

The Fishery Exports of Latin America

Several Latin American countries are important exporters of fishery products. Chile and Mexico are the two leading countries, both with exports exceeding \$0.5 billion in 1987. Six other countries (Ecuador, Peru, Venezuela, Argentina, Brazil, and Cuba) export more than \$0.1 billion annually (Table 1). The primary products for each country include: Chile (fish meal), Mexico (shrimp), Ecuador (shrimp), Peru (fish meal), Venezuela (tuna), Argentina (hake), Brazil (shrimp and lobster), and Cuba (lobster).

Most countries reported higher earnings in 1987, even though some countries reported catch declines, at least partially due to the 1986-87 El Niño event. Exports earnings have increased sharply in nominal dollars since 1980, but real earnings in constant 1980 dollars have increased only marginally. Declining real prices since 1980 for some of the region's primary export commodities (fish meal and shrimp) have limited real increases despite a major expansion of the fishing industry in the region. (Fish meal prices increased in 1987, but were still below 1980 levels in real dollars.)

Earnings Increase

Most countries reported sharply high-

er export earnings in 1987 relative to 1986 despite an overall decline in the regional fisheries catch. The leading exporters shipped \$2.6 billion of fishery products in 1987, a 15 percent increase over the \$2.2 billion shipped in 1986 (Figure 1, Table 1). Chile's export earnings increased by nearly \$100 million despite a sharp decline in small pelagic catches. Improved fish meal prices and rising production in a variety of other fisheries enabled Chilean exporters to achieve record results (Table 1). Mexican export earnings increased by nearly \$125 million because of near-record shrimp catches in their important Pacific coast fishery. Ecuador's export earnings increased by about \$70 million because of massive increases in pond shrimp harvests. Ecuador replaced Mexico as the primary supplier of shrimp (in quantitative terms) to the United States. Peruvian earnings declined more than \$20 million, as a result of lower fish meal production. Venezuelan exports declined nearly \$50 million due to lower tuna shipments, based on official statistics. Actual results were probably better, as many Venezuelan tuna fishermen transship in Panama and other foreign

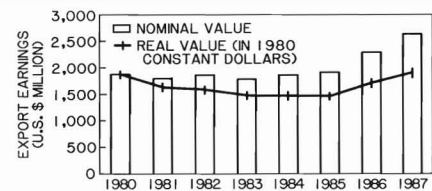


Figure 1.—Fishery export earnings of major Latin American fishing nations.

ports, to avoid the undervalued official exchange rate, and do not report all of these shipments to the Venezuelan Government. According to some estimates, more than 50 percent of the Venezuelan tuna catch may have been transshipped illegally.

Argentina reported an export increase of nearly \$85 million because of the strong market for hake and other groundfish in Europe and the United States. Brazil reported a \$20 million increase, primarily because lobster shipments increased. Cuban 1987 data is unavailable.

Nominal Earnings Increase

Most major Latin American fishing countries have increased their nominal export earnings since 1980 (Table 1). Fishermen throughout the region have significantly expanded their catch since 1980. As a result, most countries have reported substantially increased exports, both in quantity and nominal value. The \$2.6 billion worth of fishery products exported in 1987 was nearly 45 percent

Table 1.—Latin America's fishery export earnings by major fishing nation, 1980-87.

Nation	Export earnings (US\$ million)							
	1980	1981	1982	1983	1984	1985	1986	1987
Chile	323.0	326.6	386.3	419.0	419.4	438.6	516.0	615.0
Mexico	580.0	494.5	396.2	436.8	437.4	371.0	423.9	550.0
Ecuador	200.0	188.8	219.6	219.4	216.1	260.9	383.6	450.0 ¹
Argentina	143.3	139.4	190.6	168.2	157.7	149.9	183.0	267.3
Peru	320.6	298.8	282.3	145.4	233.2	221.6	256.1	235.0 ¹
Brazil	132.8	155.9	161.6	137.3	179.3	174.3	153.8	175.5
Venezuela	4.9	12.4	24.1	55.4	80.4	127.8	188.5	140.0 ¹
Cuba	123.8	120.2	146.3	157.5	84.3	118.0	123.1	N.A. ²
Uruguay	50.9	61.3	47.5	45.7	48.9	54.1	65.2	82.8

¹NMFS estimate.

²Not available.

Table 2.—Latin American fishery exports, by real value and major nation, 1980-87.

Nation	Fishery exports (US\$ million ¹)							
	1980	1981	1982	1983	1984	1985	1986	1987
Chile	323.0	296.2	329.9	346.5	332.6	336.0	387.5	445.9
Mexico	580.0	448.5	338.4	361.2	346.9	284.2	318.3	398.8
Ecuador	200.0	171.2	187.5	181.4	171.4	199.8	288.1	326.3 ²
Argentina	143.3	126.4	162.8	139.1	125.1	114.8	137.4	193.8
Peru	320.6	271.0	241.1	120.2	184.9	169.7	192.3	169.1
Brazil	132.8	141.4	138.0	113.5	142.2	133.5	115.5	127.2
Venezuela	4.9	11.2	20.6	45.8	63.8	97.9	141.6	101.5 ²
Cuba	123.8	109.0	124.9	130.3	66.8	90.4	92.4	N.A. ³
Uruguay	50.9	55.6	40.6	37.8	38.8	41.4	49.0	60.0

¹Values expressed in 1980 constant dollars. Annual figures were computed by using the following U.S. annual inflation rates: 1981, 10.3 percent; 1982, 6.2 percent; 1983, 3.2 percent; 1984, 4.3 percent; 1985, 3.6 percent; 1986, 1.9 percent; 1987, 3.6 percent.

²Estimate.

³Not available.

more than the \$1.8 billion exported in 1980. Venezuelan and Ecuadorian earnings have more than doubled since 1980, while Chile and Argentina have reported increases of about 90 percent. Only Mexico and Peru have reported declines in nominal export earnings since 1980. Cuban earnings have changed little, although data is available only through 1986. Most of the increases in nominal earnings too place in 1986 and 1987 (Fig. 1). As recently as 1985 export earnings of the major countries totaled only \$1.9 billion, only slightly ahead of 1980 exports (Table 1). The increase which began in 1986 is primarily due to the successful expansion of the pond shrimp industry in Ecuador and rising fish meal earnings. Chile, Peru, and Ecuador reported massive catch increases in 1986 and benefited from rising prices. Details on the continued expansion of export earnings in 1987 are discussed above.

