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**The Economic Impact of Recent Changes
in the U.S. Tuna Industry**

Dennis M. King and Harry A. Bateman

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Working Paper No. P-T-47

A California Sea Grant College Program Working Paper

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in the U.S. Tuna Industry

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August 1985

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This work is a result of research sponsored in part by NOAA, National Sea Grant College Program, Department of Commerce, under grant number NA80AA-D-00120, project number R/NP-1-14G, through the California Sea Grant College Program, and by the Pacific Marine Fisheries Commission. The U.S. Government is authorized to reproduce and distribute for governmental purposes.

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THE ECONOMIC IMPACT OF RECENT
CHANGES IN THE U.S. TUNA INDUSTRY

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PREFACE

During the past five years, most U.S. tuna processors closed their west coast operations and in 1985, only one small tuna cannery is still operating in the U.S. The major U.S. tuna companies, Star-Kist, Van Camp and Bumble Bee, which account for over 70% of the U.S. canned tuna supply, now rely on production from offshore processing facilities in American Samoa and Puerto Rico and canned tuna imports from Asia to meet their market requirements.

The nearly complete relocation of U.S. tuna canning operations to offshore sites seems to have less economic significance than the dramatic increase in canned tuna imports over the past few years, but both have the same kinds of impacts on the U.S. economy. When an industry that produces \$1.5 billion in food products relocates to offshore U.S. territories or foreign sites, and then attracts support industries to those overseas areas, the loss of jobs, incomes, and economic activity in U.S. maritime industries is significant and generates "ripples" of indirect impacts that affect many segments of the U.S. economy.

This report describes some of the difficult circumstances facing the U.S. tuna industry and summarizes the impacts that have resulted from changes in the industry during 1980-1984. Since the report focuses on impacts related to the domestic U.S. economy, the offshore operations of U.S. firms in American Samoa and Puerto Rico are not considered here to be "U.S.-based." Although some distinctions are made in the report between lightmeat tuna (caught primarily by distant water purse-seiners) and whitemeat tuna (caught primarily by locally based trollers) we have, for most purposes, aggregated figures for both types of tunas.

The report is organized into five chapters including a summary of results (Chapter I), an introduction to global tuna fisheries (Chapter II), a description of the U.S. tuna industry (Chapter III), an outline of recent events which are changing the industry (Chapter IV), and a description of direct and indirect economic impacts associated with those changes (Chapter V).

CHAPTER I

SUMMARY AND CONCLUSIONS

Tuna resources offer unique opportunities for the U.S. and for other nations because they are international resources that grow to market size in the wild, can be harvested on the high-seas, and can be delivered to market without any of the public investments normally associated with shore-based food production. As a form of American enterprise tuna fishing is unique because most U.S. tuna fishermen engage in long distance search and capture operations in direct competition with fleets from over 20 other nations and then compete with them again to sell the harvest in a highly competitive international market.

The dominant market for tuna is the U.S., but many foreign tuna fleets can offer low cost fish to the U.S. market because they are nationalized or heavily subsidized and this makes it difficult for U.S. fishermen to compete even at home. The recent growth of foreign tuna fleets designed to serve the U.S. market and the relocation of U.S. tuna canneries to offshore sites has created special problems for U.S. tuna fishermen, especially those whose operations were designed to support a U.S.-based tuna processing industry. The decline in U.S.-based tuna operations has also generated economic losses in many other segments of the U.S. economy.

The relocation of U.S. processing operations to overseas sites has taken place over many years, but the most recent phase during 1980-1984 has been the most dramatic. Although the 157% increase in U.S. canned tuna imports during this period has attracted most public attention, the economic impacts associated with the relocation of the U.S. tuna operations are more significant. Although the capacity of the U.S. tuna fleet declined by only 14% during this five-year period, most U.S.-caught tuna is being delivered to offshore ports and U.S. landings by domestic vessels declined by nearly 60%. In 1985 only one small cannery is still operating in the U.S. and the four major U.S. firms that supply 70% of the U.S. market are relying completely on tuna processed at offshore locations and canned tuna imports from Asia for their supplies.

When a U.S. industry with annual retail sales of \$1.5 billion relocates to offshore territories and begins relying on foreign production, the economic impacts on the U.S. economy run deeper than the direct jobs and incomes lost in tuna-related industries. U.S.-based tuna operations are linked through their purchases and sales with many other segments of the U.S. economy. In general, each 100 tons of tuna landed and processed in the U.S. provides \$15,000 in direct income to fishermen, an additional \$12,000 in payments to cannery workers, and nearly \$75,000 in income payments to workers in those U.S. industries that support domestic tuna harvesting and processing operations.

The 200,000 tons of tuna landed in the U.S. during 1980 had an exvessel value of nearly \$200 million, but by the time it was processed and packaged for market was worth \$400 million, had stimulated \$1 billion in economic activity and had generated 12,000 jobs and \$300 million in household income in the U.S. As U.S. tuna operations move away from the U.S., these economic benefits are lost and during 1980-1984, this relocation resulted in economic impacts that are summarized in Exhibit 1.

EXHIBIT 1

SUMMARY OF ANNUAL ECONOMIC IMPACTS
RESULTING FROM THE THE RELOCATION OF
THE U.S. TUNA INDUSTRY

	FROM CHANGES IN U.S. TUNA HARVESTING INDUSTRY DURING 1980 - 1984	FROM CHANGES IN U.S. TUNA PROCESSING INDUSTRY DURING 1980 - 1984	FROM CHANGES IN ALLIED AND RELATED INDUSTRY DURING 1980 - 1984	TOTAL ECONOMIC IMPACTS
a/				
IMPACT ON U.S. HOUSEHOLDS				
Number of Jobs	-834	-3950	-7777	-12561
Household Incomes	(\$84,331,000)	(\$81,647,000)	(\$127,981,000)	(\$293,959,000)
a/				
IMPACT ON U.S. INDUSTRY				
Lost Sales	(\$139,000,000)	(\$395,000,000)	(\$784,747,000)	(\$1,318,747,000)
IMPACTS ON TAX REVENUES				
U.S. Government	b/ (\$16,886,000)	(\$16,329,000)	(\$25,596,000)	(\$58,791,000)
IMPACTS ON TAX REVENUES				
State of California	c/ (\$3,687,000)	(\$1,833,000)	(\$2,048,000)	(\$7,568,000)
d/				
IMPACTS ON U.S. FOREIGN				
TRADE DEFICIT				
Change in Imports	\$10,280,000	\$70,014,000	\$0	\$80,274,000
Change in Exports	\$21,600,000	\$0	\$0	\$21,600,000
Net Change in Balance of Foreign Trade	(\$11,340,000)	(\$70,014,000)	\$0	(\$58,674,000)

a/ The derivation of these estimates is described in Chapter V. They are based on changes in economic activity by U.S.-based tuna harvesters and processors during 1980-1984 and economic multipliers presented in the 1982 California Interindustry Fisheries (CIF) Model, California Sea Grant Technical Report P-T-31.

b/ The decline in annual U.S. tax receipts is based on an average federal tax rate of 20% for all workers and the direct, indirect and induced changes in household income taken from Chapter V.

c/ The decline in California state tax revenues is based on an average state income tax rate of 2% and the direct, indirect and induced changes in household income taken from Chapter V; 80% of the loss in household incomes in allied industries are assumed to be within California. Also included under "tuna harvesting" is \$2 million in state landings taxes associated with declines in California tuna landings.

d/ The estimate of net change in the U.S. Balance of Trade includes increases in the value of U.S. canned tuna imports and imports by U.S. vessels delivering to foreign ports adjusted by increases in the value of U.S. raw/frozen tuna exports during 1980-1984. Changes in foreign trade by allied and tuna-related industries during 1980-1984 were not linked here with direct changes in the U.S. tuna industry.

CHAPTER II

INTRODUCTION TO COMMERCIAL TUNA OPERATIONS

Commercial Tuna Fishing

U.S. tuna fishermen engage in a unique form of commercial enterprise. They are involved in the most primitive type of production, search and capture, yet they use the most modern technologies, including satellite fish finding and information systems. Their work takes them around the world on fishing trips that last up to three to four months aboard vessels that may cost as much as \$10 million. They compete on the high-seas with tuna fleets from over 20 other nations and they target on a unique natural resource that migrates through great expanses of ocean passing across national boundaries and even between oceans. After competing with foreign fleets on global tuna fishing grounds, U.S. fishermen must compete again with those same fleets to sell their catch in a highly competitive international market.

(1)

Global Tuna Resources

For the U.S. as for other nations, high-seas tuna resources offer special opportunities because tuna grow to market size in the open sea with no need for direct private or public investments. In this regard, U.S. tuna production can be contrasted sharply with U.S. agricultural production which requires large fixed private investments to initiate and maintain crop growth and involves huge public subsidies ranging from the maintenance of farm belt infrastructure to tax supported commodity price-maintenance programs.

