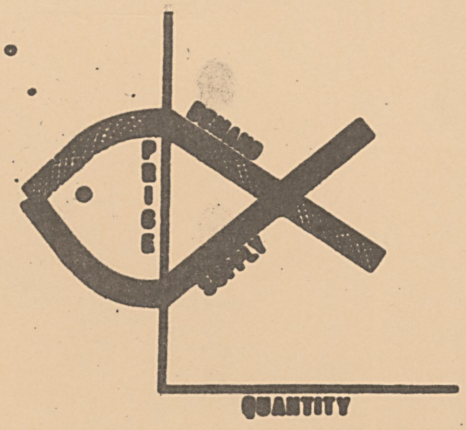

Potential for Increasing Productivity in the Seafood Industry

by

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FOREWORD

The National Commission on Productivity has been directed to conduct a study seeking ways to improve productivity in the food industry as a means to better food price stability in the future. The study will identify opportunities for immediate action to stimulate productivity as well as to indicate areas where long-range studies should be profitable.

The study is being carried out by a Task Force comprised of staff from Government agencies located in Washington, augmented by specialists from industries and universities. One of the nine sub-panels has dealt with the seafood sector of the food industry. Other sub-panels were concerned with meat, dairy, fruits and vegetables, processing and manufacturing, retailing, production, labor, and transportation.

The attached draft report of the Seafood Panel will be incorporated into the overall report to be submitted by the National Commission on Productivity to Secretary of the Treasury, George Shultz, Chairman of the Cost of Living Council.

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I. INTRODUCTION AND BACKGROUND

Continually growing demands for seafoods from a relatively fixed resource base have brought about a situation of supply shortages and rapidly increasing prices. Retail prices for edible seafood products consumed in the United States have increased 28 percent since 1968. This compares with an increase of 14 percent for all food prices, 20 percent for beef prices, and 6 percent for poultry prices during the same period. This short supply and growing demand picture varies in intensity by product, and as species vary in abundance from year to year; but it extends to most of the popular species of fish and shellfish and generally is a worldwide phenomenon. It is particularly characteristic of shrimp, tuna, lobsters, cod, haddock, halibut, and scallops. Unless supplies of these or close substitute products can be expanded significantly in the near future, these conditions will intensify and consumer seafood prices will rise at an even more rapid rate than they have in these past 5 years.

Total world catch of fish has more than tripled in the past 20 years, increasing at a rate more rapid than world population growth. Total landings increased from 21.1 million metric tons in 1950 to 69.3 million tons in 1970. Much of this increase is accounted for by the harvest of lesser known edible species and of species used for the production of fish meal, an important ingredient in broiler feed rations. It is becoming more and more the accepted opinion among world authorities, however, that this

rate of increase in total world catch of fish cannot continue. The fishing effort applied to many species is either at or beyond that required to harvest the maximum sustainable yield and thus there are increasing threats to the maintenance of current yields of many of the more important species.

The U.S. catch of fish and shellfish during 1950-70 has remained about constant averaging about 2.1 million metric tons per year. U.S. utilization (edible consumption and industrial use) on the other hand increased from 3.0 to 5.3 million metric tons from 1950 to 1970, with most of that increase being supplied by imports. In 1950, 25 percent of total U.S. supplies of fishery products came from imports. In 1970, imports made up 57 percent of the total supply. The degree of dependence on imports varies considerably by species. Consumption of species such as salmon, oysters, and crabs comes almost entirely from domestic production.

The United States currently consumes almost 15 percent of the total world supply of edible fish. We consume 32 percent of all shrimp caught, 66 percent of the lobsters, 79 percent of the scallops, 57 percent of the oysters, 60 percent of the clams, 37 percent of the tuna, 27 percent of the salmon, and almost all the crabs. In recent years we have begun to face stiff competition in terms of both the resources themselves as well as for the products in international trade.