Real Earnings Stable

Nominal export earnings, however, are misleading. The value of the U.S. dollar eroded substantially during the 1970's. Even during the 1980's, export trends show strikingly different patterns if earnings are calculated in constant 1980 dollars (Figure 1, Table 2). Inflation rates were particularly high in 1980 and 1981, but have been modest since 1984. During the 1980-87 period, the value of the dollar declined by nearly 30 percent. In constant 1980 dollars, four countries (Chile, Ecuador, Venezuela, and Argentina) have increased real export earnings since 1980. The aggregate fishery-export value of the region's major exporters has, however, changed little. Latin America's eight leading exporters shipped \$1.83 billion worth of fishery products in 1980, but by 1987 shipments earned only \$1.85 billion, less than a 2 percent increase. The major reason for the static pattern is that prices (in constant dollars) for some of the key products shipped by Latin American countries have declined since 1980. This is an unusual phenomenon as prices for many fishery products have increased along with—or in many cases at—rates in excess of inflation since 1980. Prices for Latin Ameri-

ca's two most important export products (fish meal and shrimp), however, have fallen sharply in real value since 1980. As a result, major production increases by many countries have generated only modest—or even negative—increases in real earnings.

Government Roles

Latin American governments play varying roles in their fishing industries. Cuba and Nicaragua have industries entirely dominated by their governments. Mexico and Peru have mixed economies. The Mexican state fishing company plays a large role and controls much of Mexico's export marketing. Peru has several state fishing companies and dominates the fish meal industry. Both countries are currently reassessing their state companies because of growing budget deficits.

Some countries have no state fishing companies (Argentina, Brazil, and Chile). Some countries have modest fishery development programs, while others have sponsored major development efforts (Mexico and Brazil). Interestingly, the major export increases (Chile, Ecuador, Venezuela, and Argentina) have occurred in the countries with the lowest levels of government involvement in the fishing industry. Notably, the three countries which have reported declining or static export earnings (Cuba, Mexico, and Peru) are the countries in which the government plays the most significant role in the fishing industry.

Markets

Most Latin American countries (especially those shipping edible product) export the largest share of their seafood products to the United States. In many cases, shipments to the United States can total 90 percent or more of the country's total fishery exports. This is particularly true for the countries exporting high-valued shellfish. As a result, major exporters like Mexico, Ecuador, Venezuela, and Brazil are heavily dependent on the U.S. market.

There are some exceptions, however. Argentina has developed diverse markets for its seafood, and its shipments to Spain, Brazil, and Nigeria have fre-

quently exceeded its U.S. shipments. Cuba is also an exception because the U.S. trade embargo prevents it from exporting to the United States. The market for fish meal and other inedible products is much more diverse than that for edible fishery products. The United States imports significant quantities, but Chile and Peru report sales to a wide variety of countries in Eastern and Western Europe and Asia. (Source: IFR-88/82.)

Sweden's Fish Catch Declines in 1986

Swedish fishermen harvested more than 200,000 t of fish and shellfish during 1986, an 11 percent decrease in quantity over the 1985 catch. Because of generally higher prices for fish in Western Europe during 1986, though, the value of Sweden's 1986 catch was higher than that of the 1985 catch. Meanwhile, seafood imports increased considerably to a new record of 86,900 t. Most of these imports originated from Denmark and Norway. At the same time, Sweden's fishery exports decreased dramatically, from 77,600 t in 1985 to 59,000 t in 1986. Sweden imported 3,600 t of fishery products from the United States in 1986, primarily salmon. Swedish purchases of U.S. crayfish, however, have shown a rapid growth, especially in 1987 when record exports are projected.

The U.S. Embassy in Stockholm has prepared a 31-page report reviewing Sweden's fishing industry. The report includes sections on catch and landings, foreign trade in fishery products, the size of the fishing fleet and number of fishermen, the market for crayfish, fish farming, market impediments, and information about the Swedish fisheries administration. The appendix includes statistical tables about Sweden's catch, by species, quantity, and value, Swedish fishery exports and imports by country and product, and Swedish aquaculture production. A listing of Swedish fisheries administrators is provided along with lists of fishery associations, importers, processors, and trade publications. The report also has a list of

Swedish and English fish names and a list of Swedish tariffs for imported fishery products. U.S. companies can obtain a copy of "Sweden's Fishing Industry, 1986" for \$12.95 and a \$3.00 handling fee (total of \$15.95, personal checks or money orders only) by ordering report PB88-115530/GBA from NTIS, Springfield, Virginia 22161. (The handling fee is per order, regardless of how many reports are ordered.)

Chileans Culture Atlantic Salmon

Chile has one of the world's fastest growing salmon culture industries. Harvests totaled about 2,000 metric tons (t) in 1987, and many experts believe that Chilean production may reach 10,000 t by 1990. The country's full potential may exceed that of Norway. Chilean salmon farmers culture primarily the coho salmon, *Oncorhynchus kisutch*, while salmon farmers in most other important salmon producing countries culture primarily Atlantic salmon, *Salmo salar*.

Some foreign groups and local Chilean companies, however, are now establishing Atlantic salmon farms in Chile. Information is available on two such operations which could have a significant impact on the development of Chile's rapidly growing salmon culture industry. Atlantic salmon command higher prices because they can be grown to larger sizes than coho, and farms could significantly increase earnings by shifting some of their production to the Atlantic species. In addition, the foreign companies entering Chile are providing valuable technical and financial input that will promote the industry's development.

