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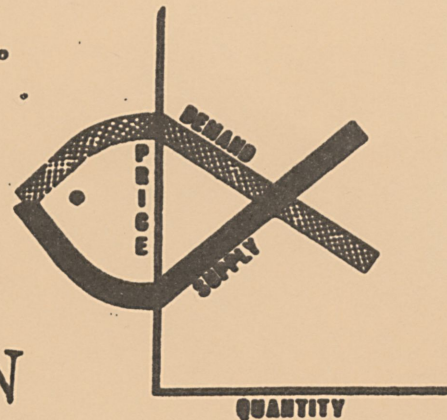
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Estimated Economic Impact of Declaring
Shrimp and Lobsters to be Creatures
of the Continental Shelf

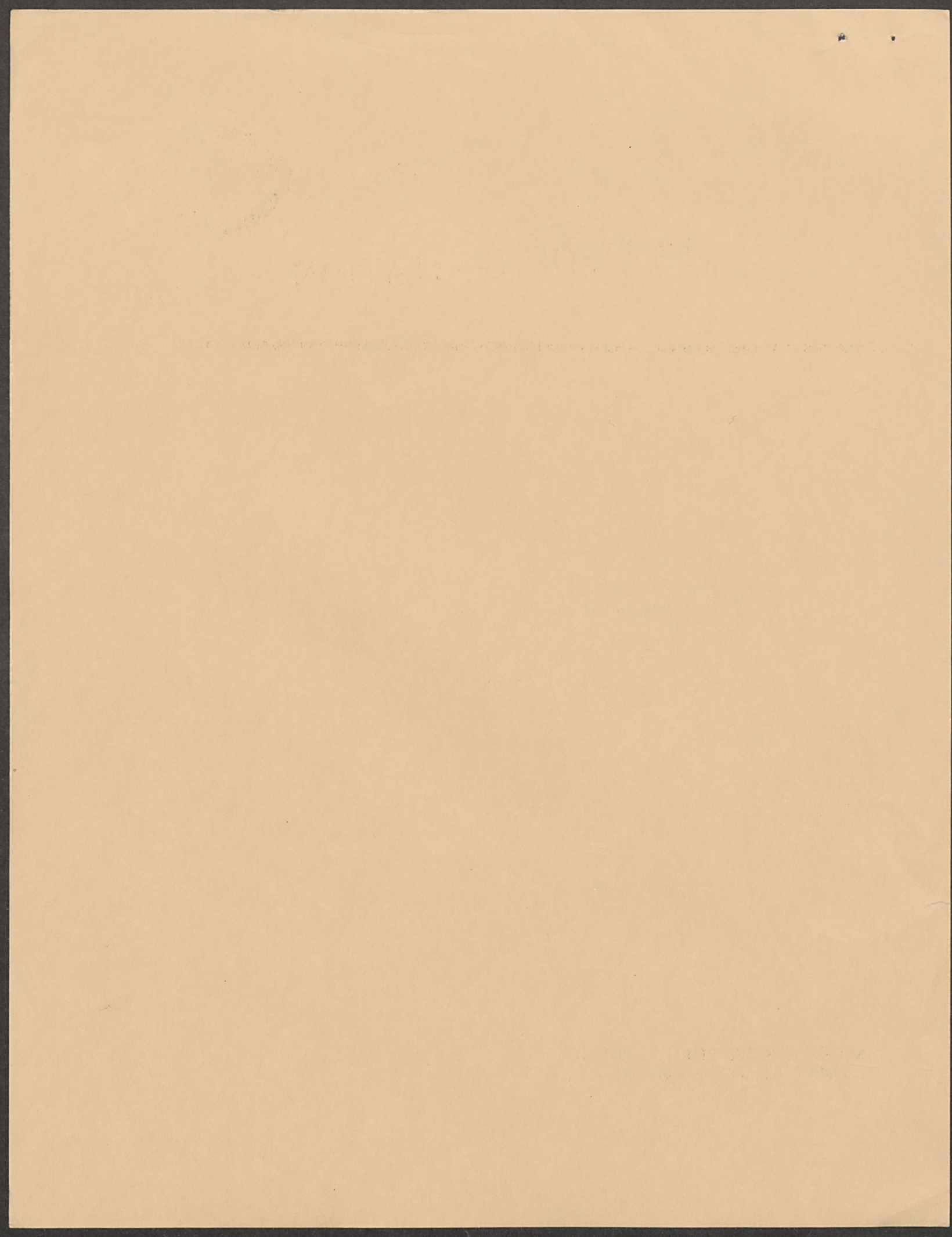
by

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U.S. NATIONAL MARINE FISHERIES SERVICE
ECONOMIC RESEARCH LABORATORY



This work is in the process of review. All results are highly preliminary and subject to change upon further analysis.

