States	5,554	6,319	6,799	7,403	9,509	8,596	8,098	8,544
Canada	1,110	1,474	983	1,154	1,190	982	648	629
Other countries	18	10	9	43	33	59	36	33
Subtotal	6,682	7,803	7,791	8,600	10,732	9,637	8,782	9,206
Cured[1] (ikura)								
United States	80	35	50	50	10	2	77	19
Canada	4	2	9	negl.	2	negl.	4	2
China	32	17	8	3				
Other countries	5	7	9	1	1	negl.	1	5
Subtotal	121	61	76	54	13	2	82	26
Canned								
United States	214	213	1,547	345	294	121	93	20
U.S.S.R.	60	1	390	415	203	112	117	137
Canada	1	60	232	29	61	87	65	41
Other countries	negl.	negl.	1	1	3	1	2	4
Subtotal	275	274	2,170	790	561	321	277	[2]202
Grand total[3]	26,412	57,918	64,736	48,789	83,142	117,685	108,491	103,933

[1]"Sujiko" is cured roe in the skein. "Ikura" is cured roe separated from the skein.
[2]Japan's canned salmon imports were only available from January through November 1984.
[3]Totals may not agree because of rounding.

[2]FAO, "Infofish Trade News" (84/11), 16 June 1984.

Table 8.—Japanese imports of salmon products from the United States, by species, 1977-84.

Species	Imports (t)							
	1977	1978	1979	1980	1981	1982	1983	1984
Sockeye	N/A[1]	N/A	N/A	N/A	42,387	55,226	71,664	56,468
Chum	N/A	N/A	N/A	N/A	6,564	8,251	6,069	6,261
Chinook	N/A	N/A	N/A	N/A	2,548	1,432	2,465	1,172
Pink	N/A	N/A	N/A	N/A	1,061	12,876	1,556	10,167
Other[2]	N/A	N/A	N/A	N/A	16,303	22,503	12,729	11,920
Total[3]	15,594	41,418	44,596	30,914	68,863	100,288	94,483	85,988

[1]N/A = Not available.
[2]Unidentified salmon species; includes canned and filleted products and salmon roe.
[3]U.S. and Japanese trade statistics do not agree (i.e., 1983 U.S. Department of Commerce trade statistics indicate that the U.S. exported 94,483 t of salmon to Japan; Japanese trade statistics, however, showed U.S. exports of 96,217 t).

plier of fresh salmon to Japan in 1983, accounting for 1,272 t, or 93.8 percent of the total (Table 7). Norway was the second largest supplier (but of Atlantic salmon, *Salmo salar*), providing 77.5 t, or 5.7 percent of the total. Preliminary Japanese trade statistics through May 1984 indicated that Norway had already exported almost 94 t of fresh Atlantic salmon to Japan, 20 percent more than in 1983. Observers believe that Norway's farmed Atlantic salmon exports to Japan will continue to compete with U.S. fresh Pacific salmon exports.

Sockeye or red salmon has been the leading U.S. species imported by Japan in recent years (Table 8). In 1983, the sockeye accounted for over 75 percent by quantity and 70 percent by value of U.S. salmon shipments to Japan.

U.S. salmon exporters were not greatly affected by Japan's record salmon hatchery returns in 1983. U.S. shipments totaled over 96,000 t in 1983, a decline of only 5 percent from the nearly 102,000 t exported in 1982 (Table 7). This is because Japan released and harvested mostly chum salmon and not sockeye salmon—the primary U.S. export species.

Concern among U.S. salmon exporters may develop, however, if Japan expands hatchery efforts on sockeye salmon. In 1983, the JFA released 61,000 sockeye fry, and observers reported that the JFA planned to hatch and release 100,000 sockeye fry by 1985. If the sockeye returns are successful, the JFA may increase such releases in the future.

Exports

Japan enjoyed a favorable balance of trade in salmon products until 1976 (Table 2). However, salmon product exports have since declined (Fig. 2), especially in 1977 after the Soviets decreased Japan's high-seas catch quota. Expanded domestic salmon demand in recent years also contributed to the export reduction.