Because tuna use the open ocean for grazing and tuna fishermen use the open ocean to harvest and transport their catch, the total cost of tuna production is reflected in harvesting costs. In the U.S. these costs are borne entirely by fishermen and there are few hidden costs to U.S. consumers or taxpayers. During 1984 tuna landings by U.S. fishermen were valued at around \$270 million. During the same year a comparable amount of

- (1) There are as many as 2,000 to 3,000 smaller U.S. tuna vessels that fish in local waters (usually within 1,000 miles of homeport) and sell their catch to a few local cannery agents. While these vessels do not compete directly on a global basis, their economic performance is influenced a great deal by foreign-based tuna fishermen who harvest the same tuna during different parts of the migration and offer frozen tuna for sale to agents of the same few canneries.

agricultural products from U.S. farmers involved federal subsidies that cost the American taxpayer at least \$17 million.
(2)

Special Economic Problems

A number of factors contribute to the economic hardships being faced by U.S. tuna fishermen during the early 1980's. They include the "El Nino" environmental phenomena which caused unfavorable changes in the migratory patterns of Pacific tunas, increased competition from foreign tuna harvesters and processors, and inadequate business planning by U.S. tuna fishermen. (3) It cannot be overemphasized, however, that in recent years U.S. tuna fishermen have had to compete on the international fishing grounds with nationalized and heavily subsidized foreign fishing fleets and then again in the U.S. food market with subsidized U.S. agricultural producers and foreign suppliers. (4)

-
- (2) In the April, 1985 issue of the University of Massachusetts ALUMNUS (April, 1985), Eugene N. Engel, Director of Policy Analysis at the University of Massachusetts, Agricultural and Resource Economics Department, reports on "The Crisis on the Farm: Who Pays and Why." He summarizes that "In 1983 gross income from U.S. agriculture totalled \$138 billion (and) government price support programs cost approximately \$9.2 billion." Based on these figures, each \$270 million in agricultural output which generates about \$252 million in gross income to farmers involves a government (taxpayer) subsidy of \$17 million.
- (3) "El Nino" is the name given to an occasional environmental phenomenon which involves dramatic changes in ocean temperatures and correspondingly dramatic changes in weather and fishing conditions. Significant "El Nino" conditions developed during 1982-1984 and resulted in unusually poor fishing conditions in the traditional U.S. tuna fishing areas of the eastern tropical Pacific and unusually good fishing conditions in distant tuna areas in the central/western Pacific.
- (4) Many of the world's high-seas tuna fleets are owned and managed by government or quasi-government organizations which coordinate fleet movements and fish deliveries. Because these high-seas tuna fleets constitute major national investment for many nations and are, in many cases, viewed as part of the naval auxilliary, their operations during difficult economic times are usually subsidized.

Widespread Economic Impacts

In the U.S. economy the impacts of losing the U.S. tuna industry run deeper than the direct jobs and incomes lost in domestic fishing and fish processing industries. When an industry that produces \$1.5 billion in food products moves out of the U.S. and attracts support industries to offshore sites, the indirect and induced economic losses spread into many sectors of the U.S. economy. (5) Considering the direct losses within the tuna industry and indirect losses in allied industries, the relocation of U.S. tuna processors between 1980 and 1984 has had economic impacts which are summarized in Exhibit 1. Overall, changes in the domestic tuna industry during 1980-1984 had economic impacts that can be compared to the elimination of the entire New England fishing industry from the U.S. economy. (6)

-
- (5) During 1984, U.S. consumers purchased the equivalent of 39.36 million standard cases of tuna (a standard case contains 48 6-1/2 to 7 ounce cans) which had an approximate wholesale value of \$1.03 billion and an approximate retail value of \$1.49 billion. Significant volumes of petfood, fish meal and fish oil made from tuna by-products resulted in additional market sales and export revenues.
- (6) During 1980, tuna canneries in the continental U.S. and Hawaii produced tuna with a wholesale value of approximately \$590 million; during the same year the wholesale value of processed seafood products from New England was approximately \$685 million. The 7236 jobs reported lost in the U.S. tuna industry during 1980-1984 are comparable to the 7069 jobs reported in the New England seafood processing industry during 1983.

CHAPTER III

DESCRIPTION OF U.S. TUNA INDUSTRY

Changing Industrial Structure

The structure of the U.S. tuna industry has changed dramatically during the past ten years. Through the mid-1970's, the harvesting and processing segments of the U.S. tuna industry were well integrated. Corporate entities in each segment of the industry were linked together through financial obligations, equity-sharing and long-term supply contracts and U.S. tuna vessels had a secure market for their catches. Foreign-caught tuna was more expensive than domestic-caught tuna and was imported primarily to offset domestic supply shortages.

During the late 1970's, the size of the international tuna fleet grew at an alarming rate and relationships between U.S. tuna harvesters and processors began to change. Besides increasing in size, many foreign fleets turned to high volume "U.S. style" tuna purse-seine fishing and as a result, the supply of foreign-caught tuna available to U.S. and foreign tuna processors increased significantly. Competition among new foreign tuna harvesters drove international tuna prices to levels far below that which domestic U.S. fishermen and their financial supporters had learned to expect.

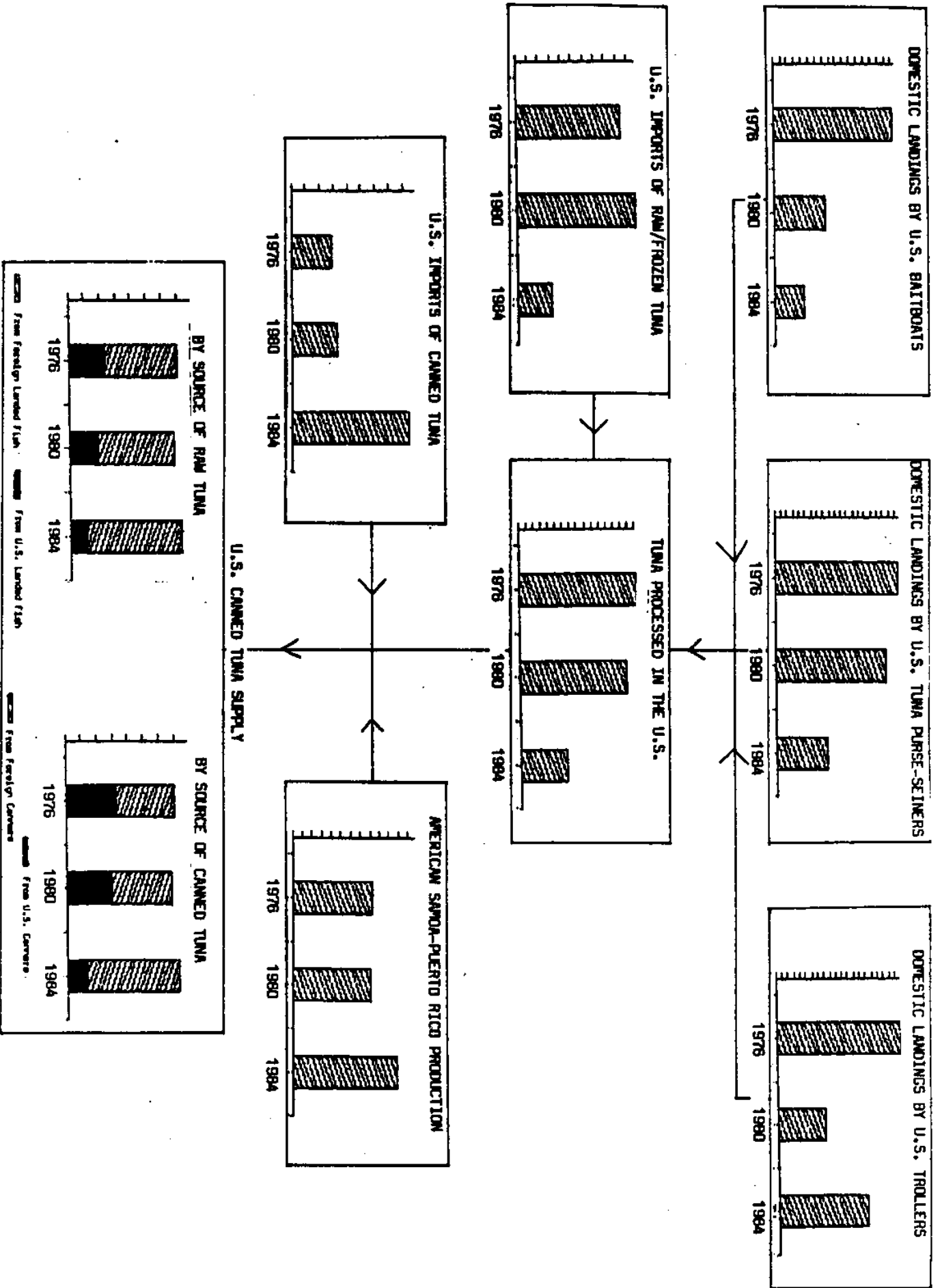
Facing their own competitive pressures from foreign tuna canners, the major U.S. tuna processing companies reacted quickly to changing market conditions by revising their basic raw tuna procurement strategies. Until the 1980's, U.S. tuna processors secured reliable low cost tuna supplies by contracting dependable domestic fishermen, but with reliable supplies of low cost tuna available from many diverse sources outside the U.S., this was no longer necessary. Within a few years they reduced their involvement with U.S. tuna harvesters and increased their purchases of low cost tuna in the international market. The close working relationship between U.S. tuna harvesters and processors disintegrated during 1980 - 1985 and there are no signs that conditions will improve in coming years.