The world catch of many of these popular fish and shellfish from known existing stocks is very near the estimated maximum yield. In fact because of

- the pressures of demand and rising prices
- the rapidly expanding fishing fleets throughout the world
- relatively ineffective national and international regulatory mechanisms for controlling fish catches and conserving resources

the world is facing a growing threat of overfishing which could drastically reduce fish stocks from present levels. In addition since most fish and shellfish species spend a part of their life cycles in the estuaries and near-shore waters, there is the ever-present threat of pollution and other man-made environmental changes further reducing fish stocks.

Although fishing pressures in U.S. fisheries have increased significantly in recent years, total catch has remained relatively constant because of a declining catch per unit of effort. Technological improvements associated with vessel navigation and fish locating and catching techniques have been more than offset by the effects of an increase in fishing effort on fixed or even reduced stocks. Thus productivity in the harvesting of fish and shellfish in the United States has actually declined in recent years (see attached table).

Productivity gains for fish processing in recent years have been about comparable to that in other food processing. The marketing and distribution system beyond the processor level for seafood products (except for fresh fish) uses a system common to all food products. This system by world standards is efficient. This is not to say there are no possibilities at this level for improvements in productivity in the distribution system, but most of these need to be approached more broadly than just for seafood. Therefore, with respect to improving productivity for seafood, overriding problems at the harvesting and processing levels must be addressed before we can expect to significantly alter the rising trend in consumer seafood prices. To be effective, steps must be taken to increase supplies and to ameliorate those factors deteriorating the existing state of fish stocks.

II. OPPORTUNITIES FOR IMPROVEMENTS IN PRODUCTIVITY IN THE SEAFOOD INDUSTRY

Some measures, at both harvesting and processing levels, can be taken which will increase supplies of seafood products. Other steps can be taken which will maintain the yield from stocks currently fished. Still other actions would significantly increase productivity of inputs in fishing (reduce the input of labor and capital per unit of output); however, they would not increase the total supply of fish and therefore likely would not result in a decline in consumer prices. Nevertheless, these latter measures are socially beneficial and should be undertaken.

A. Steps to Increase Supply

1. Developing Underutilized and Unutilized Species (2-4 years)

a. Problem

Significant quantities of certain fish and shellfish off U.S. coasts and elsewhere in the world provide potential for development of substitutes to existing products in short supply. The structure and capital position of most segments of the U.S. fishing industry preclude private industry from developing such products without assistance from Government in assessing the abundance and distribution of the fish stocks, developing the necessary harvesting and processing techniques, developing new product forms, and broadening the market and overcoming consumer acceptance problems. The following table lists examples of some species with estimated high potential for development and the problems inhibiting their use. Adequate assistance is not now available within existing Government programs.

Species	Preliminary Estimated Potential	Present Utilization	Problems Hindering Development
Red, Jonah, & Cancer Crabs	500 mil lbs	0	Harvesting & Processing Techniques; Market Acceptance
Mullets	Not available	35 mil commercial; 22 mil sport	New Product Forms; Market Acceptance
Groupers	Not available	8 mil commercial; 70 mil sport	New Product Forms; Market Acceptance
Jack Mackerel	1,500-3,000 mil	50 mil	Harvesting & Processing Techniques
Spanish & King Mackerel	Not available	King 6 mil; Spanish 10 mil; Sport catch several times commercial catch	Expansion of Market Area
Rock Shrimp	25 mil	Nil	Processing Techniques; New Product Forms
Saury	Not available	None	Assessment of Distribution & Abundance; Harvesting Techniques
Squid	Not available	30 mil	Assessment of Distribution & Abundance; Marketing Acceptance
Sablefish	Not available	5 mil commercial; 50 mil foreign	Assessment of Distribution & Abundance; Market Acceptance
Pacific Rockfishes	Not available	25 mil	Processing Techniques; Expansion of Market Area
Qhahog Clams	100 mil	nil	New Product Forms; Mkt Acceptance
Calico Scallops	25 mil	2 mil	Processing Techniques