Both in 1982 and 1983, Japan exported less than 1,000 t of salmon products. However, Japanese trade statistics through May 1984 indicated that Japan's early 1984 salmon exports (1,000 t) had already exceeded 1983 exports, which observers indicate was due to the 1983 over-supply of salmon on the Japanese market.

Conclusions

The factors which continue to influence Japan's salmon supply include: 1) Coastal (hatchery-produced) chum catches, 2) salmon imports, and 3) high-seas catches. Japan must carefully balance these factors to meet the domestic demand while not over-supplying the market (as in 1983).

The high-seas catch represents an especially difficult problem since it depends on annual bilateral quota agreements with the Soviet Union. Japan has tried to convince Soviets to agree to a long-term salmon agreement that would assure economic stability for Japanese high-seas salmon fishermen and also assure domestic markets a specified portion of the total salmon supply for several years. So far the Soviets have been unwilling to agree to this proposal.

Japan will remain the largest foreign market for U.S. salmon exports. The amount of U.S. exports will depend, however, upon Japan's domestic demand for salmon. Some observers believe that Japanese consumers are developing a greater affinity for U.S. sockeye over the traditionally favored chum. Salmon prices will also influence U.S. exports, since the typical Japanese consumer is price-conscious about seafood.

Japan's salmon catches (both coastal and high-seas) will also influence U.S. exports. Furthermore, if Japan's high-seas salmon quota is reduced in the future, U.S. salmon exports would probably increase. (Source: IFR-84/79B.)

Status of Mexico's Fisheries, 1983-84

Mexico's Fisheries Secretary Pedro Ojeda Paullada has announced that the Mexican Government's goal is to more than double the 1983-84 fisheries catch of 1.1 million metric tons (t) (data adjusted for the period 1 Sept.-31 Aug.) to 2.5 million t by 1988. While the 1983-84 harvest was less than in previous years (Table 1), the apparent decline probably reflects more accurate statistical reporting and the lingering results of the of the 1982-83 El Niño on the important Pacific Coast small pelagic fisheries . Secretary Ojeda's remarks came in a late 1984 briefing of the Mexican Congress on the status of the fisheries.

Mexico has a mixed economy and the three major economic sectors (private, cooperative, and public) each play an important role in the fishing industry. The private sector takes the largest quantity of fish, about 66 percent during 1983-84. Most of the private catch

Table 1.—Mexico's fish catch, recent and projected (1938).

Year[1]	Catch (1,000 t)
1975	467.5
1976	526.3
1977	610.8
1978	702.6
1979	877.0
1980	1,243.6
1981	1,564.8
1982	1,506.0
1983-84[2]	1,100.0
1988	2,500.0

[1]Calendar year.
[2]Sept.-31 Aug.

is small pelagic species which are reduced to fishmeal and oil. The cooperative sector only takes 25 percent of the country's fisheries catch, but because that includes shrimp, lobster, abalone, and other valuable species, the cooperatives account for the largest share of the catch value. The publicly owned state companies only account for about 9 percent of the catch in terms of quantity, but almost all is of edible species, and as a result state companies play an important role in supplying foodfish to the domestic market. The Secretariat of Fisheries (SEPESCA) hopes to more than double the catch of the state corporations by 1988. The state companies also play a critical role by helping the cooperatives export their shrimp catch to the United States and other foreign markets.

The state companies, Productos Pesqueros Mexicanos (PPM) and Industrias Pesqueras Paraestatales del Noroeste (IPPN) play a more important role in processing the country's catch. Mexico has 421 processing plants. Most are operated by private companies which, combined, process about 57 percent of Mexico's catch. Even so, the state companies operate the largest and most modern plants, processing about 42 percent of the total catch, but a much larger portion of edible species. The proportion of the catch processd by the state companies should increase sharply when PPM has its large new plants at Lerma (Campeche) and Topolobampo (Sonora) operating at full capacity. Cooperative plants only account for about 1 percent of production, processing almost entirely shellfish. In recent years, SEPESCA has experimented with joint ventures, allowing both private investors and cooperatives to participate in some of the PPM and IPPN projects.