Preliminary Report
Not for Quotation

ESTIMATED ECONOMIC IMPACT OF DECLARING
SHRIMP AND LOBSTERS TO BE CREATURES
OF THE CONTINENTAL SHELF

by

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Draft of May 12, 1972

ESTIMATED ECONOMIC IMPACT OF DECLARING LOBSTERS

TO BE

CREATURES OF THE CONTINENTAL SHELF

by

John Vondruska

Introduction and Summary

The purpose of this report is to provide an estimate of the economic impact of declaring lobsters to be creatures of the continental shelf. Based on several restrictive assumptions, it is estimated that the net change in value to the U.S. economy could range from about zero to \$16-20 million, more or less, as follows:

<u>Constraint</u>	<u>Net Value Change (\$ millions)</u>
A. U.S. and relevant foreign fishing activity for shrimp and lobsters restricted to respective national continental shelf and slope areas	-2.1 to 1.1
B. Foreign shrimp and lobster fishing activity on U.S. continental shelf and slope areas ceases; U.S. activity abroad continues as at present	16.1 to 20.1
C. Foreign lobster fishing on U.S. continental shelf and slope areas ceases; other U.S. and foreign fishing activity for shrimp and lobsters continues as at present	5.7 to 10.6

Of these constraints (described in more detail in Appendix, Table 5), B or C seems to be the most plausible judging by discussions with several people in NMFS and NOAA. 1/

1/ Under Constraint A, it is assumed that U.S. action in declaring lobsters to be creatures of the continental shelf would lead other

No attempt has been made to assess the net change in wages, profits, and other earnings accruing to U.S. domestic fishermen and vessel operators. Nor has any attempt been made to assess the impact of increased fishing effort on the shrimp fish resource of the U.S. South Atlantic and Gulf Coast continental shelf under Constraint A. It should be noted that the U.S. shrimp fishery in the South Atlantic and Gulf Coast area is fully capitalized or overcapitalized, even without being constrained to U.S. continental shelf areas, in the judgment of the NMFS Director's Task Force on Capitalization of the Fisheries. Supporting data for several of the affected fisheries are shown in Appendix Tables 1-5.

Footnote 1 continued

countries to make broader declarations embracing both spiny lobsters and shrimp. It is further assumed that such declarations would restrict fishermen to the continental shelf and slope of their own countries. These assumptions were discussed with Henry Beasley, Chief, Marine Resources Division, National Oceanic and Atmospheric Administration (April 24, 1972). Of course, such declarations require enforcement, for which costs are not counted here. Also, lobsters and shrimp could still be taken as incidental catch by fishermen of other nations during trawling operations for other fish.

Alternatively, other assumptions are possible. For example, there is precedent for making bilateral or multilateral agreements with other nations to allow their fishermen to operate in waters otherwise reserved for U.S. fishermen. Usually this involves some sort of compensation.

Background

The reason for making these estimates is that NMFS and NOAA have been requested to develop a program relative to several possible policy changes that could affect New England fishermen. The declaration of lobsters to be creatures of the continental shelf and slope is but one of these possible policy changes.

Of course, such possible policy changes affect fishermen in regions other than New England. The net value changes to the U.S. economy already presented and subsequent discussion concern the several regions where shrimp and lobster fishing are important. Incidentally, it was learned that there may be some disagreement among U.S. shrimp fishermen in the Gulf about their interests in possible U.S. declaration of shrimp to be creatures of the continental shelf. Some "local" Gulf shrimp fishermen who operate exclusively or primarily in U.S. continental shelf and slope areas, have expressed concern about the threat of loss from increasing foreign fishing activity in this fishing area. Apparently they are more concerned about this than with what is in their view a less imminent loss to them from possible return of U.S.-flag vessels from "high seas off foreign shores" fishing. 2/

2/ Based on comments by George Snow, NMFS Statistics and Market News Division, New Orleans, May 4, 1972. In 1971, the "high seas off foreign shores" catch \$11.9 million, accounted for 8.7 percent of the value of shrimp landing in U.S. Gulf ports (NMFS, Fisheries of the United States, 1971). This does not include the value of catch by U.S.-owned vessels in Latin America, \$30.4 million in 1970 (lower in 1971 due to temporary closure of the shrimp fishery off Brazil).

There appears to be mixed feeling about U.S.-flag and U.S.-owned fishing vessel harvesting and U.S.-owned processing plant activity for spiny lobsters and shrimp in Latin America. One view is that since U.S. interests are in these countries, economically benefiting the local economies, it is thought that this arrangement will continue in the "short run" regardless of U.S. declarations of lobsters or shrimp to be creatures of the continental shelf to protect U.S. fishermen. However, the U.S.-owned fish harvesting and processing activity may decline in relative importance in these countries, if return on investment continues to be maintained by strong U.S. and other countries' import demand, and if local investment funds are available. 3/

3/ Based on comments by Jack Greenfield, NMFS regional economist, St. Petersburg, Florida; Lloyd Johnson, NMFS biologist, Southeast Region, Miami, Florida; and David Windley, NMFS foreign affairs officer, International Activities Staff (Foreign Fisheries).

