

ingly, less profitable. The normal albacore season runs from July through October, and in the spring the vessels fish for salmon.

Barrett and Mason said albacore fishermen along the west coast have expressed considerable enthusiasm about the possibilities of productive winter fishing grounds. One ship was fishing out there early this year, Mason said, "and we expect a number will go out next winter."

The scientists were at a loss to explain why one of the six chartered vessels consistently caught more tuna than the other boats fishing in the same area. "We are going to look into every aspect of what he was doing, to try to find out what made the difference," Barrett said.

Albacore Tagged

During the expedition NOAA scientists tagged several albacore with ultrasonic transmitters, tracking one fish for 24 hours. The tracking results confirmed the belief that tuna cue on the ocean thermocline, that layer of water separating the warmer, oxygen-rich surface waters from the lower, colder ocean depths.

Vessels which cast their lines above the thermocline caught fewer than one fish per 100 hooks on the line, while those whose lines passed through the thermocline caught approximately eight fish per 100 hooks. This knowledge makes it economically feasible for the U.S. albacore tuna fleet, which until now has not fished during winter months, to expand its activities into the area being studied during months when the vessels normally would be idle, reports Michael Laurs of the SWFC.

In addition to measuring the potential catch, the six vessels are making observations on oceanographic conditions, collecting data for albacore biology and fishery studies, and tagging and releasing albacore for migration and stock structure studies.

The activity is sponsored by the American Fishermen's Research Foundation, a west coast industry group, under a grant from funds managed by NOAA's National Marine Fisheries Service.

Guam, Marianas Fishery Resources Are Surveyed

The NOAA ship *Townsend Cromwell* returned to Apra Harbor, Hawaii, on 16 April after a 15-day cruise around Guam and the Northern Mariana Islands where potential fishing grounds were surveyed and primary biological production and energy flow were assessed. The cruise was the first of a series of four to assess the fisheries resources, according to Richard S. Shomura, Director, Honolulu Laboratory, NMFS Southwest Fisheries Center.

Bert Kikkawa, Chief Scientist on the cruise reported that the bathymetry was conducted around Guam, Rota Island, Tinian, Saipan, and Farallon de Medinilla at bottom depths down to 600 fathoms (3,600 feet). One interesting result of this survey was the documentation that Farallon de Medinilla is surrounded by a very large bank with relatively large level plateaus at depths ranging from 50 fathoms (300 feet) to 400 fathoms (2,400 feet). These plateaus will be sampled for bottomfish and deepwater shrimps on subsequent cruises. Bathymetric data

will be released after processing to aid local fishermen.

The biological assessment conducted during the cruise consisted of determining the abundance and distribution of the primary producers and zooplankton in their relationships to depth, light levels, and nutrient distribution.

Following the first bathymetric cruise, three biological cruises of 40 days each are scheduled. These will sample atulai (akule), tunas, bottomfishes, and shrimps along the Mariana Archipelago. The data collected on these cruises will be used to produce distributional charts and provide estimates of sustainable yields.

This series of research cruises is part of a cooperative agreement for the survey of the resources of the Mariana Archipelago that is being entered into by the Territory of Guam, the Commonwealth of the Northern Mariana Islands, and the United States (through the National Marine Fisheries Service and the U.S. Fish and Wildlife Service), according to Shomura. The *Townsend Cromwell* is commanded by Robert C. Roush.

Foreign Fishery Developments

Japan and Russia Sign Salmon Catch Quota Pact

Japan and the Soviet Union signed, on 23 April 1982, protocols on Japan's salmon catch quota for 1982 in the

northwest Pacific Ocean. Japanese Charge d'Affaires Hisashi Owada and the Soviet Fisheries Minister Vladimir M. Kamentsev signed the protocols at the Fisheries Ministry in Moscow.

The agreement set the 1982 Japanese catch quota for salmon at the same amount, 42,500 metric tons, as in 1981. The fishing period, the restricted fishing zones, and fishery cooperation fee of ¥4 billion (\$16 million) for 1982 remained also unchanged from 1981.

The two countries reached agreement on the salmon catch on 22 April in an unusually short period of 10 days. Both Owada and Kamentsev expressed satisfaction with the early conclusion of their negotiations. (Sources: LSB 82-6 and FFIR 82-8.)