During the early 1980's when U.S. tuna processors were relieving themselves of financial and contractual obligations with the U.S. tuna fleet, interest rates and fuel prices in the U.S. were increasing dramatically. This put enormous upward pressure on domestic fishing costs at a time when foreign competition and the strong U.S. dollar were driving tuna prices down in international markets. Most U.S. tuna fishermen had no experience marketing tuna and until this time had been relying on U.S. processors for financial and managerial support as well as a secure market. During 1980-1983 when most U.S. tuna vessel operators began to function independently of U.S. processors and

began competing for the U.S. market against well-organized, government-managed, low cost foreign tuna producers, raw/frozen tuna prices declined by 20% - 35%. Because of the growing strength of the U.S. dollar, the effective tuna price received by foreign fishermen from U.S. canners during this period actually increased in some cases. U.S. exvessel tuna prices have fallen an additional 20% - 25% during 1983-1985 and are currently at levels where most domestic vessels cannot cover operating costs. Moreover, U.S. vessels are now fishing under an "open ticket" which means that they leave port with no assured market for their catch and must negotiate with buyers when they return to port and are holding loads of perishable fish. (7)

-
- (7) During early 1985, low domestic exvessel tuna prices and the high cost of delivering or transshipping tuna to overseas canneries made it impossible for most U.S.-flagged tuna vessels to cover operating costs. In July, 1985, as many as 60 large tuna vessels operating under the U.S. flag organized under the U.S. Tuna Sales Association and agreed to "tie up" with vessels refusing to offload fish or resume fishing until exvessel tuna prices increase.

CHANGING U.S. SUPPLY OF TUNA PRODUCTS



Tuna Fishing Methods

U.S. tuna fishermen engage in three types of fishing:

PURSE-SEINING produces 30% of the global tuna harvest, but accounts for over 90% of U.S. tuna landings. Purse-seining involves encircling tuna with a net and relies on the tendency of most tuna species to form schools near the surface. In recent years this method has been used successfully with Fish Aggregation Devices (FADs) which enhance the surface schooling behavior of tuna. Large "superseiners" which can freeze and store up to 1500 tons of fish and travel up to 10,000 miles during a single fishing trip are the most common type of vessel in the U.S. tuna purse-seine fleet. In 1985 the U.S. tuna purse-seine fleet consists of 122 vessels, but fewer than 100 are active.

POLE AND LINE FISHING from baitboats produces 40% of the global tuna harvest, but accounts for only 4% of U.S. tuna landings. With this method fish are attracted to the vessel with bait and taken by fishermen using poles and lines. To a large extent, this method has been replaced by purse-seining in the U.S. fleet. There are still 25 U.S. baitboats operating primarily out of west coast ports, but only 14 are active.

TROLLING accounts for less than 1% of the global tuna harvest and only 5% of U.S. tuna landings. U.S. trollers, however, produce virtually all of the U.S. take of albacore tuna which is the preferred species among U.S. consumers and is the only tuna that can be labelled "whitemeat" in U.S. markets. (8) With this method, lines are towed through known areas of tuna abundance by relatively small vessels that venture as far as 3,000 miles from port on trips that last as long as 45 days. There are roughly 200 large trollers in the U.S. fleet that fish almost exclusively for albacore and another 2,000 to 3,000 smaller vessels that troll for albacore in season, but fish for salmon, crab and other species as well.

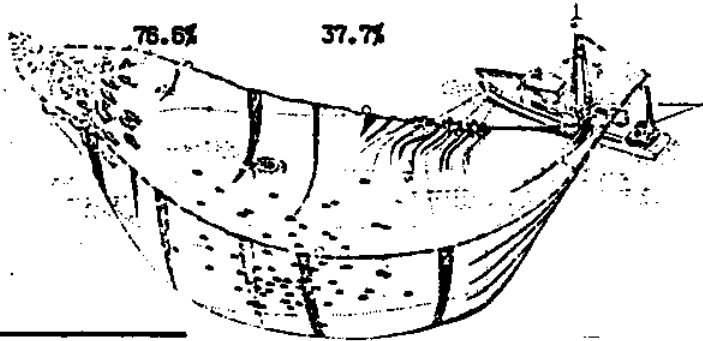
-
- (8) In the U.S market canned albacore or "whitemeat" is sold at a price that is usually 50% above the price of comparable "lightmeat" products. Most U.S. consumers seem to prefer the firm, white flesh of albacore, but because of its relatively high price, whitemeat tuna usually accounts for less than 30% of U.S. canned tuna sales.

**EXHIBIT 3
METHODS OF TUNA FISHING
USED BY U.S. FISHERMEN***

PURSE-SEINERS

- large, high volume, distant-water vessels
- encircle fish with net
- target on skipjack and yellowfin tuna

	1976	1980	1984
Total Domestic Catch	\$180,000,000	\$276,600,000	\$251,700,000
U.S. Landings at Domestic Ports	\$119,900,000	\$212,000,000	\$ 95,000,000
Domestic Landings as a % of Total U.S. Catch	66.6%	76.6%	37.7%



BAITBOATS

- medium size vessels that operate near coasts
- attract tuna with bait and take with pole and line
- target primarily on skipjack and yellowfin

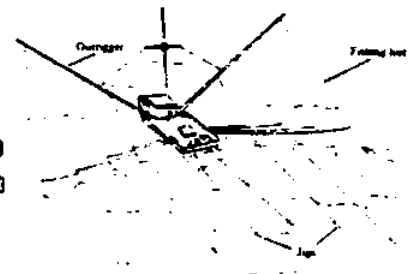
	1976	1980	1984
Total Domestic Catch	\$10,000,000	\$8,400,000	\$4,700,000
U.S. Landings at Domestic Ports	\$10,000,000	\$8,400,000	\$4,700,000
Domestic Landings as a % of Total U.S. Catch	100%	100%	100%



TROLLERS

- small vessels operating in east/central Pacific
- target on albacore
- smaller vessels fish salmon, albacore

	1976	1980	1984
Total Domestic Catch	\$19,800,000	\$12,700,000	\$18,700,000
U.S. Landings at Domestic Ports	\$19,800,000	\$12,800,000	\$18,900,000
Domestic Landings as a % of Total U.S. Catch	100%	99.3%	98.9%



*These three methods account for over 98% of commercial tuna landings by U.S. vessels; gillnets and long-lines account for the rest.