New England Shrimp and Northern
Lobster Fisheries

U.S. landings of northern lobsters have been stable at around 30 million pounds since 1955. The inshore fishery accounts for most of this, and the offshore trawl fishery accounts for about 5 million pounds. The expected increase is associated with the offshore pot fishery. The offshore fishery extends its operations 60-200 miles from shore in water depths of 50-250 fathoms or more. This includes areas of the continental shelf and slope.

The New England shrimp fishery, like its counterparts in other cold water regions, is not well understood biologically. Past estimates of maximum sustainable yield appear to have been conservative (see Appendix Table 4, footnote 4). Recent landings may or may not represent the potential for this fishery, but it is assumed here that 1970 landings do represent the potential. Based on this assumption, gains for the New England area associated with any declaration of shrimp and/or lobsters as creatures of the continental shelf relate primarily to lobsters.

South Atlantic, Gulf Coast, and Caribbean
Area Spiny Lobster and Shrimp Fisheries

Shrimp landings in U.S. ports do not account for all of the landings by U.S.-flag vessels (Appendix Table 1). Landings by U.S.-owned vessels in Latin American ports have increased from about 7 to 50 million

pounds, 1960-70. 4/ Besides the portion of landings in U.S. Gulf Coast ports that come from foreign waters (notably off the Mexican Coast), the landings by U.S.-flag vessels in Latin American ports are assumed to be curtailed only under Constraint A, but not under Constraints B and C in the event of declaring lobsters to be creatures of the continental shelf.

The Caribbean shrimp fishery was opened after exploratory work by Bureau of Commercial Fisheries (now NMFS) research vessels. Mexican and Cuban shrimp vessel catches have not been taken into account here. Fuss estimated Mexican shrimp catch of 2.8 million pounds, valued at \$1.3 million off the Texas Coast for the period October 1970 to October 1971. The Cuban catch on the Tortugas grounds was estimated as 158,000 pounds, valued at \$74,000 for the same period. 5/

4/ A substantial decline occurred in 1971, see Appendix Table 1. Note that landings data are not available for years prior to 1968, but that U.S. imports may be used to approximate landings by U.S.-owned vessels.

5/ Charles M. Fuss, Jr. "Foreign Fishing off the Southeastern United States Under the Currently Accepted Contiguous Sea Limitations" (unpublished NMFS paper; St. Petersburg, Florida, NMFS Southeast Region Enforcement and Surveillance Division).

The spiny lobster fishery apparently has some unharvested potential for the Atlantic West Central FAO-designated region as a whole. FAO data on country landings indicate that Cuba is the leading harvester in this region for the 1964-70 period. 6/ U.S. vessels operating from Gulf Coast ports obtained most of their catch in the high seas off foreign coasts in 1968-69, but shifted to a greater dependence on resources off U.S. coasts in 1970-71 (Appendix Table 2). There are three segments to the U.S.-flag vessel spiny lobster fishery. The first operates from Miami and the upper keys area of Florida, and apparently involves fishing by Cuban expatriots who have not yet acquired U.S. citizenship. The second segment of the spiny lobster fishery is in the Key West and lower keys area of Florida and involves fishing in U.S. waters. These first two segments result in U.S. landings only. The third segment is not precisely defined, but U.S.-flag vessel operations are thought to be responsible for 90-95 percent of U.S. spiny lobster imports from the general Caribbean area, meaning most of the Latin American area from Brazil northward. This is in addition to partially U.S.-owned harvesting and processing operations in Mexico. 7/

6/ FAO Yearbook of Fishery Statistics, 1970, vol. 30 (Rome: 1971).

7/ Comments on spiny lobsters are based on discussion with Jack Greenfield, NMFS regional economist, St. Petersburg, Florida, on May 11, 1972, and by Lloyd Johnson, NMFS fisheries biologist, Miami, Florida, on May 12, 1972. Johnson is preparing a special draft report on the spiny lobster fishery, due May 12, 1972, for the NMFS Southeast Region Associate Director, Harold Allen. However, Johnson has not yet completed a detailed enumeration of vessel operations in individual countries. The restriction of the Bahamas area to U.S. fishermen affected the spiny lobster fishery. In Johnson's view, the harvest potential in the Florida area has been achieved, as has about 80-90 percent of the Bahama potential, but other areas of the Caribbean appear to have unharvested potential.