Note: Unless otherwise credited, material in this section is from either the Foreign Fishery Information Releases (FFIR) compiled by Suneo 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) or Language Services Biweekly (LSB) reports produced by the Office of International Fisheries Affairs, National Marine Fisheries Service, NOAA, Washington, DC 20235.

The Expansion of the Mexican Tuna Fleet, 1981-1984

Mexico is building one of the world's largest and most modern tuna fleets. The NMFS Division of Foreign Fisheries Analysis estimates that by the end of 1983, Mexico will have a fleet of 113 tuna vessels with a combined carrying capacity of nearly 90,000 tons¹. Most of the newly built vessels will be purse seiners and will give Mexico the world's second largest fleet of tuna purse seiners.

Only the United States, with a 1981 fleet of 129 tuna purse seiners, has a larger fleet. Mexico's expansion of its tuna industry is an important part of its ambitious fisheries development program. Some Mexican observers, however, have now begun to question the fleet expansion program and believe that it may prove to have been a costly mistake.

Construction Plans

Mexico has launched the most ambitious fleet expansion program in the history of the eastern Pacific tuna fishery; it began to increase its tuna fleet significantly in 1980 when approximately 20 purse seiners were added (Table 1). An even larger increase is planned for 1982 and 1983. The Mexican Government and private companies have contracted for the construction of an estimated 66 tuna vessels in at least 16 different shipyards, both in Mexico and abroad (Table 2). The total cost of the vessels currently under construction exceeds

an estimated \$525 million², excluding financing (Table 2).

Shipyard Orders

The NMFS Division of Foreign Fisheries Analysis has obtained information on most of the orders placed by Mexico for tuna purse seiners and other vessels which could be used in the tuna fishery. The following shipyards were building vessels for Mexico as of January 1982. These summaries are based on a variety of press sources, often incomplete and sometimes contradictory. As a result, the actual figures may be slightly higher or lower, but they give an idea of the magnitude of Mexico's program to expand its tuna fleet.

Canada

Bel-Aire Shipyards Ltd.³ of North Vancouver, B.C., is building two purse seiners for the Mexican firm Atunero Coinseco of Mexico City. Each vessel will be 69 m long with a carrying capacity of about 1,300 tons. The vessels will cost \$8 million each; delivery is scheduled for December 1982.

Italy

The Societa Esercizio Cantieri (SEC) shipyard in Viareggio is building three tuna purse seiners for the Mexican firm Tuna del Pacifico. Each seiner

²All values are reported in U.S. dollars unless otherwise specified.

³Mention of trade names or commercial firms does not imply endorsement by the National Marine Fisheries Service, NOAA.

Table 1.—Mexico's tuna fleet, 1975-1984, by number and type of vessels and carrying capacity (cap.) in short tons.

Year ¹	Seiners		Baitboats		Total	
	No.	Cap.	No.	Cap.	No.	Cap.
1975	20	3,709	2	270	22	3,979
1976	25	13,860	2	270	27	14,130
1977	24	13,798			24	13,798
1978	23	13,437	2	174	25	13,611
1979	25	14,622	3	405	28	15,027
1980	46	35,162	6	705	52	35,867
1981	² 45	² 33,358	² 10	² 1,133	² 55	² 34,491
1982	³ 62	³ 53,458	³ 16	³ 2,033	³ 78	³ 55,491
1983	³ 91	³ 86,458	³ 22	³ 2,933	³ 113	³ 89,391
1984	³ 93	³ 87,958	³ 26	³ 3,533	³ 119	³ 91,491

¹The number cited refers to the fleet at the end of the year

²P = Preliminary

³E = Estimated based on current or planned construction.

Table 2.—Estimated cost and capacities (short tons) of tuna vessels under construction for Mexican owners as of January 1982.

Country	Type of vessel	No. of vessels	Carrying capacity	Cost ¹ (10 ⁶ US \$)
Spain	Seiner	² 21	² 25,200	² 225.0
Mexico	Seiner	14	13,200	³ 147.8
	Baitboat	16	2,400	⁴ 16.0
Italy	Seiner	7	8,400	64.5
U.S.	Seiner	4	5,200	32.8
Canada	Seiner	2	2,600	16.0
Norway	Seiner	2	2,400	23.2
Total		⁴ 66	⁴ 59,400	⁴ 525.3

¹The February 1982 peso devaluation has substantially increased the peso cost of the vessels as the contracts with foreign shipyards were denominated in dollars.