U.K. Joint Venture

The Chilean company, Lever Chile¹ (a subsidiary of Unilever), began operating an Atlantic salmon farm in 1987. Culture operations at the \$10 million project are underway with an initial investment of \$5 million. The General

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

Director, David McCarthy, hopes that the project will produce 2,500 t of salmon a year by 1990, a figure which may eventually increase to 10,000 t. A team from Marine Harvest, a subsidiary of the giant British firm Unilever and a pioneer in Atlantic salmon culture, visited Chile in late 1986 and decided to initiate an Atlantic salmon project. Marine Harvest has operated salmon farms in Scotland for over 20 years and harvested 4,000 t of salmon in 1987. The experience and positive results gained there encouraged Marine Harvest to expand its operation abroad as potential new sites in Scotland are becoming scarce.

Lever Chile has imported salmon eggs from Scotland and constructed a hatchery near Lake Puyehue in Southern Chile. The imported eggs were hatched at the Puyehue facility. Some alevins have already been transferred to Lake Llanquihue, while the rest remained near Lake Puyehue. Lever Chile reports that their alevins were growing faster than the Marine Harvest alevins in Scotland, most likely because of higher water temperatures in Chile. Once the alevins mature to smolts they will be transferred to a marine-site southeast of Puerto Montt. Lever Chile estimates that the first Atlantic salmon will reach harvestable weight in 1990, although it could be earlier if the salmon continue to grow at the present rate.

The 2,500 t harvest projected in 1990 makes the Lever Chile project one of Chile's largest salmon farms. The projected Lever Chile harvest would be about 25 percent of Chile's projected salmon harvest in 1990. The technical and financial backing of Unilever provides Lever Chile support unavailable to most other Chilean salmon farms, many of which are relatively small operations.

Norwegian Joint Venture

The Swan Foundation, financed by the Norwegian Government, also started an Atlantic salmon culture project in Chile in 1986. Swan not only plans to culture salmon itself, but to sell both eggs and smolts. It could thus help many small operations in Chile to shift from coho to Atlantic salmon culture if they

so desire. The size of the project and projected production of Swan, however, are unavailable.

Several Chilean companies also plan to work with Atlantic salmon. Three companies (Chisal, Pesqueras Mares Australes, and Soc. Agricola Aguas Claras) plan to culture Atlantic salmon. Some projects have already been initiated. Other Chilean companies plan to produce eggs and smolts for sale to farmers. Domestic production of Atlantic salmon smolts and eggs will help avoid dependence on foreign suppliers and the transmission of diseases. (Source: IFR-88/25.)

Population Biology Symposium Slated

An International Symposium on Fish Population Biology has been scheduled for 17-21 July 1989 at the University of Aberdeen, Scotland, by the Fisheries Society of the British Isles in collaboration with the Marine Laboratory of the Department of Agriculture and Fisheries for Scotland. The meetings will provide an opportunity to explore the complex relationships that determine the biological state of fish populations, the organizers report, and the biology of both marine and freshwater species will be covered. Topics will include theories of fish population dynamics and stock assessment science and methodology, larval ecology and juvenile life history (relevant to recruitment to the adult population), fish stock identification and distribution, migrations, and regional variation of life history parameters, reproductive biology (in relation to genetics, growth and food availability, and much more).

For further information contact D. N. MacLennan, DAFS Marine Laboratory, P.O. Box 101, Victoria Road, Aberdeen, Scotland, AB9 8DB.

Norway Scientists to Increase Whale Research

The Norwegian Government has approved a whale research program for 1988-92 which represents a substantial increase in Norwegian whale research.

The main purpose of the program is to work out data and guidelines providing for reasonable preservation and management of the whale population in the northeast Atlantic Ocean, at a time when the mutual dependency between whales, other marine mammals and fish populations is being evaluated, reports the Norwegian Information Service, Norinform.

The main goals of the Norwegian program are: 1) To ascertain if there are separate populations of minke whales in

the North Atlantic, and if so gauge their interaction, 2) to map the minke whale's pattern of migration, 3) to gain a more precise estimate of the minke whale population and increase knowledge of other important factors that affect the whale population, and 4) to determine the importance of the minke whale population to the ecological system in the Norwegian Sea and Barents Sea.

The program is meant as Norway's contribution to the comprehensive whale population study being carried

out under the auspices of the International Whaling Commission. To carry out its program this year, Norway plans to harvest 35 minke whales this summer. But at the annual meeting of the IWC held in New Zealand in the beginning of June, Norway won no support for its research harvest quota. At the meeting, a resolution forwarded by Australia expressing doubts over the scientific basis of the plan was passed by the commission by a 14 to 4 vote, with 10 countries abstaining.

Budgeting for Fish and Fisheries in Japan

The Fisheries Agency of Japan's (FAJ) budget for fiscal year (FY) 1988, which began on 1 April 1988, was authorized at ¥329 billion (about US\$2.6 billion at the then current exchange rate). Japan's fiscal year runs from 1 April to 31 March of the next year. The exchange rates used in this report are ¥140 per US dollar for FY 1987 and ¥125 per US dollar for FY 1988. All references to FY in this report refer to Japanese Fiscal Year(s).

The FY 1988 fisheries budget was 11 percent higher than the FY 1987 fisheries budget of ¥301 billion (\$2.1 billion). The 1988 budget, while 11 per-

cent higher than the FY 1987 budget in yen terms, is almost 24 percent greater in terms of the U.S. dollar, which depreciated considerably during 1987 and early 1988. The FAJ budget accounts for about 0.6 percent of Japan's total national budget.

The 1988 fisheries budget is the largest in Japan's history, surpassing the previous record budget of ¥317 billion in FY 1982. The FAJ originally requested ¥328 billion for FY 1988, but because of a windfall of funds obtained from the privatization of the Government-owned Nippon Telephone and Telegraph (NTT), amounting to over

¥34 billion (\$272 million), the final amount was actually larger than that requested (see box).

Background

The FAJ's "General Accounts" budget consists of a "public" expenditures budget and a "nonpublic" expenditures budget (Table 1). It is often difficult to distinguish between the two types.

"Public" expenditures are monies spent for activities involving the national government directly. In a nonfishery setting, this would include such projects as road, sewer, and power plant construction (i.e., "social infrastructure" projects). In Japan, government "public" expenditures are used as economic stimuli. The fisheries "public" budget includes fishing port maintenance, shoreline preservation, and coastal fisheries promotion. Most "public" budget items are politically sensitive and it is usually very difficult to reduce spending for programs in this category.