The above list pertains to fisheries relatively near U.S. shores. On a worldwide basis, tuna and shrimp are of extreme importance to the U.S. market. Substantial stocks of tunas are believed to inhabit the Central Pacific; however, there is insufficient data on their location, distribution, and abundance. Also, new harvesting techniques and gear would have to be developed for these tunas. Tropical shrimp fisheries exist in about 60 countries around the world. In several areas - West Africa, India, Indonesia, other Southeast Asian countries - stocks are not believed to be fully exploited.

b. Solution

(1) Expand existing minimal programs for locating resources, defining potential, developing new harvesting techniques, and new product development by Federal Government. ($15 million NOAA, DOC.)

(2) Matching fund grant program or tax credit for private industry for demonstration and application of improved harvesting and processing techniques, and for production of new product forms and market testing. ($10 million, NOAA, DOC.)

c. Appraisal

(1) Solution 1 - Would not require new legislation and could be effected immediately. Should undertake only those activities beyond the capability of industry. Must be done in close coordination with industry. Industry and Government should

work toward more fully utilizing and further developing stocks of fish and shellfish presently preferred by the U.S. consumer. Development of species not presently used requires a longer development and education process.

(2) Solution 2 - Would possibly require new legislative authority; would stimulate industry to take over on its own at the earliest opportunity. With tax credits, incentive is supplied if the firm's own funds are involved. Many firms would be interested in investment in ventures of greater than normal risk if tax dollars were utilized. Could have problem of proprietary vs public information. Industry efforts are now confined to substitution of a very limited number of closely related species.

d. Discussion

Positive: The annual domestic catch off U.S. coasts is approximately 2 million tons with at least 3 million tons being taken by foreign fishing fleets. A gross estimate of the annual potential yield of U.S. coastal waters without regard to technological, economic or acceptance considerations is 10 to 15 million tons. Although a substantial portion of this is clearly not within reach of existing technology and would not provide readily acceptable substitute products, a portion of which could be brought under commercial production by one or more of the following applied research activities:

- Exploratory work is required to locate commercial concentrations of various resources and define their season availability.

- Gear research is required to determine the most efficient methods of harvesting.
- New products and processes are required to make high quality nutritious products with extended storage life.
- Marketing assistance is needed to acquaint the institutional and retail distribution systems with the new products.
- Another aspect of the development of unutilized and under-utilized species which would have to be overcome is the species nomenclature as controlled by FDA. Highly acceptable products will have trouble breaking into the market if they must be called such names as cancer crab, mullet, arrowtooth flounder, flathead sole, etc.

On a global basis the present world catch of 42 million tons of edible fish could probably double. U.S. technology and capital could help developing nations increase their catches.

Meat from the cancer, red and Jonah crab is visually identical to that of the popular blue crab. Since these crab meats could be interchangeable, a common name such as Atlantic crab meat would facilitate marketing and eliminate possible unnecessary confusion among consumers. Would require considerable coordination between NMFS and FDA.

Negative: These development activities, if successful, would need to be supplemented with improved management measures (discussed later) or they would lead to overfishing pressure similar to that experienced in traditional fisheries.

2. Increasing the Edible Product and Improving Quality and Efficiency in Seafood Processing (2-4 years)

a. Problem

An estimated 60 percent of the total edible weight of fish and shellfish is presently consumed. Much edible fish and shellfish meat is wasted because technology is not available to separate meat from the bone and handpicking is too costly. Mechanical separators have proven feasible in the poultry and meat industries. They are currently under development for selected fish species. In addition there are a number of other technological improvements that could be made in processing and handling seafood which would lead to higher quality, greater efficiency, and larger quantities of seafood.