Tuna Fishing Areas

Tuna resources exist in tropical and temperate waters of the Atlantic, Pacific and Indian Oceans and tend to be most abundant in a band 20° on either side of the equator. Tuna are highly migratory and travel up to 10,000 miles per year at speeds of up to 40 miles per day. There are a few locally-based tuna fisheries, but most tuna fishing is conducted by distant water fleets which follow tuna across the high-seas as they migrate. During 1984, less than 6% of U.S. tuna landings were taken from U.S. waters and this was primarily albacore taken by locally-based trollers. (9)

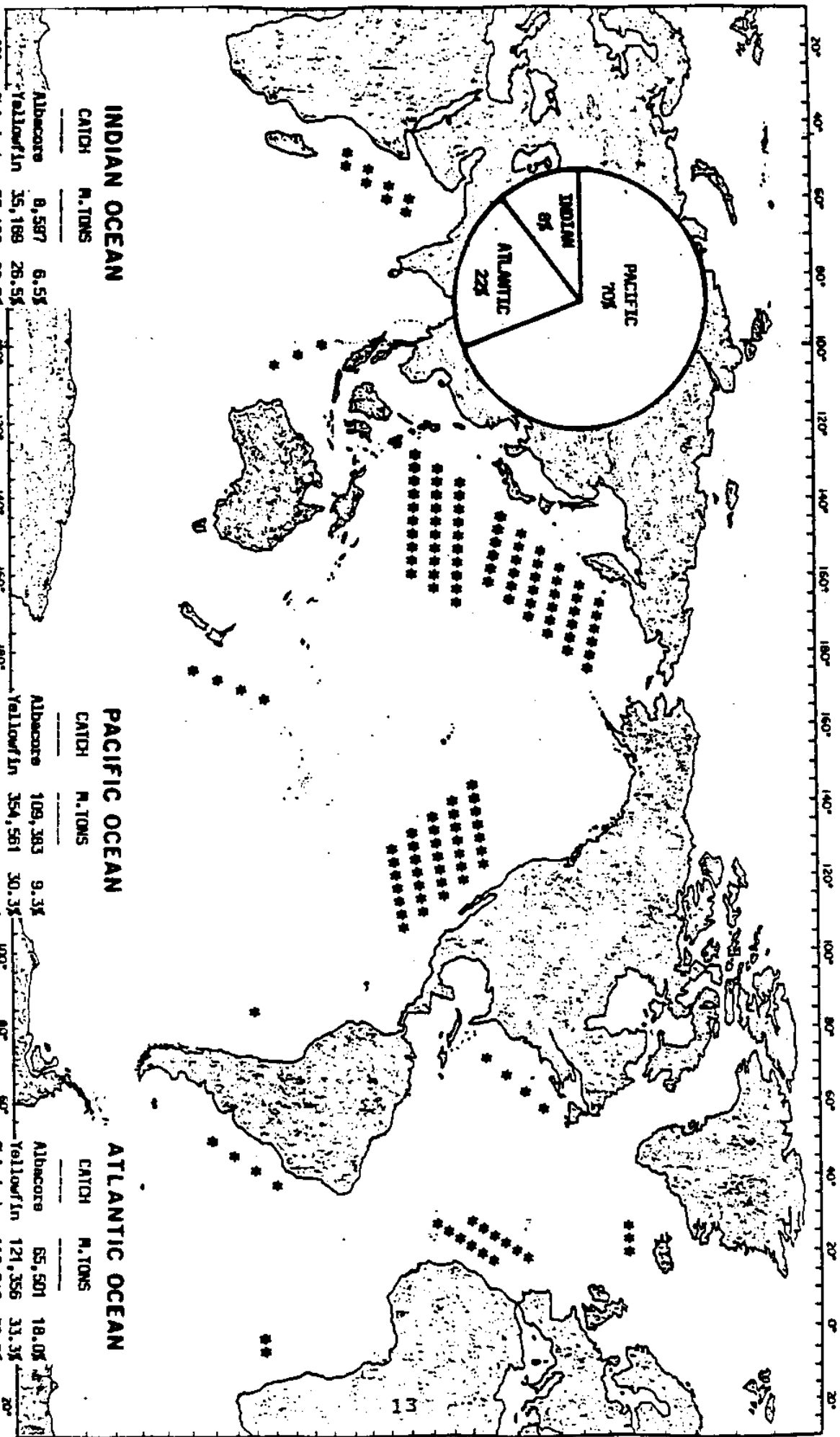
As new areas of tuna abundance or availability are discovered or new migratory passages are identified, international tuna fleets shift from one area of the globe to another. For this reason the relative efficiency and competitive advantage of one gear-type or one national fleet over another is never constant. For this same reason economic forecasts of vessel or fleet performance or regional market conditions tend to contain more error than similar forecasts related to other industries and markets.

Traditional U.S. tuna fishing areas are located in the eastern tropical Pacific, but in recent years, U.S. purse-seiners and trollers have been venturing to the central and western Pacific. A combination of favorable environmental factors and new fishing techniques have greatly improved fishing success in that area, but it is unclear whether favorable conditions will persist in the central/western Pacific. It is most likely that future U.S. and foreign tuna operations will range throughout the Pacific with vessels moving to eastern areas or western areas as fishing conditions dictate.

As more is learned about the migratory nature of tunas, it becomes easier to understand the fiercely competitive nature of international tuna fishing. Albacore taken in the traditional winter fishery off Japan, for instance, now appear to be the same group of fish taken during the following spring near Hawaii and during the following summer and fall off the U.S. west coast. Vessels in different national fleets, in other words, compete for the same tuna resources even though they may be fishing thousands of miles apart. This may mean that increasing U.S. imports of tuna from foreign fleets operating in the western Pacific result in compound losses for U.S.-based tuna fishermen because they not only reduce markets for U.S. fishermen, but may also reduce the amount of fish available on the U.S. side of the Pacific.

(9) Coastal U.S. waters refer to the ocean area 0 - 200 miles from the U.S. shoreline. During 1984, 10,720 s.tons of albacore and 6,630 s.tons of other tunas were taken from this area. The U.S. tuna harvest from all ocean areas during 1984 was approximately 290,000 s. tons.

LOCATION OF GLOBAL TUNA HARVEST



INDIAN OCEAN

CATCH	M. TONS
Albacore	8,587
Yellowfin	35,189
Skipjack	35,482
Other	53,578
Total	132,827

PACIFIC OCEAN

CATCH	M. TONS
Albacore	109,383
Yellowfin	354,561
Skipjack	572,156
Other	135,200
Total	1,171,300

ATLANTIC OCEAN

CATCH	M. TONS
Albacore	65,501
Yellowfin	121,356
Skipjack	118,542
Other	58,823
Total	364,222

Sources: FAO Yearbook of Fishery Statistics, 1982.

* = 10,000 m. tons of tuna

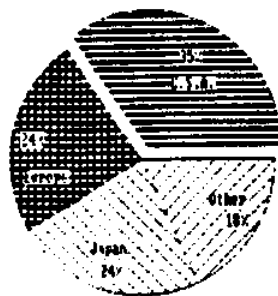
U.S. Tuna Markets

Global Perspective

U.S. consumers purchase 35% of the global tuna harvest, but usually account for nearly 60% of the global canned tuna market. Most international tuna trade is directed toward canned tuna markets so the world tuna trade is dominated by the large U.S. canned market. Other canned tuna markets in Europe and Japan are protected by high import tariffs and other trade barriers which are far more restrictive than those imposed by the U.S. The relative vulnerability of the U.S. market to import penetration has resulted in unusual supply pressures in the U.S. market which have caused raw/frozen and canned tuna prices to decline and contributed to economic turmoil in the U.S. tuna industry.

EXHIBIT 5

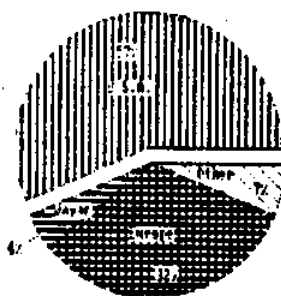
U.S. SHARE OF GLOBAL TUNA MARKET 1983



ALL TUNA PRODUCTS

NATION	ANNUAL CONSUMPTION*	MARKET SHARE
U.S.A.	800,000	35%
Japan	400,000	24%
Europe	400,000	24%
Other	300,000	18%

*Metric tonnes; raw weight equivalent



CANNED TUNA ONLY

NATION	ANNUAL CONSUMPTION (standard cases)	RAW WT. EQUIVALENT (in tonnes)	MARKET SHARE
U.S.A.	28,200,000	637,088	57.3%
Japan	2,062,500	45,000	4.0%
France	4,500,000	88,181	8.8%
Italy	4,750,000	103,838	9.3%
Spain	3,500,000	78,383	8.9%
England	928,000	20,182	1.8%
Germany	1,300,000	28,383	2.5%
Belgium	450,000	9,818	0.9%
Netherlands	500,000	10,809	1.0%
Switzerland	150,000	3,273	0.3%
Denmark	175,000	3,814	0.3%
Other	3,487,750	76,887	8.8%
TOTALS	51,000,250	1,112,726	100.0%

SOURCE: E.R.G. PACIFIC, INC.