"Nonpublic" expenditures are program oriented. Prefectural and city governments, as well as associations and private companies, share the cost of nonpublic programs with Japan's national government—often up to 50 percent. These projects are also administered by local governments and other bodies. There is some overlap between the public and nonpublic accounts. Decisions as to which account a program is assigned often depends on the national government's financial situation during the budgeting process. If national government coffers are full, both public and nonpublic accounts may benefit, but

Nippon Telephone and Telegraph Privatization

The 1987 privatization of NIT made over ¥1.3 trillion (\$11 billion) available to the Japanese Government for FY 1988. This money was to be expended in the form of interest-free loans for three different types of projects:

1) *NIT Type A Projects*: A total of ¥200 billion is earmarked for 20 year loans for public works that are expected to earn a profit. The loans will be repaid with the profits accrued from these projects and a 5-year grace period will be allowed before repayment must begin.

2) *NIT Type B Projects*: About ¥1 tril-

lion will be available for non-profit public work projects in the form of 10-year loans with 3-year repayment grace periods.

3) *NIT Type C Projects*: A total of ¥100 billion will be made available to the private companies at 15-year loans with 3-year repayment grace periods. This money must be used for projects which contribute to the enhancement of the national economy.

Note: Only ¥34 billion (US\$272 million) of the total available NIT funds (or about 2.5 percent) will be used for fishery projects.

Table 1.—Budget of the Fisheries Agency of Japan by item, year, and percent change, for 1987 and 1988.

Budgetary item	Amount and FY ¹			Budgetary item	Amount and FY ¹		
	1987	1988	Percent change		1987	1988	Percent change
General accounts				Fishery products consumption (continued)			
Public expenditures				(Loan parameters)	(5,900)	(7,500)	(+27)
Fishing ports	156,928	185,371	+18	Processing management			
Coastal fishing grounds maintenance	20,722	24,670	+19	Promotion fund	263	247	-27
Shoreline preservation	11,911	14,044	+18	(Loan parameters)	(14,000)	(14,000)	
NIT Type A projects (1988 only)		678		Other	33	13	-61
Disaster rehabilitation	790	1,226	+55	Subtotal (Proc. Impr.)	1,935	1,823	-6
Subtotal	190,351	225,989	+19	Subtotal	3,884	4,070	+5
Nonpublic expenditures				Resource development and access to foreign fisheries			
Domestic fisheries promotion				Marine Resources Development			
Master plan for promotion		31		JAMARC ³	4,942	4,758	-4
Coastal fisheries improvement	7,006	6,748	-4	Other	438	425	-3
Development of new technology	838	1,046	+25	Subtotal	5,380	5,183	-4
Fish farming	4,229	4,381	+4	Foreign fisheries cooperation			
Salmon release program	3,152	3,014	-4	International fisheries cooperation	4,000	4,000	
Aquaculture	69	347	+402	Foreign 200-mile zone development	126	207	+64
Development of offshore grounds	133	309	+132	Foreign ministry aid	9,700	10,000	+3
Resources management-minded fisheries	156	472	+203	International federation of cooperatives	21	18	-14
Inland fisheries promotion	874	868	negl.	South Pacific aquaculture	65	54	-17
Fishery coordination councils	871	835	-4	South Pacific coastal fisheries		143	
Fishery resources conservation	114	111	-3	Other	365	366	negl.
Fisheries extension				Subtotal	14,277	14,788	+4
Fisheries extension	981	986	negl.	Access to foreign fishing grounds			
Coastal fisheries improvement (Loan parameters)	(5,300)	(5,300)	-13	Resource surveys			
Fishermen's welfare	261	246	-6	Fisheries resources survey ⁴	1,068	957	-10
Subtotal	19,237	19,874	+4	North Pacific living resources	647	630	-3
Fisheries management				Distant water living resources	224	217	-3
Production restructuring				Marine debris	24	52	+117
Special programs	4,000	3,800	-5	Scientific whaling	355	515	+45
Fisheries restructuring fund (Loan parameters)	(60,000)	(60,000)	-12	Other surveys	72	40	-44
Subtotal	6,357	5,881	-7	Subtotal	2,390	2,411	+1
Emergency loans				Subtotal	22,231	22,563	+1
Management reconstruction fund (Loan parameters)	954	1,027	+8	Other			
Management stability fund (Loan parameters)	(30,000)	(30,000)	-24	Fishery compensation system			
International regulatory fund (Loan parameters)	1,844	1,409	-24	Fisheries disaster compensation	8,113	7,842	-3
International regulatory fund (Loan parameters)	(37,000)	(37,000)	-3	Vessel loss compensation	6,995	7,103	+2
MAFF Public Finance Corp. fund ² (Loan parameters)	910	883	-3	Subtotal	15,108	14,945	-1
Fisheries fuel oil fund	(13,000)	(13,000)	-70	Fishery environmental protection	1,665	1,728	+4
Subtotal	4,773	3,640	-24	Fish diseases research	285	357	+25
Small fisheries loan guarantees	5,450	4,660	-14	Fisheries enforcement	5,805	6,226	+7
Fishery cooperatives	702	889	+27	Regional improvement measures	1,615	1,421	-12
Fisheries modernization fund (Loan parameters)	3,831	3,403	-11	Measures for fishing vessels	213	158	-26
MAFF Public Finance Corp. fund ² (Loan parameters)	(125,000)	(125,000)	-11	Fisheries research	5,810	5,894	+1
Subtotal	(95,000)	(87,600)	(-8)	Other, nonspecified items	8,216	7,645	-7
Fishery products consumption, pricing, marketing and processing				Subtotal	38,717	38,374	-1
Consumption expansion	568	453	-20	Subtotal, nonpublic expenditures	105,181	103,355	-2
Price stabilization	1,381	1,794	+30	Total, general accounts	295,532	329,344	+11
Processing improvements				Special account			
Marketing depot construction	1,584	1,516	-4	Fishing vessel reinsurance and Fisheries mutual insurance	39,206	38,098	-3
Processing facilities fund	55	47	-15				

¹Fiscal year is from 1 April to 31 March; amounts are given in millions of yen.