Recently developed mechanical separators offer the potential for increasing the yield of edible product from some species of fish by as much as 50 percent more than can be obtained from fillets. While the general principles are known and equipment is available, the full exploitation of this technology requires certain steps. The recovery of additional fish meat is already practicable, but quality factors, principally color, limit the uses of this product.

b. Solution

Government-industry research and development grant program in the field of utilization technology. Some examples would be:

(a) Accelerated development of mechanical deboning and meat-picking processes as applied to a number of species, development and market-testing of products from chunks and pieces.

(b) Development and demonstration of shucking equipment for oysters, clams, and calico scallops.

(c) Accelerated development of crab pickers.

(d) Development of new systems for holding live lobsters and crabs onboard vessels.

(e) Depuration systems for mollusks.

(f) Disguising strong tastes of some seafoods.

(g) Improved freezing techniques.

(h) Improved packaging techniques.

(i) Although most trends in the food industry are toward convenience items, markets for bone-in, skin-on fish could probably be expanded. These products could represent lower costs to consumers.

c. Appraisal

Most of funds would be used for grants to particular segments of industry for work on specific problem areas; would stimulate industry to adopt new productivity increasing measures,

would greatly accelerate the present limited effort of both Government and industry on this type of activity. (NOAA, DOC is presently spending only about $400 thousand annually in this area.) Could have problem of proprietary vs public information. Private industry in most cases does not have excess reserves to put into these kinds of research and development.

To facilitate recognition and wider use of comminuted fish, nomenclature and standards need to be developed. This involves surveys, consumer understanding of proposed terminology, and consumer education to these new types of products.

d. Discussion

Positive: When a fish is filleted only about 30 percent of the weight of fish is consumed. If the remainder of the fish after filleting were put through a deboning machine, the yield could be increased to about 50 percent of the weight of the whole fish. Many species of soft-fleshed fish, not suitable for filleting, could be processed in this manner. A few deboning machines, previously used in the poultry industry are undergoing modifications and being experimented with by Government and private industry. In addition, several foreign-made machines are available for limited species. Government-supported grants would accelerate these activities and would center on improving quality of the fish flesh and developing new products. Deboning equipment could add 80 million pounds from species currently filleted.

Practically all crab meat is picked by hand with yields of 14 to 20 percent. Mechanical picking would increase these yields to 20 percent.

New systems for holding live crabs and lobsters could increase supplies by 10 to 20 percent. Mechanical shuckers for oysters, clams, and calico scallops would reduce processing costs by 20 to 30 percent and relieve pressure on the rapidly declining supply of labor for hand shucking.

Negative: Quality problems from the use of inferior parts of the fish may be difficult to overcome.

3. Developing Aquaculture (5-10 years)

a. Problem:

All known wild stocks of those major species of fish and shellfish in popular demand are being fished at maximum levels. The only way of increasing supplies of most of these species is through (a) the development of techniques for rearing these fish and shellfish under controlled conditions (closed systems), and (b) enhancement of existing wild stocks (such as by breeding and rearing juveniles in hatcheries to supplement those reared naturally (open systems). Some work is underway but very few developments have reached the state of commercial adoption. There are still too many uncertainties for private industry to undertake these developments on its own.

b. Solution:

(a) Expand and accelerate ongoing R & D work in aquaculture to develop new techniques for rearing fish and shellfish under controlled or semicontrolled conditions and longer-range developments in genetic manipulation, nutrition, diseases associated with confinement, etc. by Government. ($10 million, NOAA, DOC.)

(b) Matching-fund grant program for private industry for development and application of closed systems. ($10 million, NOAA, DOC.)

c. Appraisal:

(a) Solution a - Would not require new legislation and could be effected immediately. This work is long-run in nature with the payoff several years off. The present minimal effort in Government (about $ 2 million) should be accelerated significantly. This effort is highly critical to continued availability of many popular seafood items. The NMFS is seen as playing the major role in research and development for both open and closed aquaculture systems. Sea Grant could play a major role after the basic studies on genetic, food, and disease problems, etc. by working with industry in setting up pilot plants and prototype operations and in the application of the results of basic research. An existing example of the open system is the salmon hatchery which provides young fish to augment natural production and replace production from destroyed or polluted spawning beds. Further efforts should be directed to more fully developing the salmon sustaining stream of

the Pacific Northwest and Alaska. In addition research efforts should be devoted to determining the potential from seeding open areas with other species whose spawning and nursery grounds have been destroyed by society.