The Secretary commented on the record 90,000 t 1983-84 shrimp catch, which he said demonstrated the validity of the Government's cooperative policy. Some observers, however, believe that climatic conditions may have been even more important. He also stressed that the country's fisheries catch would have been much higher had not the El Niño event affected Pacific Coast small pelagic fisheries.

The Secretary gave special attention to freshwater fisheries and aquaculture. The 1983-84 aquaculture and freshwater fisheries catch totaled 122,000 t, mostly tilapia, carp, catfish, trout, oyster, and freshwater shrimp. SEPESCA hopes to triple production to nearly 390,000 t by 1988. Mexico currently has 33 aquaculture centers and 4 hatcheries producing fry and postlarval shellfish.

Secretary Ojeda also reviewed many of the special initiatives of the current Administration, discussing administrative decentralization, intersectorial coordination, scientific investigation, training, finances, and simplifying government regulations. (Source: IFR-84/95.)

The U.S. Regional Fisheries Attache in Mexico City has also prepared a 9-page report on the Mexican fishing industry, including statistical appendices and a list of fishery cooperatives. The report can be purchased for $13.00 by ordering report PB85-114189 from NTIS, 5285 Port Royal Road, Springfield, VA 22161.

Japan and China to Produce Clams

Plans were announced earlier this year for two Japanese companies to process short-necked clams in China and import the market-ready products and sell them under an agreement of compensatory trade later in 1985. The clams were to be produced at a freezer factory in Lianoning Province in northeastern China, with the two Japanese companies furnishing processing equipment and necessary materials and technology for the vacuum sealing and heat sterilization methods. The clams were to be packed in 300 g packages and initial production was expected to be over 50 t per month.

Note: Unless otherwise credited, material in this section is from either the Foreign Fishery Information Releases (FFIR) compiled by Sunee C. Sonu, Foreign Reporting Branch, Fishery Development Division, Southwest Region, National Marine Fisheries Service, NOAA, Terminal Island, CA 90731, or the International Fishery Releases (IFR) produced by the Office of International Fisheries Affairs, National Marine Fisheries Service, NOAA, Washington, DC 20235.

Mexican Shrimping Costs, 1985

The U.S. Regional Fisheries Attache (RFA) in Mexico City, Charles Finan, has obtained a report from the Mexican Federation of Fishery Cooperatives assessing the costs of shrimp fishing in Mexico (Table 1). The costs are based on the operation of a 75-foot steel-hulled shrimp trawler, and the report is the most complete and up to date study available on the cost of shrimp fishing in Mexico. It is estimated that it costs about US$9.80 to produce and process 1 kg of shrimp, but that does not include the cost of the vessel or interest charges. These costs appear to be quite high, but include all payment to cooperative members. (Source: IFR-85/34)

Table 1.—Cost analysis[1,2,3] of a Mexican shrimp trawler (1 trip).

Item	Cost in pesos (P)
Fixed costs	
Diesel Fuel (30,000 L)	P984,000
Lubricant (2 Barrels)	105,120
Food	140,000
Deck equipment	50,000
Spare parts	50,000
Freon, salt, ice	75,000
Repairs	
Fishing gear	50,000
Electrical equipment	45,000
Other equipment	110,000
Subtotal	P1,609,120
Variable costs	
Freezing and packing	187,500
Taxes (SPT-0.023)	71,875
Export duty (1 percent)	31,250
Commission to distributor (7.5 percent)	234,375
Transit and port charges	137,500
Prepayment to members	585,930
Administration	173,437
Social Security	50,000
Social quotas	50,000
Subtotal	P1,503,117
Total cost/trip	P3,112,237

[1]As of 28 May 1985, the Mexican peso traded for P254 (floating rate) to the U.S. dollar.
[2]Value of 1 kg of shrimp = P2,500.
[3]Value of an average shrimp catch of 1,250 kg = P3,125,000.