²Funds for this item are not from the FAJ budget.

³JAMARC: Japan Marine Fishery Resources Research Center.

⁴The Fisheries Resources Survey (¥957 million for FY 1988) includes ¥61 million for southern bluefin tuna stock recruitment monitoring.

if the national government's financial situation is not so good, local governments may end up contributing a greater percentage of project funding.

The FAJ has placed greater emphasis on public spending in the FY 1988 budget. The public fisheries budget is about 69 percent of the entire FAJ gen-

eral account budget for FY 1988. The FAJ public fisheries budget increased by 19 percent from the FY 1987 budget, from ¥190 billion to ¥226 billion,

while the nonpublic budget decreased by about 2 percent, from ¥105 billion to ¥103 billion.

Public Expenditures

Several new 6-year plans began under Japan's public expenditures category in 1988. These include the "8th Long-Term Ports Maintenance Plan" (with a 6-year total budget of ¥2.4 trillion), the "3rd Coastal Fisheries Maintenance and Development Plan" (with a 6-year total budget of ¥480 billion), and the "New Coastal Fisheries Organization Improvement Plan, Second Period" (with a 6-year total budget of ¥100 billion).

Public Sector Fishing Port Projects

Over half (\$1.5 billion) of the entire fisheries budget will be spent on fishing ports. The "8th Long-Term Fishing Ports Maintenance Plan", like its predecessor, will stress the need for ports to adapt to the changing environment affecting Japan's fishing industry, emphasize the more efficient use of marine resources, establish an effective marketing and processing organization in response to the new information age, and ensure the vitality of fishing villages. Originally, a 6-year budget of ¥2.8 trillion was requested for the 8th Plan, but only ¥2.4 trillion was approved—still 14 percent greater than the ¥2.1 trillion allocated in the 7th plan. The FY 1988 budget provides approximately ¥185 billion for the first year of the 8th Plan. Of this amount, NIT Type B funds accounted for ¥28.2 billion.

Coastal Fishing Grounds Maintenance

The 6-year "2nd Coastal Fisheries Maintenance and Development Plan" ended in 1987 and will be succeeded by the 3rd Plan, also a 6-year program. Its goals are to organize the coastal fisheries infrastructure—specifically to maintain and promote coastal fisheries through the introduction of new technology. The 3rd Plan will receive ¥24.7 billion in 1988, ¥3.9 billion of which will come from NIT Type B funds. Notable programs under the 3rd Plan include: 1) A ¥115 million plan to intro-

duce new marine ranching technology, called the "Program for the Introduction of an Extensive-Use System in Coastal Waters"; 2) a ¥160 million program called the "Program for Efficient Use of Coastal Fisheries"; and 3) a ¥50 million study on the maintenance and development of existing coastal fisheries, as well as the development of new ones.

NIT Type A and B Projects

The FY 1988 FAJ budget earmarked ¥678 million in NIT Type A funds for expanding the use of fishing ports. One aspect of this program entails building dikes to prevent shoreline erosion, then building and selling houses on the stabilized shoreline. Some specific NIT Type B projects include the "Emergency Plan to Vitalize Fishing Village Fisheries", and the "Resort Area-Fishing Port Utilization Promotion Project." Both of these projects fall under the Fishing Ports, Coastal Fishing Grounds Maintenance, and Shoreline Preservation categories of the public account.

Nonpublic Expenditures

Domestic Fisheries Promotion

Promotion Master Plan

A new fisheries promotion master plan, called the "Project for General Development and Maintenance of Coastal and Inland Areas", was funded at ¥31 million for FY 1988. The plan, part of Japan's "Marinovation" Program, involves the development of 40 sites. "Marinovation 21" (Marine Innovation for the 21st Century) is one part of a concept developed by the FAJ in 1986 to more effectively utilize fishery resources within Japan's 200-mile zone. The ultimate goal of the program is self-sufficiency in the production of seafood. In 1986, the FAJ established a foundation, "Marino-Forum 21", to coordinate industry-government activities. "Marino-Forum 21" has been focusing on marine aquaculture and ranching, construction of artificial reefs and fish aggregating devices to boost fisheries production, and "marinovation," the introduction of

new technology to fishing villages to increase productivity.

Coastal Fisheries Improvement

This program was modified for FY 1988 in response to the changing conditions affecting Japanese fishermen. The new 6-year program, called the "Second-Phase Coastal Fisheries Improvement Program", has a total 6-year budget of ¥100 billion (\$800 million). This program consists of the "Basic Coastal Fisheries Structural Improvement Program" (involving 86 specific locations) and the "Prefectural Coastal Fisheries Structural Improvement Plan" (involving 39 locations) and will receive funds amounting to ¥6.7 billion in the FY 1988 budget. It is presumed that the fund allocation will escalate in the next 5 years.

Development of New Technology

Several new projects concerning the development of energy-saving devices will be funded in 1988. A new unmanned lighthouse will be developed with ¥16 million as a result of the 1987 Japan-ROK fishery negotiations. The 1988 budget also provides ¥16 million for the development of live fish shipment methods for Japanese trawlers. Finally, ¥51 million has been allocated to the new "Advanced Technology Development Plan". Additional information is not available.

Fish Farming and Salmon Release Programs

The "Plan to Develop Technology for the Increase of Regionally Cultured Species" is another new program funded under the 1988 budget. The project, which will receive ¥92 million in FY 1988, is designed to develop high-valued marine resources such as salmon to meet Japan's increasing demand for high-quality and diversified fishery products. A new study for the improvement of the quality of hatchery salmon, particularly coho salmon, will be funded at ¥13 million. The total funding for the fish farming and salmon release programs is ¥7.4 billion.

Aquaculture

Aquaculture projects received ¥347

million (2.8 million) in FY 1988, more than five times the funding they received in FY 1987. Several new programs bear mentioning: 1) The "Plan to Promote the Management of Fish Aquaculture," which is a program to build leadership and joint aquaculture management in fishery cooperatives; 2) the "Coastal Aquaculture System Technology Development Plan," a project also associated with Marino-Forum 21; and 3) a study to determine the effect of rot-resistant nets on shellfish.