U.S. Tuna Demand

Canned tuna is the only seafood staple in the diet of most Americans. During 1984 it accounted for 53% of retail seafood purchases in the U.S. and around 70% of U.S. households are thought to include canned tuna as part of their regular supermarket purchases. (10) The popularity of canned tuna in the U.S. reflects the fact that canned tuna is not oily and "not fishy" which appeals to U.S. tastes, gets good grades for nutrition, and is convenient to store and serve. Also important is the fact that the yield of edible meat from a purchase of canned tuna is 100% compared with only 36% for most cuts of beef sold in the U.S. and 41% for chicken. (11)

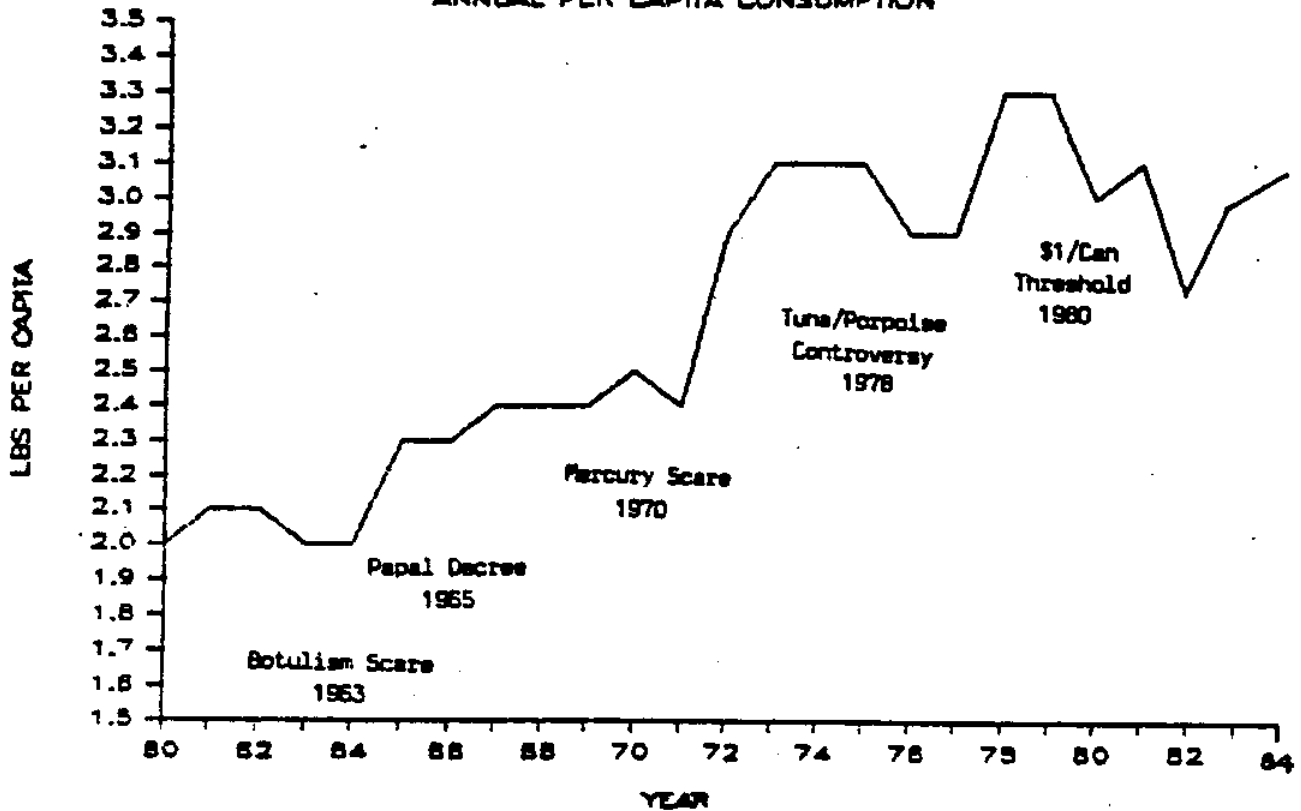
Over the past 25 years, there has been a relatively steady upward trend in U.S. tuna consumption. Several temporary declines in U.S. consumer demand for tuna were associated with specific events, such as publicity about seafood contamination or porpoise kills, but demand has always recovered within a few years. (See Exhibit 6.) If the 25-year trend continues, per capita tuna consumption in the U.S. will grow about 2% per year which, after adjusting for population growth, is consistent with the 3% to 4% annual market growth forecast by tuna industry pundits. (12)

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- (10) Most recent SAMI reports (August, 1985) show 52-week retail canned tuna sales of \$1.357 billion out of a 52-week total for all seafood of \$2.566 billion. An NMFS sponsored National Seafood Consumption Survey conducted during 1981 showed that "household penetration" of canned seafood, primarily tuna, was 63% - 73% compared with a maximum of 26% for breaded fish, 20% for frozen fish, and 16% for fresh fish.
- (11) Yields of edible meat refer here to the net weight after trimming, boning and cooking. The figures cited are from a joint United Nations/Asian Development Bank report published as part of the 1984 INFOFISH market studies series. The report, entitled THE TUNA MARKET (VOLUME 2) refers to these yields specifically for cuts of meat sold in the U.S. market.
- (12) The 2% growth rate in per capita consumption expected on the basis of the 25-year trend is based on a simple linear extrapolation. A more detailed method of forecasting tuna demand on the basis of price and income changes is presented in King, D.M., "Forecasting U.S. Consumer Demand for Tuna," Proceedings of the 33rd Annual Lake Arrowhead Tuna Conference, 1982.

U.S. demand for canned tuna is sensitive to changes in income and price levels and also to publicity about the contamination of any type of seafood product. The market is keenly responsive to problems associated with the quality of canned tuna products and for this reason the foreign processing of canned tuna for the U.S. market is usually supervised carefully by representatives of the large U.S. tuna suppliers who frequently sell the foreign product under their own labels. The familiar American tuna suppliers like Star-Kist and Van Camp are, in fact, becoming distributors of foreign packed tuna. In 1985 tuna packed outside the U.S., including the pack from American Samoa and Puerto Rico, will account for up to 98% of the canned tuna sold in the U.S. even though the share of the market held by the familiar nationally-advertised brands is still over 70%.

EXHIBIT 6

U.S. TUNA DEMAND
ANNUAL PER CAPITA CONSUMPTION



SUMMARY OF U.S. MARKET TRENDS

Exhibit 6 shows the 25-year trend in U.S. per capita tuna consumption. In general, each .10 pound change in ANNUAL PER CAPITA CONSUMPTION means a change in wholesale/retail tuna sales of around 1 million standard cases and a change in raw tuna requirements of around 20,000 short tons.

Some of the events which caused abrupt declines in per capita tuna consumption in the U.S. are noted on the graph. In general, demand for tuna increased rather steadily from 2.0 pounds per capita in 1960 to a peak of 3.3 pounds per capita during 1979. "Chunk light" tuna is the most popular canned product in the U.S. accounting for 80% of the market, and during 1980 the price of this product passed an apparent psychological threshold of \$1 per can. Since the U.S. economy was turning down and the price of tuna substitutes such as beef and poultry were declining sharply during 1980, it can be seen that the impact of the \$1 per can price on U.S. tuna demand was dramatic. By 1982 the market had dropped 12% to 2.9 pounds per capita representing an annual loss in wholesale/retail tuna sales of 4 million standard cases and a decline of 90,000 short tons in the raw/frozen tuna requirements of U.S. canners.

Tuna processors tried to stimulate a recovery during 1981-1982 by reducing wholesale prices, but retailers chose to hold retail prices and profit margins high and accept lower sales volumes. The market improved during 1983-1984 in response to drastic price cuts by domestic producers and market penetration by low cost canned tuna imports. Retail/wholesale price cuts made during 1983-1984 were then passed back to fishermen in the form of lower raw/frozen tuna prices which, along with the relocation of U.S. canneries, has had a drastic effect on the financial performance of the U.S. tuna fleet.

CHAPTER IV
CONDITION OF U.S. TUNA INDUSTRY

U.S. Tuna Harvesters

During the first quarter of 1985, 26% of the U.S. purse-seine fleet, 10% of the U.S. baitboat fleet, and 25% of the U.S. albacore troller fleet were idle because they could not operate profitably or else could find no market for their catch. (13) Many of the vessels that were operating found that they lost money because of the deterioration of the domestic exvessel tuna market and the high cost of transshipping tuna to foreign processing sites. Most of the smaller vessels in the U.S. fleet were designed specifically to serve a west coast tuna processing industry and are unsuited for any other domestic fisheries. Unlike U.S. farm land which constitutes a national asset with some permanent intrinsic value and which can be converted to other uses or held as an asset, the idle U.S. tuna fleet represents assets which cannot be productive without a domestic tuna processing industry and they are assets that can move quite easily to foreign nations. The decline in the size of the U.S. tuna fleet, in other words, represents the loss of U.S. assets to foreigners rather than a market induced shift of U.S. capital from tuna fishing to some other domestic industry.