²Estimated. Some reports indicate vessel cancellations; others suggest additional orders.

³The contracts with Mexican shipyards were denominated in pesos. The Division has used the old exchange rates to estimate the cost of the vessels. Unless the contracts are revised, however, the state-owned shipyards building the vessels will suffer significant losses as many of the engines and much of the equipment are imported and the peso cost of these items has doubled as a result of the February 1982 devaluation.

⁴Estimated.

will have a carrying capacity of 1,200 tons. The seiners will cost about \$9.5 million each and are scheduled for delivery to private Mexican owners in 1982 and 1983.

Campanella Cantieri Navali shipyard in Savona is building four tuna purse seiners for four different Mexican companies (Pesquera del Noroeste, Atun del Noroeste, Pesquera Atuneros del Pacifico, and an unknown company). The vessels, similar to those being built by SEC, will

¹Carrying capacities in this report are expressed in short tons (2,000 pounds).

cost about \$9 million each and will be delivered in 1982 and 1983.

Japan

Unspecified shipyards in Japan are building 10 longline vessels for Mexico's large state-owned fishing company Productos Pesqueros Mexicanos (PPM). These are the first longliners to be built for Mexico, and they will be the first such vessels to be deployed in Mexican waters by a wholly-owned Mexican company. The vessels are capable of tuna fishing but will reportedly be deployed in the shark fishery.

Mexico

Astilleros Rodriquez, S.A. (ARSA), a subsidiary of the Mexican Government's National Shipbuilding Company, Astilleros Mexicanos (Astimex), is building 16 baitboats (*Delfin* series) for PPM. The vessels will have carrying capacities of 150 tons each. Thirteen are being built at ARSA's Ensenada yard and three at the Santa Rosalia yard, both in Baja California. PPM will probably lease the vessels to cooperatives.

Construcciones Navales de Guaymas (Conagusa), located in Guaymas, is another Astimex subsidiary. It is

building 16 tuna purse seiners (*Atun* series), each of which will have carrying capacities of 750 tons and will be 55 m long. Twelve are being built for PPM which obtained financing from Mexico's Banco Nacional Pesquero y Portuario (Banpesca), the state-owned fisheries development bank. Four of the twelve PPM seiners have already been delivered; the other eight will be delivered in 1982 (two), 1983 (four), and 1984 (two). The remaining four vessels were ordered by private Mexican companies (Pesquera Mar Atun and Pesquera San Martin) and an unknown company in Senegal. The seiners for the private Mexican companies have already been delivered at \$5.2 million each.

Mexican Naval Shipyards in Salina Cruz (Yard Number 1) and Tampico (Yard Number 8) are building six tuna purse seiners for PPM. An American company based in San Pedro, Calif., Rados International Corporation, is providing technical assistance. Three seiners will be built at Salina Cruz, and the other three at Tampico. The vessels will be 71 m long and will have carrying capacities of 1,200 tons.

Norway

Heelesoy Skipsbyggeri has received an order for the construction of two

tuna seiners for the Mexican company Pesquera Santa Ursula. Each vessel will be 69 m long and will have a carrying capacity of 1,200 tons. They are being built at a cost of \$11.6 million each and the Norwegian Government is reportedly providing low interest financing. The two vessels are scheduled for delivery in December 1982 and April 1983.

Spain

Over half of Mexico's foreign orders for tuna seiners have been placed with Spanish shipyards. The Spanish Government is eager to assist their shipyards in obtaining foreign orders and the Banco Exterior de Espana has provided Mexico with some low interest credits to finance fishing vessel construction.

Maritima de Axpe in Bilbao is building seven tuna seiners⁴ for Maratun, Tunamex, and Tunaoro. Each vessel will be 71 m long with a carrying capacity of 1,200 tons and will cost approximately \$10.6 million each. They are scheduled for delivery in 1982 and 1983. The vessels for Maratun will be some of the best equipped seiners in the Mexican fleet as they are being equipped for satellite fishing.