Inland Fisheries Promotion

Of the total budget of ¥868 million, the "Basic Study on the Maintenance and Development of Inland Fisheries" has been granted ¥180 million. The Japan Marine Products Resource Development Center (JAMARC) is involved with this project.

Resource Management Promotion

The 1988 budget provides ¥472 million in resource management funds, three times the level of the previous year. Resource management projects include: 1) The "Program to Promote Aquaculture and Management Policy," a ¥360 million plan to improve fishery resource management by fishermen; 2) the "Experiment to Develop Technology for the Improvement of Long-Range Forecasts," a ¥12 million project to build a data base for a planned Fisheries Information Service Center; and 3) the "Coastal Fisheries Resource Management Improvement Fund," a program with "loan parameters" of ¥5 billion, to provide the financing for resource management implementation. The term "loan parameters," as used here, refers to a ceiling on a system of revolving loans for various budget items. The funds are usually reloaned after repayment. An expansion of the parameter means the addition of new money, while a reduction indicates a net return of funds to the system. In Table 1, the numbers in brackets following the heading "loan parameters" are not included in the budget total, but indicate the cumulative totals available for lending.

Several private-sector fisheries promotion projects (those designed to encourage private entrepreneurship) will

be funded by NIT Type C funds (see box). These include 1) the "Fisheries Related Research Development—Maintenance of the Business Structure," 2) "Project to Increase the Use of Fishery Ports," and 3) the "Maintenance of Open Areas in Ports." However, the implementation of these plans is on hold pending the revision of Japan's Privatization Law.

Fisheries Management

Production Restructuring and Emergency Loans

The "Fisheries Restructuring and Maintenance Fund," loan parameters of ¥60 billion; the "Fisheries Management Reconstruction Fund," loan parameters of ¥30 billion; the "Fisheries Management Stability Fund," loan parameters of ¥37 billion; the "International Regulatory Management Stabilization Fund," loan parameters of ¥13 billion; and the "Fisheries Modernization Fund," loan parameters of ¥125 billion), all remain unchanged from 1987. Loan parameters for the "Ministry of Agriculture, Forestry and Fisheries Public Finance Corporation Fund" decreased by about 8 percent from those of 1987.

Fishery Cooperatives

The "Interest Subsidy Program" for the "Fishery Cooperatives Trust Fund," received a 2-year extension. Interest subsidy funds will amount to ¥20 billion for FY 1988. The commercial interest rate is 3 percent, but the preferential interest rate for fishery cooperatives is 2 percent.

Fishery Products Promotion

The "General Plan for Marine Products Distribution and Processing", which expired at the end of FY 1987, will be continued in 1988 as the "Marine Products Central Distribution and Processing Structure Maintenance Plan", with a budget of ¥1.5 billion. In addition, a 5-year extension was granted to the "Fisheries Processing Facilities Fund" (which expired in March 1988). The loan parameters for this fund have been raised from ¥5.9 billion to ¥7.5 billion. Finally, last

year's "Fish Products Processing Management Improvement Program" was renamed the "Fish Products Processing Management Promotion Fund" and allocated loan parameters of ¥14 billion.

Resource Development and Access to Foreign Fisheries

The "Resource Development and Access to Foreign Fisheries" budget category of the 1988 "nonpublic" fisheries budget increased by almost 2 percent, from ¥22.2 billion in FY 1987 to ¥22.6 billion. A decrease in spending for marine resources development and access to foreign fishing grounds was offset by an increase in the budget for foreign fisheries cooperation and resource surveys.

Marine Resources Development

The FY 1988 budget for the Japan Marine Fishery Resource Research Center (JAMARC), a semi-governmental organization set up to develop and exploit underutilized marine fishery resources, decreased by 4 percent from the 1987 fisheries budget. The overall marine resources development budget declined by 4 percent in FY 1988.

Foreign Fisheries Cooperation

To promote international fisheries cooperation, the 1988 government budget provides a 4 percent increase. This will bring its funding to nearly ¥15 billion. A new program to promote the coastal fisheries of South Pacific nations will be funded at ¥142 million under this portion of the budget.

Resource Surveys

Of the total budget of ¥2.4 billion earmarked for resource surveys in FY 1988, the Japanese will spend ¥61 million to determine the trends in southern bluefin tuna resources being harvested by Australia, New Zealand, and Japan. Japanese scientists will also study the effect of driftnets on marine mammals, a problem central to the North Pacific area, and the effect of persistent marine debris on marine life. Scientific whaling, a new budget item in FY 1987, was increased by 45 percent from ¥355

million (\$2.5 million) to ¥515 million (\$4.1 million) in 1988.

Other Programs

Other programs awarded budget increases in FY 1988 are the "Fishery Environmental Protection Program," the "Fish Diseases Research Program," and

the "Fisheries Enforcement Program." Under the "Fishery Environment Protection Programs," the "Aquaculture Program" and the "Harmful Chemicals and Fishery Study" will be combined and funded at ¥81 million. Fisheries enforcement funding will be ¥6.2 billion, a 7 percent increase from 1987,

primarily because the Japanese will require an additional enforcement vessel to implement the 1988 Japan-Republic of Korea fisheries agreement. (Source: IFR-88/60, prepared by Paul E. Nie-meier and Richard Walsh of the NMFS Foreign Fisheries Analysis Branch (F/IA23) in Washington, D.C.)

MEXICO'S SEA TURTLE PROGRAM

The Mexican Government is concerned about sea turtle stocks off both its Pacific and Gulf coasts. Six of the world's seven species of sea turtles nest on Mexican beaches (Table 1). The Government has prohibited the capture of all sea turtles except for the Pacific ridley, which cooperative fishermen in the States of Oaxaca, Michoacan, and Guerrero are allowed to take in controlled numbers. Cooperative fishermen in those states have asked the Secretariat of Fisheries (SEPESCA) to increase the number of permits issued for the taking of turtles, but SEPESCA, as part of President Miguel de La Madrid's "100 Actions Program" to protect endangered species, has refused. Only 19 cooperatives in all of Mexico (9 in Oaxaca) were allowed to take turtles in 1987, the same number of cooperatives that had permits in 1986.