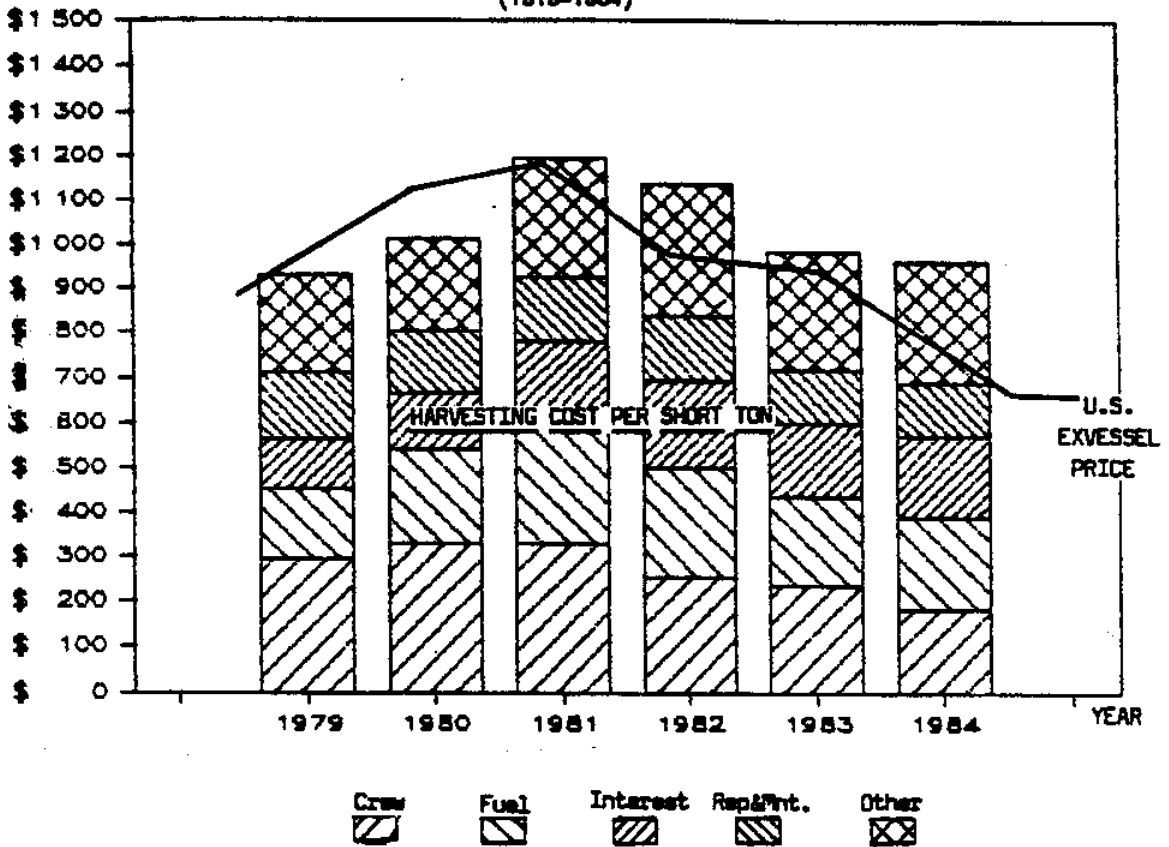
The decline in the number of active U.S. tuna vessels actually reflects a small part of the economic decline in the industry. To remain competitive, U.S. flagged vessels that continue to fish must refuel and reprovision and perform repair and maintenance where they offload fish. When they deliver to foreign ports, these U.S. flagged vessels take with them the market for shoreside support services resulting in significant losses to other maritime industries. A domestic tuna fleet is a source of "primary economic activity" in the sense that it brings new resources into the national economy and thereby generates secondary benefits. When a domestic tuna fleet delivers to a foreign port, however, almost no secondary benefits are generated in the U.S. and that vessel, in terms of generating economic benefits, is only slightly better than a foreign flagged vessel. During 1980 - 1984, the capacity of the U.S. tuna fleet declined by 14%, but U.S. port visits by U.S. tuna vessels and tuna landings at U.S. ports, which are far more important to the U.S. than the size of the U.S. flagged fleet, declined by 51% and 47%, respectively.

(13) These percentages reflect the number of vessels in the U.S. tuna fleet that were idle during early 1985 and actually understate the problem. The size of the U.S. tuna fleet (seiners, baitboats and trollers) had declined by over 100 vessels during 1980 - 1984 because of deteriorating economic conditions.

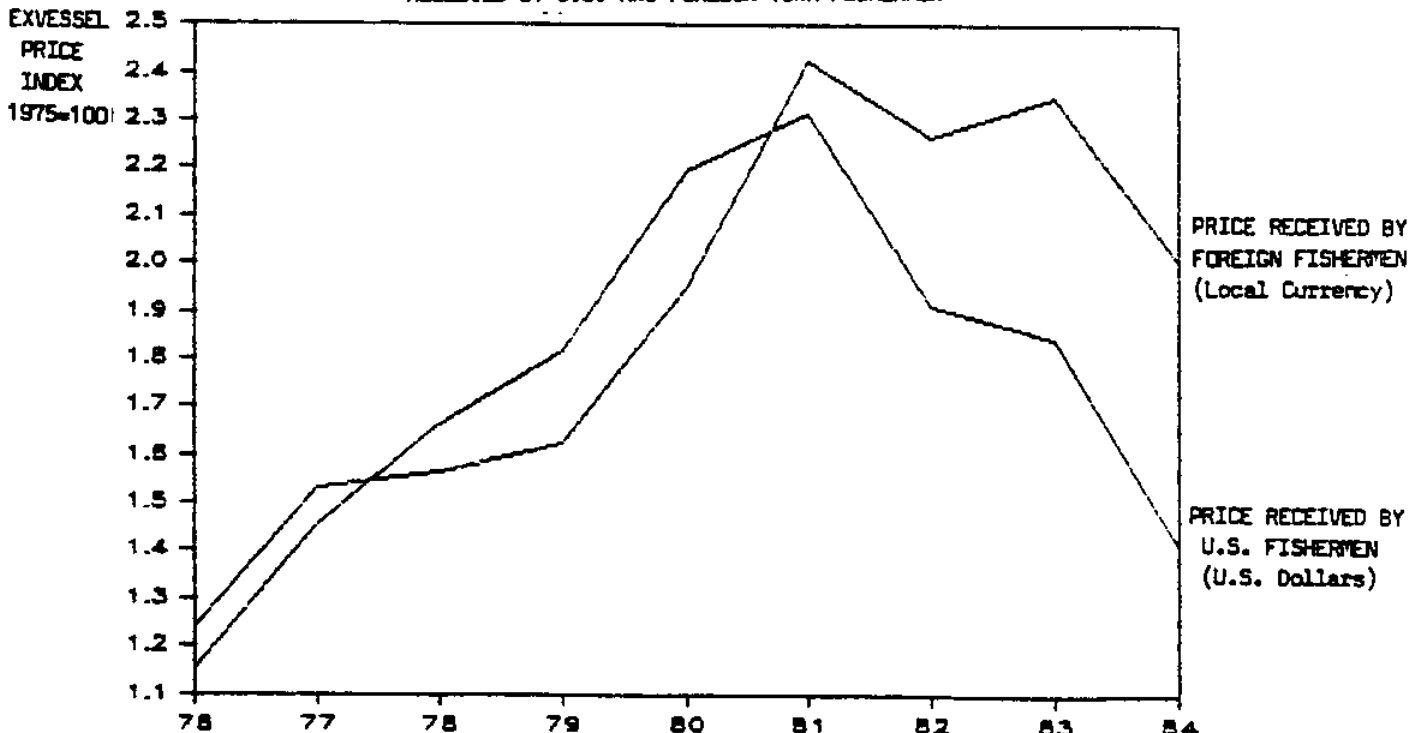
It is important to note that the difficult conditions facing U.S. tuna harvesters will not improve the long-term economic health of the industry by weeding out inefficient operators. The vessels most desired by foreign buyers and most likely to be sold to them at distress prices by U.S. tuna fishermen are the newer, more efficient vessels which were constructed when interest rates and construction costs were high. Current conditions, in other words, may purge the U.S. fleet of relatively modern vessels leaving the U.S. with a fleet of older vessels that have few financial shackles and a limited international market.

EXHIBIT 7

U.S. EXVESSEL TUNA PRICE AND HARVESTING COST PER TON
FOR U.S. TUNA PURSE-SEINERS
(1979-1984)



COMPARISON OF EFFECTIVE PRICE
RECEIVED BY U.S. AND FOREIGN TUNA FISHERMEN*



*The comparison is based on identical prices paid by U.S. processors for domestic and foreign-caught tuna. Effective price differences are based on foreign exchange rate differences which have allowed foreign tuna fishermen to better absorb declining U.S. tuna prices than U.S. tuna fishermen.

U.S. Tuna Processors

Despite the fact that there are 50-75 different labels on the canned tuna that reaches U.S. supermarket shelves, 73% of the U.S. market is supplied by four U.S. companies and the rest is supplied by fewer than 12 foreign firms. With the exception of U.S. operations in American Samoa and Puerto Rico, most non-U.S. producers operate independently of the three major U.S. companies, but since these U.S. firms market significant amounts of foreign processed products, they frequently supervise fish procurement and processing operations at foreign owned canneries.