(b) Solution b - Would probably require new legislative authority; would stimulate industry to do more on its own. Probably as many as 50 companies are in various stages of experimental research and development of a number of species. In addition to freshwater trout, catfish, and private oyster beds, small commercial quantities of shrimp and salmon (fish reared to 1 pound in 12 months in enclosed areas) have been marketed this past year. Many problems remain to be solved, however.

d. Discussion

Positive: The limited number of aquacultural ventures that exist throughout the world today are indicative of the increases in fish and shellfish supplies that would be achieved if techniques could be further improved and extended to other species. This is the only way of expanding supplies for some species most in demand by consumers.

Negative: Because of the long-run nature of much of the work, benefits are hard to predict. There are institutional problems that would have to be overcome, particularly with respect to the closed systems. The gradual destruction and pollution of our estuaries plus the growth in competing uses (industrial and urban developments of our coastline, recreation, etc.) and the generally

poor system of allocating the marine environment among competing uses would tend to limit aquaculture opportunities (closed systems) in marine species.

B. Steps to Maintain Existing Stocks

1. Improve Fishery Management Systems

a. Problem

Fishery management systems are inadequate and incapable of coping with today's problems of allocating fishery resources among countries, among user groups and among fishermen as a group within the United States. The result generally has been inadequate controls on fishing pressures which lead to overfishing. To the extent controls are effective, they are the type of controls which tend to stifle economic efficiency and technological advancement in the commercial harvesting of fish and shellfish.

b. Solution

Raise attention of this matter to the highest level within Government, clearly delineate an effective national fishery policy and more actively pursue the legislation, cooperation with the States, and international agreements necessary to implement adequate management and regulatory procedures controlling this Nation's renewable fishery resources in cooperation with the States. This would particularly include:

(a) Actively support at a high level of Government the State-Federal Fisheries Management Program already underway in NOAA to address these institutiona changes.

Under this program three pieces of legislation are being considered. These are integral parts of the program and need high level support. Under consideration are bills (1) authorizing the Federal Government to manage fisheries in the contiguous zone and providing a mechanism for States and the Federal Government to cooperatively manage fisheries; (2) providing for grants to the States to cooperate with the Federal Government in revamping management procedures for individual fisheries; (3) establishing a uniform State code for fisheries management.

(b) Agressively take or negotiate effective measures to better protect the valuable fishery stocks off the U.S. coasts, and anadromous stocks, from foreign exploitation.

c. Appraisal

Solutions a and b must involve the closest of cooperation with the States since the bulk of the management rests with the States (a State has sole jurisdiction within 3 miles and also can regulate its own citizens beyond 3 miles). This solution probably will require such fundamental changes as shifting from a common-property concept of management (anyone is allowed to fish a resource which belongs to no one) to some system of property rights which can be bought and sold just like farm land. Such a system is more compatible with private enterprise and would encourage technological innovation. It would further encourage those with fishing rights to share in the burden of protecting and enhancing the resource. It would eliminate the potential problems of controlling too many fishermen fishing for too few fish.

Solution c should address three groups of resources: (1) those coastal species located off nations beyond 12 miles, (2) anadromous fish stocks which are hatched in rivers and streams but migrate far into the high seas for a portion of their life, and (3) highly migratory high seas resources.

Present U.S. policy regarding improved international fishery management being developed in preparation for the 1973 Law of the Sea Conference is attached.

d. Discussion

Positive: As population increases and the demand for fish products and recreational fishing increases, the more difficult the allocation of fixed fishery stocks becomes. The present system of management cannot cope with this problem. It must be changed or the problem of overfishing will become more severe.