Maritima de Musel in Gijon has been contracted by Mexican investors to construct four tuna purse seiners (*Aleta* series). Banpesca is financing the purchase for Compania Mexicana de Tunidos and Pesqueras del Pacifico (two seiners each). The seiners will be identical to those being built by Maritima de Axpe and will also be delivered in 1982 and 1983. The first of the four vessels, *Aleta Amarilla*, has already set sail for Mexico.

Mexican investors have also reportedly ordered 10 more tuna seiners from other Spanish shipyards. Information on these orders is contradictory and fragmentary. The vessels reportedly

Norway-EEC Agree on Herring Quotas

Norway and the EEC have agreed to revised herring quotas for 1982. At the spring negotiations in Oslo, the EEC commission doubled the herring quotas which Norwegian fishermen can catch in the waters west of Scotland, bringing the total catch up to 12,000 metric tons (t) which is worth US\$5 million. In addition, Norway was allocated a herring quota of 2,000 t which is to be fished south of the English Channel.

The information officer in the Ministry of Fisheries, Trond Wold, says that the EEC has in addition given its

approval to a continuation of the brisling quota (60,000 t this year for Norway) until 12 January 1983.

In return, Norway has agreed to a quota of 3,000 t of cod, 3,000 t of haddock, 500 t of coalfish, and 350 t of shrimp in the North Sea, as well as 500 t of Norway haddock, to be fished in the Norwegian economic zone north of the 62nd parallel. The Norwegian allocation is also a compensation for the increased quota of blue whiting which Norway was granted by the EEC earlier this year. Norwegian fisheries authorities have expressed satisfaction over the agreement with the Common Market. (Source: Norwegian Information Service.)

⁴Unconfirmed reports suggest that the Axpe order may be modified. One report indicated that from one to three additional seiners may have been ordered. Another report claims that the original order has been cut back to only five seiners.

cost about \$11 million each. Delivery is scheduled for 1982 and 1983.

United States

U.S. shipyards are generally recognized to be the world's leader in the construction of tuna purse seiners. Many Mexican investors have a preference for U.S.-built vessels. U.S. shipbuilders, however, have had difficulty signing contracts with Mexican companies because of low interest financing made available by some foreign countries to attract orders for their domestic shipyards. U.S. shipyards have, nevertheless, won orders from some private Mexican investors.

The Bender Shipbuilding Company, Mobile, Ala., is building four 1,200 ton tuna purse seiners for various Mexican concerns. Two of the vessels, *Bruja del Mar* and *Bucanero*, have already been delivered to two Mexican companies, Atunera La Tris and Atun del Caribe respectively. The remaining two seiners currently under construction are for another company, Atuneros del Golfo y Pacifico, and should be delivered in 1983 at a cost of \$8.4 million each.

Marco in Seattle, Wash., is building the last three 33 m purse seiners for Mexico, out of a nine vessel order. The purchase is being financed by Banpesca. Each vessel has a carrying capacity of 200 metric tons. The refrigeration units that are being installed can be used either for the tuna or the sardine fishery. It is likely that these vessels will be used in the sardine fishery as Mexico's current tuna fleet is already supplying more tuna than Mexico can utilize. All nine vessels are to be delivered to an unknown company in Mazatlan.

The Tacoma Boatyard, Tacoma, Wash., is building two 75 m tuna purse seiners for the Mexican Government. Each vessel will have a carrying capacity of 1,400 tons and cost \$8 million. The delivery dates were May and June 1982, but the Mexican Government reportedly asked Tacoma Boatyard to delay delivery until late in 1982, as a result of a foreign exchange shortage caused by the February 1982 devaluation of the peso.

Types of Vessels

Most new tuna vessels ordered by Mexico are large tuna purse seiners. It is not known why the Mexicans chose to base the expansion of their tuna fleet primarily on these large seiners which are the most expensive type of vessel available for tuna fishing.

Large, modern purse seiners employ a relatively small number of fishermen and can operate at great distances from their ports. As a result, even though they may be costly to build, they are efficient fishing vessels for countries with high wage rates located at great distances from the fishing grounds. Mexico has, however, generally low wage rates, a severe unemployment problem, and several ports located near grounds which, in recent years, have been some of the most productive in the eastern tropical Pacific.