Until the major U.S. tuna companies moved their operations offshore, raw fish accounted for about 50% of tuna canning costs at U.S. facilities, and the labor used to clean, cook and package fish at U.S. canneries accounted for only 12% to 15% of overall canned tuna costs. (14) Since raw fish costs are similar at different cannery locations around the world, and labor costs constitute a relatively small portion of overall canning costs, it seems that differences in labor or fish costs alone did not account for the relocation of the U.S. processors to foreign sites. (15)

Contracting labor at 40 cents per hour in Thailand and \$3.00 per hour in Samoa results in savings of only 10% and 15% on the basis of overall tuna canning costs even if the productivity of labor is assumed to be the same in those areas as it is in the U.S. (16) Most of this savings is offset by the cost of

(14) Raw fish costs for chunk light tuna are roughly \$17 per standard case (based on 45 cases per ton and an average exvessel fish price of \$750 per s.ton). Labor costs during 1984 at U.S. canneries were approximately \$3 to \$5 per standard case (based on labor at \$7 per hour and standard yields, cleaning rates, etc.).

(15) According to INFOFISH and other sources of international seafood prices, the range of skipjack and yellowfin prices at different cannery locations around the world is quite narrow. During June-July, 1985, for instance, the exvessel price of standard size yellowfin tuna (7.5 pounds to 20 pounds per fish) at various locations was as follows: Puerto Rico \$820-\$850, American Samoa \$800, Mexico \$862, Japan \$865.

(16) If the wage rate at U.S. canneries is \$7 per hour and labor costs are \$3 - \$4 per standard case, a comparable amount of labor (.4 - .6 hours) at Samoa would cost \$1.20 - \$1.80, and at Thailand \$.16 - \$.24. At full production cost of \$20 per standard case, the substitution of foreign labor accounts for savings of 10% to 15%.

delivering the canned tuna product from those foreign sites to the U.S. market, so it seems that other economic forces influenced the decision by U.S. tuna processors to relocate. (17)

The most significant advantages that seem to have attracted U.S. tuna processors to foreign countries involve guarantees of long-term tax concessions, limited responsibilities for worker health and welfare and relatively weak environmental restrictions related to cannery emissions. (18) Ironically, many of the foreign sites that have attracted U.S. tuna processors are able to offer these economic advantages because of the flow of U.S. tax dollars that is provided to them as aid. The Philippine tuna industry, for instance, which in 1983 accounted for 26% of U.S. canned tuna imports, was developed through U.S. A.I.D. programs which are financed by U.S. tax dollars. In the U.S. territories of American Samoa and Puerto Rico, U.S. tax dollars have developed industrial sites for U.S. tuna processors and supported social and environmental programs that allow the governments of these islands to offer concessions that cannot be matched in the U.S. (19) The processing of tuna at all major offshore locations is subsidized in part by U.S. taxpayers with an even larger cost paid by coastal U.S. tuna fishermen who through their tax payments have helped subsidize the relocation of their only market.

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- (17) Cost of shipping canned tuna from foreign cannery sites to the U.S. market is approximately \$1.00 to \$1.60 per standard case. Based on production costs of \$18 to \$20 per case, shipping charges increase overall costs by 5% to 10%.
- (18) An additional factor that is pointed out frequently by industry leaders as a cause of the cannery relocations is the relatively high rents charged at Southern California ports for cannery sites. It appears, however, that the prevailing rents paid by tuna canneries at U.S. ports were below market. If rents had any impact on the relocation decision at all, therefore, it was probably the anticipation of rent increases whenever the profitability of U.S. tuna canning improved.
- (19) In addition to U.S. government supported port and site development projects and financial assistance for "training" local workers, U.S. firms that relocate to American Samoa and Puerto Rico are provided special tax advantages under U.S. Federal Government Program 936. This program provides an exemption from U.S. federal taxes on operations in U.S. territories.

EXHIBIT 8
SUPPLIERS TO U.S. TUNA MARKET

FIRM/HEADQUARTERS	DESCRIPTION	U.S. MARKET SHARE	BRAND NAMES	PROCESSING LOCATIONS
STAR-KIST FOODS, INC. Terminal Island, California	100% subsidiary of H. J. Heinz Co.; dominates U.S. market and is growing fast worldwide through the acquisition of foreign canners.	39%	Star-Kist, House Brands	Mayaguez, Puerto Rico Pago Pago, American Samoa
VAN CAMP SEAFOOD St. Louis, Missouri	100% subsidiary of Ralston Purina Co.; primarily a petfood and agricultural firm; tuna operations have been losing to Star-Kist and imports.	21%	Chicken of the Sea, Van Camp, House Brands	Pago Pago, American Samoa Ponce, Puerto Rico
BUMBLE BEE SEAFOODS San Diego, California	Until 1985, a 100% subsidiary of Castle & Cooke, San Francisco; tuna and other seafood operations taken over by San Diego management in heavily leveraged buyout during 1985.	11%	BumbleBee	Mayaguez, Puerto Rico Honolulu, Hawaii
CHB FOODS Terminal Island, California	Only U.S.-based cannery operating in 1985; privately owned and operated by Pan Pacific Fisheries; introduced AMERICAN brand tuna in 1985.	2%	American, Express Pan Pacific, CHB, Lucky Strike, Top Wave, Fed Mart, Lucky Lady, Scotch Buy, Sea Trader, Breast of Chicken other House Brands	Terminal Island, California
NEPTUNE PACKING CORP. White Plains, New York	Subsidiary of Mitsui of New York; linked with large Japanese trading company.	3%	Geisha, supermarket House Brands	Mayaguez, Puerto Rico
MITSUBISHI FOODS INC. Del Mar, California	U.S. subsidiary of large Japanese trading company.	3%	Three Diamond, Sun Harbor	Ponce, Puerto Rico
OTHER U.S. FIRMS	Lazio Fish Co., (packing frequently for Mitsubishi);	<.5%	See Mitsubishi	Eureka, California
	The Mormon Church (noncommercial)	<.1%	None	San Diego, California
IMPORTS	Primarily Thailand, Philippines, Korea	21%	Mainly institutional pack, off brands, house brands; recently, nationally advertised brands too	Pacific Rim

CHAPTER V

THE ECONOMIC IMPACT OF THE RELOCATION

The Source of Impacts (20)

The relocation of U.S. tuna processors outside the U.S. has obvious direct economic impacts associated with lost jobs and incomes for domestic cannery workers and lost domestic markets for U.S. tuna fishermen. U.S.-based tuna harvesters and processors, however, are linked through their purchases and sales with other segments of the U.S. economy and the loss of these industries generates indirect and induced economic impacts that ripple throughout the economy. Each case of canned tuna processed in the U.S., for instance, requires fish purchases of \$10 to \$12 and \$6 to \$9 in purchases of non-fish materials such as cans, cartons, labels, port services, etc. To produce the tuna required for a case of canned tuna, U.S. tuna fishermen purchase an additional \$8 to \$10 worth of goods and services from other U.S. industries. These support industries, in turn, hire labor and make purchases of their own to support their tuna related sales setting off additional rounds of economic activity. As the U.S. tuna industry moves to foreign sites, there is a corresponding decline in support industries which result because of "multiplier" effects.

In general, each 100 tons of tuna landed and processed in the U.S. provides \$15,000 in direct income to fishermen, an additional \$12,000 in income payments to cannery workers and \$75,000 in income payments to workers in U.S. industries that support domestic tuna operations. The 200,000 tons of tuna landed at U.S. ports during 1980 had an exvessel value of nearly \$200 million. By the time it was processed and packaged for market, however, this fish was worth around \$400 million and had stimulated \$1 billion in economic activity and generated 12,000 jobs and \$300 million in household income in the U.S. As U.S. tuna operations move away from the U.S., these economic benefits are lost and since the U.S. has had to import more canned tuna,

(20) Changes in the amount of tuna landed and processed in the U.S. (50 states) during 1980-1984 were estimated from NMFS Market News Service data and information published in Fisheries of the U.S. Income, Employment and Output Multipliers used in this section were taken from California Sea Grant Reports P-T-5 and P-T-6 which describe the 1980 California Inter-industry Fisheries (CIF) Model, and California Sea Grant Reports P-T-32 and P-T-41 which present revisions of the CIF Model for 1982-1983.

the relocation during 1980-1984 also increased the annual U.S. Balance of Trade Deficit by approximately \$70 million per year. (21)

Measuring the Impacts

To U.S. tuna fishermen the events of the past few years have been alarming, but the decline in the U.S. tuna industry has actually taken place over many years. For purposes of evaluating the economic impacts of losing the U.S. tuna industry, therefore, it is difficult to find an appropriate baseline for comparisons. During the 1950's, for instance, when the U.S. tuna market was supplied primarily by domestic-caught fish delivered to over 20 U.S.-based tuna processors, the market was less than half its current size and the U.S. tuna fleet consisted primarily of small, local baitboats. Offshore tuna processing started in Puerto Rico during the 1950's and in American Samoa in the early 1960's and as far back as 1970, U.S. canneries at these offshore sites were supplying one-third of domestic canned tuna supplies. In a sense, the relocation of the U.S. tuna industry has taken place continuously over the past 25 years even though the changes over the past few years have been the most dramatic.