The present jurisdictional split is incompatible with adequate management. Most fish stocks overlap two or more jurisdictions. There is presently no effective mechanism for cooperatively managing fisheries as among jurisdictional entities.

It is estimated that under an adequate system of allocating commercial fishery stocks through some system of private property about half of the labor and capital resources presently in fisheries could be released to other purposes. This would greatly improve productivity and reduce costs of harvesting fish.

Negative: Bringing about fundamental institutional changes is difficult to accomplish. Social adjustment will be necessary. The rapidity of the change in some fisheries may be dictated by the availability of labor and capital. Particular management schemes can be tailored to meet these problems.

2. Pollution Abatement

a. Problem:

Pollution has three broad effects detrimental to various segments of the fishing industry: (1) closure of fishing for various periods of time and by various areas: (2) prohibiting sale of products because of contamination; and (3) impact on mortality, growth, and reproduction rates of living marine resources. These effects are being more widely experienced. Knowledge concerning the significance of these effects particularly the third one, or of preventing and abating pollution is inadequate.

b. Solutions:

(a) Expanded research to determine causes of pollution, its effect on living marine resources, and effective measures for preventing it.

(b) Increased assistance to local communities for dealing with their problem of municipal and industrial wastes.

(c) Expanded effort to improve scientific basis for realistic regulations pertaining to pollution abatement and product safety and control.

c. Appraisal:

All solutions can be effected immediately with additional funding. The problem is presently being attacked but not rapidly enough. Will be costly to society. Many other benefits in addition to improved quality and continued availability of fishery products will result.

The only limitations presently imposed on contaminant levels in fish are those of mercury and pesticides. However, much worldwide research indicates serious possibilities that other trace elements (lead, cadmium, etc.) may have adverse public health implications at levels which may occur in fish. The Government is conducting surveys to determine levels which will provide a control basis if need arises, and allay public concern by thorough authoritative information on the occurrence of such trace elements in fish.

Costs of operation have risen sharply in recent years due to the effects of natural and man-made contaminants such as mercury and pesticides which are of public health concern. Additional costs result from the following:

a. Limits on resource (fishing area, size of fish).
b. Loss of product and consequent increase in raw material costs.
c. Increased handling cost needed for examination.
d. Cost of examination.
e. Impact on consumer usage.

d. Discussion

Positive: It is estimated that at any one time as much as 20 percent of the oyster grounds are closed because of pollution. This is generally due to pollution caused by municipal wastes. A $25 million trade flow of swordfish has been wiped out because of mercury levels higher than FDA guidelines. Millions of pounds of other fish which tend to accumulate pesticides, mercury and other heavy metals must now be closely monitored. The testing itself is costly. In addition it brings about extra storage costs while the fish are held for testing. These losses are in addition to those caused by natural mortality of fishery resources because of pollution which cannot currently be measured. Accelerated pollution abatement would reduce these losses.

Negative: Pollution abatement will be costly for many firms and municipalities. Marginal firms (including fishery vessels and processors) may not be able to bear the costs and will be forced to cease operations. Solutions proposed here will be slow to produce results.

C. Steps to Reduce Costs with Existing Supplies

1. Purchase of Foreign-Built Vessels

a. Problem

A. U.S. fisherman may not land his catch in a U.S. port if his fishing vessel was purchased in a foreign country. This regulation dates back to a 1793 law passed to protect the domestic shipbuilding industry.

b. Solution: Repeal the legislation.

c. Appraisal: Repeal of the legislation would enable U.S. fishermen to purchase foreign-built vessels. The cost differential between U.S. and foreign-built vessels varies depending on type of vessel with the foreign-built vessel being up to 50 percent lower in cost than a comparable vessel built in the United States. Foreign vessels would not be purchased in all fisheries. Tuna and shrimp vessels constructed in the United States are the best in the world. In fact, shrimp vessels are exported to other countries. For some U.S.-made vessels, the quality of construction makes them preferred even though they may cost more than foreign-built vessels.

d. Discussion

Positive: Considerable savings would accrue to domestic vessel owners, this being reflected in their cost per unit of product. In addition, this would encourage replacement of obsolete inefficient vessels. It also might improve their access to the latest sophisticated fishing gear and equipment.