Tunas are highly migratory and in recent years, yellowfin and skipjack tuna schools in the eastern tropical Pacific have appeared off Mexico in significant quantities. This could change, however, because of the migratory nature of tuna and the great annual variations in its appearance. In previous years, tunas have appeared in larger quantities off Central and South America.

Many Mexican investors were reportedly impressed by the modern U.S. seiners which used to land tuna at Ensenada. This may have influenced the decision of some of the investors which ordered the seiners. Mexican officials may also have wanted vessels capable of fishing outside their claimed 200-mile Exclusive Economic Zone (EEZ). Some Mexican observers are now questioning the decision to concentrate on seiners, but as most of the seiners are already under construction it is too late to change the decision to build a major seiner fleet.

Mexico has not restricted its tuna fleet expansion program exclusively to purse seiners. Some longliners and baitboats are also being built. Mexico has ordered 10 longliners from Japan, but they will, reportedly, be deployed in the shark fishery. One longline vessel, however, is doing experimental tuna longlining in the Gulf of Mexico. Joint ventures along the Pacific coast have been formed with Japanese and Korean companies which make detailed reports to the Mexican Government on the quantity and composition of their catch. The catch of these joint ventures, however, is mainly billfish.

Mexico also plans to expand the baitboat fleet. Sixteen baitboats are be-

JAPANESE 1981 SURIMI PRODUCTION UP 6 PERCENT

Japanese frozen surimi (minced fish) production during January-December 1981 amounted to 306,657 metric tons (t), up 6.1 percent from the 1980 figure. Of this quantity, 192,264 t or 63 percent consisted of factoryship-processed production (motherships and large trawlers) and 114,393 t or 37 per-

cent, land-based production. When compared with 1980, the 1981 production of factoryship-processed surimi increased 4.9 percent and production of land-based surimi increased 8.3 percent. The trend in the production of frozen surimi for 1972-1981 is shown below in Table 1. (Source: FFIR 82-6.)

Table 1.—Japanese frozen surimi production, 1972-81, metric tons.

Year	Factoryship	Land-based	Total	Year	Factoryship	Land-based	Total
1972	193,500	161,200	354,700	1977	168,823	191,769	360,592
1973	223,600	159,100	382,700	1978	183,012	132,433	315,445
1974	195,300	152,800	348,100	1979	180,401	114,425	294,827
1975	191,200	166,000	357,200	1980	183,232	105,668	288,900
1976	187,000	198,000	385,000	1981	192,264	114,393	306,657

ing constructed in Mexican shipyards for PPM. Some observers believe that these smaller, more labor-intensive baitboats could prove to be the most efficient vessels for the Mexican tuna industry, especially if they were owner operated. PPM reportedly plans, however, to lease the new baitboats to cooperatives. As a result, many observers, who have little confidence in the cooperatives, are skeptical about the baitboats.

Number of Vessels

Mexico's decision to build so many new tuna vessels is difficult to explain. Many Mexican observers, both Government officials and private investors, now consider it to be a serious mistake, and newspaper articles criticizing the Government's tuna policy have begun to appear.

The massive build-up of the Mexican fleet is the largest and the most rapid in the history of the eastern Pacific tuna fishery, despite Mexico's cutting back on its original plan. The Mexican Secretariat of Fisheries had initially planned on a tuna fleet of 150 large seiners. In an October 1981

meeting with tuna industry leaders, Mexican Fisheries Secretary Fernando Rafful announced that the tuna fleet, however, should not exceed 100-120 seiners. It now seems likely that the Mexican tuna fleet will be limited to the lower level of 100 seiners.

The number of vessels Mexico is adding to its fleet is clearly not justified by the quantity of tuna available in Mexico's 200-mile EEZ. The entire international seiner fleet only caught an average 87,800 tons of tuna per year in the Mexican EEZ during 1977-81 when tuna abundance off Mexico was at record high levels. This means that, theoretically, all of the tuna available in the Mexican EEZ could be caught in one trip by Mexico's new tuna fleet. Most Mexican tuna seiners, however, make three to four trips per year and thus the planned 1983 fleet will have the theoretical capacity of catching over 270,000 tons of tuna annually. (Based on the actual performance of Mexican tuna fishermen, however, the country's 1983 fleet could realistically be expected to catch about 150,000 tons of tuna, still substantially more than is available in the EEZ.) The tuna

available in the Mexican EEZ could thus be fully utilized by a tuna fleet much smaller than the one Mexico is building.