For purposes of analysis, we will assess the economic impacts of the most recent phase of the tuna industry's relocation which took place during 1980-1984 and will compare the incomes, jobs, etc. associated with the U.S. tuna industry in 1984 with those that occurred during 1980. The U.S. tuna market was approximately the same size in both years (30 million cases or around \$1.5 billion retail), but 50% of the U.S. market was supplied by U.S.-based canneries during 1980 compared with only 15% during 1984 and only around 2% during 1985. The sources of direct economic impacts associated with the decline of U.S.-based tuna harvesting and processing during 1980-1984 are shown in Exhibit 9.

(21) During 1980-1984, U.S. imports of canned tuna increased by 159% from 3.2 million cases to 8.3 million cases per year. This represents an increase in U.S. imports of approximately \$70 million per year.

EXHIBIT 9

SOURCES OF DIRECT ECONOMIC IMPACTS

DECLINE IN	1980		1984		DIFFERENCE (1980-1984)		PERCENT CHANGE (1980-1984)	
	VOLUME (s.tons)	VALUE (\$ 000)	VOLUME (s.tons)	VALUE (\$ 000)	VOLUME (s.tons)	VALUE (\$ 000)	VOLUME	VALUE
<u>TUNA HARVESTING:</u>								
Domestic Tuna Landings (at U.S. ports only)	200,000	\$233,000	106,000	\$94,000	(94,000)	(\$139,000)	-47.0%	-59.7%

DECLINE IN	1980		1984		DIFFERENCE (1980-1984)		PERCENT CHANGE (1980-1984)	
	VOLUME (000 of 1st.cases)	VALUE (\$000)	VOLUME (000 of 1st.cases)	VALUE (\$000)	VOLUME (000 of 1st.cases)	VALUE (\$000)	VOLUME	VALUE
<u>TUNA PROCESSING:</u>								
Domestic Tuna Processing (includes processing of raw/frozen tuna imports)	14,750	\$590,000	6,500	\$195,000	(8,250)	(\$395,000)	-55.9%	-67.0%

Direct Economic Impacts (1980-1984)

Lost Jobs

The direct economic impacts are associated with the cannery closures themselves and the fact that 5,000 to 7,000 cannery workers were put out of work on the U.S. west coast. Most of those who lost their jobs were unskilled and semi-skilled workers from areas where they have poor prospects for alternative employment. Through individual initiative and locally sponsored retraining programs, 40% to 60% of the dislocated workers have found other jobs, but 40 to 60% are still unemployed, some for as long five years. (22) Ironically, some former cannery workers found jobs in local shipyards only to lose them later when tuna vessel maintenance contracts moved overseas to support U.S. and foreign vessels delivering fish offshore processing sites.

Lost Incomes

U.S.-based tuna processors make payments to workers in the form of wages and salaries that account for 12% - 15% of production costs. During 1980 the \$500 to \$600 million in tuna products processed at U.S.-based tuna canneries generated direct household incomes of \$70 to \$80 million. During 1984 the remaining U.S.-based tuna canners produced only \$180 to \$200 million in canned tuna and paid out \$25 to \$30 million in wages and salaries. This constitutes a decline of over 60% in direct payments to U.S. households by U.S. tuna processors during 1980-1984. (23)

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- (22) According to Steve Edney, National Director of the United Industrial Workers, about 40% to 50% of displaced tuna cannery workers in the Los Angeles area and 50% to 60% of those in the San Diego area are still out of work (August, 1985).
- (23) The Star-Kist tuna cannery at Terminal Island, California closed during late 1984 leaving only one small U.S.-based tuna cannery in operation during 1985. The decline in U.S.-based cannery output and the corresponding decline in U.S. cannery-based jobs and incomes during 1980-1985 is close to 95%.

Lost Taxes

The west coast cannery closures also had some direct impacts on local, state and federal tax revenues. The dislocated cannery workers, who contributed approximately \$16 million in federal taxes and \$2 million in state and local taxes, not only stopped contributing to government, but in most cases became a net drain on the tax system. (24) Reduced California landings tax receipts accounted for an additional \$2 million to \$3 million in lost state revenues. Unemployment and welfare payments to out of work cannery workers during 1984 may have been as high as \$50 million.

Indirect Economic Impacts

As U.S. tuna companies reduce the size of their U.S.-based operations, the negative impact on sales and employment in support industries and the economic decline in fishery-related communities on the west coast can be observed almost immediately. First there are what are referred to as INDIRECT IMPACTS associated with reduced jobs, incomes and sales in cannery-support industries including the domestic tuna fishing. Then there are what are referred to as INDUCED IMPACTS associated with reduced spending by local households with incomes tied to cannery operations such as cannery and dock workers and domestic fishermen. The size of these INDIRECT and INDUCED IMPACTS can be estimated using economic multipliers that have been developed for the U.S. tuna harvesting and processing industries. (25)

Using generally accepted economic multipliers for the tuna harvesting and processing segments of the U.S. economy, the INDIRECT and INDUCED IMPACTS of each \$1,000 worth of fish landed in the U.S. and each \$1,000 worth of fish processed in the U.S. are shown in Exhibit 10. Comparing conditions during 1984 with conditions during 1980, the direct, indirect and induced economic impacts of the relocation are shown in Exhibit 11.

(24) Estimated direct loss of federal and state tax revenues is based on a simple 20% federal and 2% state income tax rate applied to reduced wages and salaries earned by cannery workers.

(25) The multipliers used here are taken from the 1982 California Interindustry Fisheries (CIF) Model, Sea Grant Technical Report P-T-31. The employment, income and sales multipliers presented in that model for "tuna purse-seining" and "tuna canning" sectors apply specifically to California, but reflect most indirect and induced impacts.

EXHIBIT 10

DIRECT COEFFICIENTS AND ECONOMIC MULTIPLIERS
FOR U.S. TUNA HARVESTING/PROCESSING INDUSTRIES

HARVESTING SECTOR:	DIRECT COEFFICIENTS	TYPE I MULTIPLIERS (DIRECT & INDIRECT)	TYPE II MULTIPLIERS (DIRECT, INDIRECT & INDUCED)
Economic Activity	\$1,000	\$1,526.4	\$3,684.3
Household Incomes	\$606.7	\$752.4	\$1,048.3
Jobs	.008 jobs	.0121 jobs	.0282 jobs

PROCESSING SECTOR:	DIRECT COEFFICIENTS	TYPE I MULTIPLIERS (DIRECT & INDIRECT)	TYPE II MULTIPLIERS (DIRECT, INDIRECT & INDUCED)
Economic Activity	\$1,000	\$1,806.6	\$3,338.6
Household Incomes	\$206.7	\$534.2	\$744.2
Jobs	.010 jobs	.0204 jobs	.0318 jobs

EXHIBIT 11

DIRECT, INDIRECT AND INDUCED
ECONOMIC IMPACTS OF CHANGES IN STRUCTURE
OF THE U.S. TUNA INDUSTRY, 1980-1984

	Resulting From Decline in Domestic Tuna Landings	Resulting From Decline in U.S.-based Tuna Processing	Resulting From Declines in Domestic Harvesting & Processing
Loss of Revenues to U.S.-based Industries			
Direct	\$139,000,000	\$395,000,000	\$534,000,000
Direct and Indirect	\$212,170,000	\$501,437,000	\$713,607,000
Direct, Indirect and Induced	\$512,118,000	\$808,629,000	\$1,318,747,000
Loss of Income to U.S. Households			
Direct	\$84,331,000	\$28,731,000	\$113,062,000
Direct and Indirect	\$104,584,000	\$108,425,000	\$211,009,000
Direct, Indirect and Induced	\$145,714,000	\$148,245,000	\$293,959,000
Loss of Job Opportunities for U.S. Workers			
Direct	834 jobs	3,950 jobs	4,784 jobs
Direct and Indirect	1,682 jobs	6,376 jobs	8,058 jobs
Direct, Indirect and Induced	3,920 jobs	8,641 jobs	12,561 jobs