Negative: This improvement in productivity and catching capability unless carried out in conjunction with an improved fishery management regime could compound the problem of overfishing in some fisheries. Lowering vessel costs would likely encourage additional entry into fisheries if there is no adequate control of effort.

There would be severe opposition to this action by the U.S. shipbuilding industry. This was attempted once before but could not be done politically. In lieu of an earlier repeal there was established in 1960 a Construction Subsidy Program to offset this cost differential. This proved very costly however. The Act expired in 1972 after subsidizing only 43 vessels at a cost of $30 million.

Although lowering the purchase price for a fishing vessel would improve returns to the vessel owner, it would not necessarily mean lower seafood prices to consumers, because it likely would not result in expanded supplies. This action would increase the flow of dollars to foreign sources.

2. High Insurance Costs

a. Problem

Insurance costs for fishing vessels, both hull and P&I (protection and indemnity), are extremely high and coverage is becoming increasingly difficult to obtain at any price. There are few domestic insurers. Principal reasons for this are: (1) unsafe vessels and operating conditions causing high rate of accidents, (2) lack of actuarial information as basis for establishing rates, (3) generous jury verdicts and broad court interpretations of the maritime law which hold vessel owners liable for all injuries to crewmen whether job-related or not.

b. Solutions

(a) Establishment and enforcement of safety standards for vessels and safety training for vessel crews ($2 million Coast Guard, DOT).

(b) A Government supported reinsurance function to cover excess losses and a central actuarial function to evaluate risks.

(c) Study of the feasibility of exempting fishing vessels from the liability provisions of the maritime laws and bringing fishermen under workmen's compensation.

c. Appraisal

Solution (a) would result in safety standards for construction and operation of vessels which the fishing industry has never had. This would result in a significant reduction in the rate of accidents, the number of casualties, and the claims for damages and injuries. The Coast Guard is now exploring the possibility of a program but needs pushing.

Solution (b) would spread the risk through re-insurance, provide actuarial information for establishing realistic rates and thus improve the incentive for insurers to cover this industry.

Solution (c) would explore possibilities for reducing the exorbitant liability claims many of which are dissipated in the form of legal fees and court costs.

d. Discussion

Positive: Insurance costs average 5 to 7 percent of the total cost of operating fishing vessels, excluding depreciation. A strong safety program could reduce accidents by 50 percent according to a Coast Guard study. A Government-backed self-supporting program of reinsurance could cut rates as much as 15 percent.

A reduction of 30 to 35 percent in insurance costs would mean an overall reduction in vessel operating costs of about 2 percent.

Following are examples of the magnitude as well as the escalating nature of insurance costs for three relatively modern and efficient fishing fleets:

Fishery	Insurance Cost Per Man Day at Sea		Percent Change
	1960	1968	
New England Scallops	$3.11	$4.80	54.3
	1964	1968	
Gulf of Mexico Shrimp	$3.21	$7.00	118.1
	1962	1967	
California Tuna	$5.64	$10.18	80.5

Much of this problem is largely beyond the ability of independent vessel owners to solve. Insurance costs are susceptable to a degree of potential control by Government not applicable to most other costs.

Negative: The safety program would impose immediate additional costs on the industry thus probably increasing total costs for a time. It would probably force a significant number of old obsolete vessels out of operation.

There would be serious opposition from the maritime industry and seamen's union to attempt to exempt fishermen from the provisions of the maritime laws.