To justify such a massive increase in its tuna fleet, the Mexican Government must have planned on fishing off other Latin American countries. A catch averaging 88,000 tons per year will not support a fleet profitably with a carrying capacity in excess of 90,000 tons. The huge number of new vessels Mexico is adding to its fleet is probably not even justified by the tuna available in the entire eastern Pacific Ocean.

Most biologists believe that the yellowfin tuna stocks, the most important tuna species in the eastern Pacific, are already overfished and that the impact of the greatly expanded fishing effort planned by Mexico is impossible to project. Yellowfin tuna yields have been declining for years, and many fishermen do not believe that they can continue fishing profitably for long if yields continue to decline. While yellowfin yields in the eastern Pacific as a whole have been declining, the decline has been much less severe in the northern area of the fishery off Mexico. It is likely that the increased Mexican effort will further impair yellowfin tuna catch rates, making the fishery even less attractive for U.S. and other foreign fishermen operating in the eastern Tropical Pacific.

Vessels

The total cost of the tuna vessels Mexico is currently building exceeds an estimated \$0.5 billion, excluding financing (Table 1). The cost of financing and fully equipping these vessels could bring their total cost to almost \$1 billion. Most of the vessel construction loans are for a 10-year period with interest rates running 7 to 11 percent. Banpesca charges an additional 1.8 percent charge for processing and guaranteeing the loans. Most of the new vessels are being financed through Banpesca, either with direct loans or with loan guarantees. This means that if the private owners cannot meet their payments, the Mexican Government is obligated to repay the loans. The only seiners being built without Banpesca

Norway's Fishing Fleet Growth Slowing Down

The Norwegian fishing fleet will receive only about 100 new vessels this year and this is much fewer than has been customary in recent years. The number of new vessels begun in the category 40-80 feet is expected to be halved from 20 to 10, and no new vessels of over 80 feet will be built, states Arnulf Midtgaard, director of the state fishermen's bank.

This is an unsatisfactory development for the over-40-foot category but there has been a strong renewal of the category 30-40 feet. Midtgaard said that the average age of large vessels has reached 20-30 years and this is too high. Although the interest for investment in the fishing fleet has declined, there is still such a large number of applications that they correspond to an amount three times as high as the loan

frame within which the bank operates. The loan frame this year is US\$38.6 million and of this US\$8.3 million goes to new vessels, US\$14 million to conversions, and US\$6.6 million in connection with the sale and purchase of second-hand vessels.

The Ministry of Fisheries has instructed the bank to limit loans to vessels of 30-40 feet and reduce the number from 120 annually in the previous 2 years, to under 100 this year.

A vessel of 60-70 feet costs about US\$833,000 and today it is impossible to pay the interest on this amount through investment in a fishing vessel. There are few who have private capital which can make it possible to acquire a vessel of this size, Midtgaard said. (Source: Norwegian Information Service.)

funds or loan guarantees are the ones under construction by Bender and the Tacoma Boatyard in the United States.

Economic Implications

The economics of the Mexican tuna industry have changed radically since 1979 and 1980 when many investors, some with no prior fishing experience, rushed into what they thought would be a lucrative new fishery. Many observers now believe that the Mexican tuna industry may require massive Government subsidies. Many private companies, already in the tuna industry, are now asking the Mexican Government for assistance. The new companies whose tuna seiners are still being built may require even greater financial aid following the devaluation of the Mexican peso.