The Government has also intensified

its efforts to protect turtles. Penalties for illegal turtle fishing have been increased; fines may be levied of up to 1 million pesos (US\$1 = 1,400 pesos in summer 1987). SEPESCA, the Secretariat of Urban Development and Ecology (SEDUE), and the Navy, as well as several university groups, are cooperating in efforts to protect and study

marine turtles. Mexican newspapers have dealt with the results of these efforts and have reported on the status of turtles in several different Mexican states.

Gulf Coast Turtles

Tamaulipas

Mexico's Rancho Nuevo preserve located in the State of Tamaulipas is the only concentrated natural nesting ground left for the Kemp's ridley turtle, although sporadic nesting occurs from Veracruz to Padre Island in Texas. As many as 95 percent of nesting Kemp's ridleys do so at Rancho Nuevo. SEPESCA reported that 715 Kemp's ridley sea turtle nests

Table 1.—Glossary of Mexican sea turtles.

English name	Spanish name	Scientific name
Ridley, Atlantic	Lora	<i>Lepidochelys olivacea</i>
Hawksbill, Pacific	Golfina Carey/amarilla	<i>L. kempii</i> <i>Eretmochelys imbricata</i>
Green	Blanca/prieta/ verde	<i>Chelonia mydas</i>
Leatherback	Laud	<i>Dermochelys coriacea</i>
Loggerhead	Mestiza/cabullera	<i>Caretta caretta</i>

Table 2.—Mexican sea turtle catch, 1980-86.

State	Catch in metric tons						
	1980	1981	1982	1983	1984	1985 ¹	1986 ¹
Gulf of Mexico							
Campeche			163	1,585 ²	1,055		
Tabasco	28	42	53	39	61		
Quintana Roo	19			1	8		
Veracruz					1		
Tamaulipas				3			
Yucatan							
Subtotal ³	47	42	216	1,628	1,125		
Pacific Ocean							
Oaxaca	1,623	2,129	2,063	1,051	897		
Michoacan	452	133	130	113	76		
Chiapas				22	22		
Nayarit	93	41	11	13	9		
Sinaloa		103	21	12	7		
Baja Calif.					6		
Guerrero	112	169	167	20	1		
Baja Calif. Sur			208	56	1		
Jalisco			20	2			
Colima				1			
Subtotal ³	2,280	2,575	2,620	1,290	1,019		
Total ³	2,447	2,610	2,863	2,918	2,144	1,682	986

¹Only grand total data available.

²The large catch increase reported by SEPESCA is unexplained, but may be due to changes in statistical record keeping.

³The regional subtotal and total statistics do not match those divided by state. The discrepancy is unexplained.

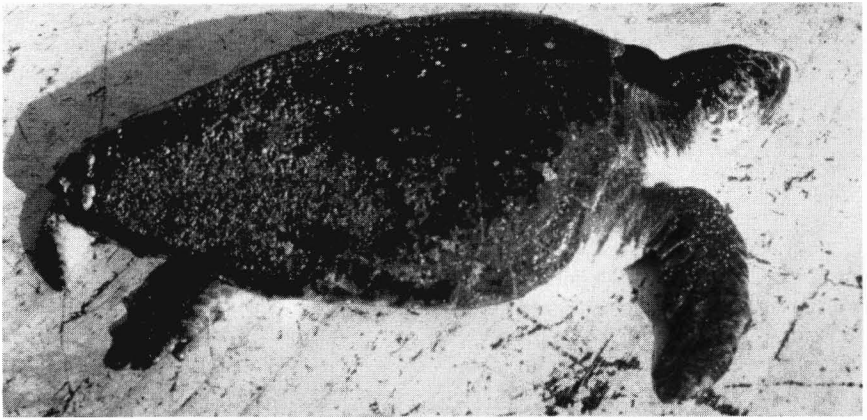
were spotted at the Rancho Nuevo preserve by the end of July 1987. The number is about the same as has been reported in recent years at Rancho Nuevo.

Ernesto Coripio Cadena, former Director of the Instituto Nacional de Pesca's (INP) research center at Veracruz (currently the SEPESCA Tamaulipas Agent), warned that the major natural nesting ground of the Kemp's ridley has been reduced to only a 20 km stretch along the Tamaulipas coast. Coripio charged that legal fishing (incidental turtle catches by shrimp trawlers) and natural predators are the principal causes of the Kemp's ridley decline. He also stated that the INP has arranged for armed military (Navy) patrols to protect nesting females along the 20 km beach area. Since 1978, according to INP biologists Rene Marquez and Manuel Sanchez, about 500,000 turtle hatchlings have been released along the Tamaulipas coast. The scientists claim that when they relocate the eggs from the beach to nests within protected corrals, they increase the number of eggs that hatch by about 70 percent. No reliable method, however, has been established to study the turtle's survivability once the hatchlings have been released.

In April 1987 Coripio outlined SEPESCA's 1987 protection plans. SEPESCA planned to release 50,000 hatchlings and mark as many as 200 adult turtles as part of a joint turtle study with the United States. The 1987 plan was similar to previous annual work plans. The study also included incubation, migration (some individuals have been radio-tagged), and nesting. Mexico provides the United States with about 2,000 Kemp's ridley eggs annually to develop a nesting population on Padre Island in Texas. The exchange is called the "Head Start program". Hatchlings are raised in captivity for about 1 year and then released. Mexico and the United States are also cooperating in a program designed to evaluate turtle excluder devices (TED's) on shrimp trawlers.

Campeche

Campeche has the largest population of nesting hawksbills along the Gulf of



Loggerhead sea turtle. Photo by Larry Ogren.