3. Improved Business Practices in Fishing Operations

a. Problem

Business practices and operations of many of the 81,000 vessel and boat operators and small processors are poor and inefficient.

b. Solutions:

(1) A much stronger program of business management extension education than now exists.

(2) Expand data to fishing fleets on current sea conditions and likely locations of fish stocks.

c. Appraisal:

Solution (1) would make small operators aware of their costs and opportunities for reducing them. A minimal program recently initiated in this area through new Sea Grant Program needs expanding.

Solution (2) now provides daily information on location of albacore tuna during season to the albacore fleet. Recently NMFS began to telefax weather maps to vessels of the U.S. yellowfin/skipjack tuna fleet. Expanded efforts to provide information on sea surface

and water temperatures will help fleets locate fish in less time than at present. Reducing their search time will increase their productivity per day at sea.

d. Discussion

Positive: Many small independent operators are not even aware of their costs. Many opportunities exist for improvements.

Negative: Independent operating customs of domestic fishermen will be difficult to change. Improved efficiencies and reduced costs may not be readily passed along to consumers since total supplies are relatively fixed.

Many fishing operations are seasonal and part-time. Thus many operators view their work almost as an avocation thus are not particularly interested in making larger profits.

The solutions advanced here will tend to put domestic fishing fleets in a stronger position with increases in their catches. Without management of our living marine resources, however, their more effective effort could lead to overfishing.

4. High Tariffs on Fishing Nets and Netting

a. Problem

The ad valorem duty on complete fish nets and the netting used in making nets runs as high as 50 percent. This

discourages the use of many foreign nets and netting, particularly those made of synthetic materials, and also serves to keep prices of domestic nets at a high level.

b. Solutions

(a) Abolish tariffs.

(b) Lower tariffs.

c. Appraisal: Abolishment of the tariffs would be the most effective solution for the U.S. fishing industry; however, a reduction would help lower costs.

d. Discussion

Positive: Fish nets and netting can run as high as 8 percent of a fishing vessel's operating expenses. Elimination of the tariffs on these items could cut fishing costs by 3 to 4 percent.

Negative: Materially reducing or eliminating tariffs would bring strong opposition from U.S. manufacturers of fish nets and netting. Part of the production of 11 manufacturers with a total employment of about 500 people would be affected by this action. This industry has been able to mount a forceful lobby and block previous attempts to reduce these tariffs. Dollars would flow overseas for the purchase of fish nets.

Unadjusted production, man-year, and labor productivity indices for all U.S. fisheries, 1950-1969, 1971

Year	Unadjusted production index 1/	Unadjusted man-year index 2/	Labor productivity index
	(1)	(2)	(1) ÷ (2) / 100
	Base: 1967 = 100		
1950	120.4	122.5	98.3
1951	108.9	117.9	92.4
1952	108.9	115.0	94.7
1953	110.2	116.0	95.0
1954	117.0	109.7	106.7
1955	118.1	109.5	107.9
1956	129.4	109.4	120.5
1957)	117.6	104.8	112.2
1958) (4,886)	116.7	97.8	119.3
1959)	125.8	97.8	128.6
1960	121.4	98.9	122.8
1961	127.5	98.3	129.7
1962	131.6	95.8	137.4
1963	119.1	97.4	122.3
1964	111.5	96.9	115.1
1965	117.4	97.5	120.4
1966	107.3	102.9	104.3
1967 (4,055)	100.0	100.0	100.0
1968 (4,160)	102.6	97.5	105.2
1969 (4,337)	107.0	100.5	106.5
1970 (4,907)	121.0	NA	NA
1971 (4,969)	122.5	111.7	109.7 3/

1/ Total number of pounds of fish landed unadjusted for species mix composition (i.e., the commonly reported national figure on fish catch).
2/ Total number of fishermen employed in the harvesting sector.
3/ Total of full time and part time. A better index of productivity would be one based on production of full-time fishermen which accounts for the majority of the catch.

Source: Fisheries of the United States.