The February 1982 decision by the Mexican Government allowing the peso to float has adversely affected the companies which ordered seiners in foreign shipyards. In just a few days, the Mexican peso fell from 23 pesos per US\$1 to 45 pesos per US\$1. The devaluation effectively doubled the peso value of the 36 seiners ordered abroad from 8.3 to 16.3 billion pesos, since all contracts with foreign shipyards were denominated in U.S. dollars. If Mexico were successfully exporting most of its tuna, the impact of the devaluation would be less severe because the dollar earnings could be used to repay the loans. But Mexico is marketing most of its tuna domestically. About 55,000 tons of Mexico's 76,000-ton 1981 tuna catch was marketed domestically. The earnings from such domestic sales are in the now devalued pesos. Mexican companies are faced with a serious dilemma. They will need to increase the domestic price of tuna to repay the dollar-denominated foreign loans. A substantial domestic price increase, however, would adversely affect sales and diminish the already inadequate domestic market.

The 1980 U.S. tuna embargo⁵ has denied Mexican tuna companies access to the world's largest tuna market. Mexican companies have had difficulty finding alternative foreign markets. Much of the tuna that Mexico has

been able to export has reportedly been sold at prices well below those prevailing in the United States. Tuna fishermen have been forced to rely on Mexico's small, domestic market for tuna. This has radically reduced their planned profits.

The prices available for tuna to Mexican tuna fishermen have declined sharply, and it is not yet clear at what level the Mexican Government will support those prices. Until the U.S. tuna embargo, Mexican fishermen could sell their catch to the United States where, in 1980, premium grade yellowfin tuna averaged \$1,184 per ton, while the premium grade skipjack tuna averaged \$1,082 per ton. Throughout most of 1981, massive purchases by state-owned Mexican canneries maintained domestic prices near U.S. levels, guaranteeing profitability to Mexican tuna fishermen. Mounting stocks of unsold canned tuna, however, have forced Mexican canneries, including the state-owned ones, to reduce or suspend tuna purchases in late 1981. As a result, tuna prices declined sharply, and some tuna was reportedly sold for as little as \$600 to \$700 per ton. The fishermen and the Government are now negotiating a contract which would ensure a guaranteed price. As of April 1982, however, the agreement had not yet been finalized. The Government is reportedly concerned about the potential cost of supporting the price near the U.S. levels as the fishermen are demanding.

Mexican tuna fishermen will be able to export some of their yellowfin tuna catch, mostly to European countries, at acceptable price levels, but export sales of skipjack will be much more difficult as European importers primarily want yellowfin tuna. Italy is Mexico's primary European customer, and almost all of the shipments to Italy have been yellowfin tuna.

⁵The United States imposed the embargo on tuna and tuna products as a result of Mexico's seizure of the U.S. tuna vessels which were subsequently charged and fined for fishing for tuna in Mexico's 200-mile EEZ. The United States does not recognize coastal state jurisdiction over highly migratory species such as tuna.

Shipments to Europe will also yield profits below previous sales to the United States. The cost of shipping tuna to distant markets reduces the profits to Mexican companies. Before the U.S. tuna embargo, the tuna was simply landed in Ensenada and trucked across the border to nearby canneries in southern California.

Asian sales will be extremely difficult for Mexico. Countries such as the Philippines and Indonesia have begun to develop their skipjack tuna fisheries and, added to the already sizeable fisheries of Japan, Korea (ROK), and Taiwan, have sharply increased the quantity of skipjack tuna entering the international market. The increase has caused international skipjack prices to decline to as little as \$800 per ton in early 1982.

Prices for skipjack tuna from the western Pacific (fish over 2.5 kg) at Japan's Shimizu market, for example, declined from \$1,134 per ton in December 1981 to only \$796 per ton in early March 1982. Unconfirmed reports, however, suggest that prices may have begun to increase somewhat in early April.

The Mexican Government faces some difficult economic choices. The country has not been able to market all of its 1981 tuna catch. Massive stocks of both frozen and canned tuna are reported in the ports of Ensenada and Mazatlan. By 1983, the tuna vessels ordered by Mexico will enable fishermen to increase significantly their tuna catch. Unless Mexico is able to find sizeable new export markets (which seems unlikely), the country will have to continue to rely on its domestic market. This will require the Mexican Government to budget substantial sums to subsidize domestic tuna sales. Failure to do so could mean the bankruptcy of many Mexican tuna companies, in which case the Government, through Banpesca, would be responsible for debts exceeding \$1 billion. In addition to the tuna vessels currently under construction, Banpesca has previously financed the construction of an unknown number of tuna vessels as well as loans for the construction of cold stores and canneries for the tuna industry.