Mexico. Juan Jose Perex Palma, SEDUE Campeche agent, believes that recent regulations curtailing sand removal from the coastal beaches will be beneficial for the reproduction of hawksbill turtles which nest on the state's beaches. Previously, large-scale sand removal (for unspecified reasons) had destroyed thousands of turtle eggs. The Mexican Government, through both SEDUE and SEPESCA, plans to invest about 30 million pesos for a turtle protection camp at Sabancuy near Champoton. The camp will be guarded and consists of incubators, growout centers, and corrals. Scientists will collect eggs from nests and incubate them to prevent destruction by predators and poachers. SEPESCA and SEDUE plan to protect 150 nests and 25,000 eggs annually.

Yucatan

Yucatan is also protecting endangered sea turtles. Juan Jose Perez Palma, SEDUE agent, announced plans to create a turtle reserve at Isla Aguada off the Yucatan coast. Although no details are available, projects are underway to protect both the hawksbills and green turtles. Even so, stuffed turtles and turtle jewelry are prominently displayed in shops throughout Yucatan (as well as in Quintana Roo and Campeche).

Caribbean Coast: Quintana Roo

Illegal turtle harvesting is reportedly a common practice in Quintana Roo. In Isla Mujeres, Cancun, and Cozumel (popular tourist resorts where wild tur-

tles used to be attractions) the beaches rarely report wild turtles and tourists can now only observe them in pens.

Pacific Coast

Chiapas

Humberto Hernandez Ruiz, Tonala (Chiapas) cooperative fishermen's representative, has charged that turtle eggs are being taken illegally and transported to restaurants in the nearby city of Tuxtla Gutierrez. Hernandez asked that the state government assist SEPESCA in protecting and stopping the illegal flow of eggs with stricter enforcement and heavier fines.

Oaxaca

Oaxaca has the largest population of nesting turtles along the Pacific coast of Mexico. In July 1987, 30,000 Pacific ridleys reportedly arrived to nest on the La Escobilla beach. Oaxaca is one of the three states in Mexico which allows a limited number of turtles to be taken. The 1987 quota for the nine cooperatives allowed to take turtles was 23,000-24,000 turtles. The State planned to spend 25 million pesos on its turtle conservation program in 1987. Oaxaca has turtle observation and protection camps at Escobilla, Palmerito, and Chacagua. Officials report that at La Escobilla beach alone 7 million hatchlings have been released and 2,000 turtles had been marked since the beginning of 1987.

Oaxaca also has a slaughterhouse program in which eggs are taken from the

slaughtered female and incubated. In 1987, about 350,000 hatchlings were released from that program. SEPESCA, the state government, fishery cooperatives, various conservation groups, and universities are involved in both programs. The nine Oaxaca-based fishing cooperatives charged in a 1987 proclamation that foreign interests, "ignorant of Mexican socio-economic reality" were trying to influence Mexico's policy on sea turtle protection which the cooperatives believe is adequate. The fishermen claim that SEPESCA's management program has protected the turtle population, and believe that the stocks have increased rather than decreased. The fishermen claim that the Pacific ridleys are an important source of food and employment for the cooperatives.

Michoacan

The Universidad Michoacana (UM) reports releasing 280,000 hatchlings along the Michoacan coast during the 1986-87 turtle reproductive cycle. Other agencies are reportedly active in the protection program, including SEPESCA and SEDUE. There seems to be some disagreement, however, between agencies over their respective roles. (Officially, SEPESCA grants fishing permits and SEDUE is responsible for endangered species protection.) Ramiro Sanchez Perez of the UM Biology Department, objects to the SEDUE program and charges that SEDUE should not be officially involved in turtle protection. Sanchez stated that SEPESCA and the UM are collaborating on a protection plan by marking 500 turtles for study and increasing nest surveillance. The Navy conducts armed patrols to protect the nests. The protection program is

centered around the green turtle and the leatherback, but includes Pacific ridleys. Michoacan has turtle camps at Colola, Marauata, San Telmo, Chimapa, El Salado, Chiquiapan, Calabezas, Santa Ana, and Mexiquillo.

Colima

Francesco Perez Sarabia, SEDUE Regional Officer, stated that SEDUE planned to set up two turtle protection teams on the Chupadero and Playa de Oro beaches in Colima. The teams were to observe the loggerhead turtle nests for study and guard them from illegal poachers during the nesting season which ends in December. The teams were also to collect eggs, incubate them, allow them to grow, and then release them. Each team consists of technicians, patrols, and students from nearby universities. SEPESCA provides technical assistance. The Mexican Army planned to set up checkpoints on the borders with Jalisco and Michoacan to contain the contraband trade. The Navy was also to provide offshore patrols near the nesting grounds. Fishery cooperatives provided food and basic necessities to the teams.

Jalisco

SEPESCA hopes to release 50,000 turtle hatchlings in 1987 through a project coordinated by the Universidad de Guadalajara (UG), SEDUE, and the Navy. SEPESCA had originally planned to release 100,000 hatchlings but could not collect sufficient eggs. SEPESCA also planned to protect at least 1,000 turtle nests along the Jalisco coast. There are seven protection camps at Mismaloya, Tecuan, Teopa, and Tomatlan along the Jalisco coast. Maurilio Soto

Esparza, SEPESCA Regional Agent, stated that the turtle protection program can only work if the socioeconomic condition of the local fishermen is taken into account. Because of unemployment, underemployment, and low incomes, fishermen take advantage of whatever resource is available, including turtle poaching. About 70 people were arrested for turtle poaching in 1986, and 17 of them were fined a total of 300,000 pesos.

Nayarit

Although SEPESCA does not permit the taking of marine turtles in Nayarit, poachers reportedly take them all along the Nayarit coastline, and then ship them to Tepic, Guadalajara, and Mexico City for quick profit. The Director of the Centros Tecnologicos del Mar, Ignacio Carillo Diaz, has charged that the regulations protecting the turtles were not being enforced. He stated that turtles were often sold openly along the beaches, and that the practice is so widespread and accepted that the price for turtle meat is below that for beef. Information corroborating these charges is not available.

Sinaloa

One small turtle protection center in Elota was established for a week during a conference held in Mazatlan on marine turtle conservation. Another small camp operated by SEPESCA at El Verde has been functioning for many years. Observers stated that these small centers are the beginnings of a much larger protection program in the state. The Mazatlan Aquarium opened an exhibit to heighten local awareness of the endangered status of sea turtles.