Pacific Shrimp Fisheries

The Pacific Coast shrimp fishery extends from California to Alaska and adjoins its Asian counterpart in the Bering Sea. The Alaskan shrimp fishery is the one most important to U.S. fishermen. As with the cold water U.S. shrimp fishery in New England, the Pacific Coast shrimp fishery does not appear to be well understood biologically, meaning that potential yield estimates may be questioned. These fisheries are given to yield fluctuations. During the early 1960's, foreign landings exceeded those by U.S. fishermen in the Alaskan area, but then declined, apparently because of the fish resource. Yet, U.S. landings have increased and approximated the combined U.S.-foreign peak (85.3 million pounds, 1963) in 1970 (Appendix Table 3).

Restricting the Alaskan shrimp fishery to U.S. fishermen would be to their benefit, but the shrimp are lower in price than shrimp harvested elsewhere.

Appendix Table 1.--U.S.-Flag Shrimp Vessel Landings Off U.S. Coasts, Foreign Coasts, and in Selected Ports, 1960-71

	Total U.S. Landings ^{1/}	Gulf Landings ^{1/}			U.S.-Flag Vessel Activity in Latin America ^{2/}	
		Off U.S. Coast	High Seas Off Foreign Coasts	Total	Landings	U.S. Imports
-----Thousand pounds, round weight-----						
1960	249,452	178,555	27,170	205,725		7,010
1961	174,530	99,600	34,200	133,800		7,586
1962	191,105	110,600	31,100	141,700		11,346
1963	240,478	177,900	25,200	203,100		18,061
1964	211,821	149,000	30,000	179,000		21,907
1965	243,645	166,805	28,432	195,237		29,424
1966	239,046	162,182	17,048	179,230		36,080
1967	307,787	208,887	16,844	225,731		43,302
1968	299,289	180,701	23,323	204,024		48,307
1969	318,537	184,770	13,630	198,400	47,900	45,887
1970	367,469	216,110	14,590	230,700	48,800	46,166
1971	387,932	211,584	15,499	242,582	17,500	36,554

^{1/} Source: NMFS (formerly BCF), Fishery Statistics of the United States, annual editions, 1960-68; Fisheries of the United States, annual editions, 1969-1971 (Washington, D.C.).

^{2/} Landings by U.S.-flag vessels operating out of ports in Trinidad, Barbados, Guyana, Surinam, Nicaragua, and French Guiana are shown in Fisheries of the United States, 1970, p. xiii, for 1969 and 1970 only. These landings result primarily in exports from these countries to the United States. U.S. imports from these countries have been converted to round weight using the factor 1.59. Product weight import data for these countries are from: BCF (now NMFS), Historical Statistics--Shrimp Fishery, (Washington, D.C., May 1967); BCF (now NMFS) or NMFS, Shellfish Situation and Outlook, 1969 and 1970 annual review editions, Current Economic Analysis reports S-16 and S-70 (Washington, D.C., 1970 and 1971); NMFS, Fisheries of the United States, 1971 (Washington, D.C., 1972).

Appendix Table 2.--U.S. Spiny Lobster Landings, 1960-71

	Total U.S. Landings 1/	Gulf Landings		Total Landings
		Off U.S. Coast	High Seas Off Foreign Coasts	
- - - - - Thousand pounds - round weight - - - - -				
1960	3,210			
1961	3,235			
1962	3,664			
1963	4,180			
1964	4,088			
1965	6,237			
1966	5,844			
1967	4,868			
1968	7,476	198	3,813	3,921
1969	8,781	94	4,406	4,500
1970 1/	10,346	3,676	3,176	6,852
1971 1/	8,439	3,521	^{2/} 1,183	4,704

1/ Revised or preliminary data from NMFS Statistics and Market News Division.

2/ Total U.S. "high seas off foreign shores" landings in 1971 amounted to 4.039 million pounds, valued at \$3.673 million (preliminary data), as shown in NMFS, Fisheries of the United States, 1971 (Washington, D.C.: March 1972).

Source: NMFS (formerly BCF), Fisheries of the United States, annual editions, 1960-1970 (Washington, D. C.)

Appendix Table 3-- U.S. and Foreign Vessel Shrimp Landings in the Alaskan Areas.

	Landings by U.S. fishermen	Landings by foreign fishermen	Total landings
-----Million pounds, round-----			
1960	7.4	-	-
1961	16.0	22.8	38.8
1962	16.9	46.8	63.7
1963	15.1	70.2	85.3
1964	7.7	54.1	61.8
1965	16.8	30.7	47.5
1966	28.2	30.6	58.8
1967	41.8	34.6	76.4
1968	42.1	9.2 ^{1/}	51.3
1969	47.8	7.0 ^{1/}	54.8
1970 ^{2/}	74.0	6.0 ^{1/}	80.0

Source: "Alaska's Shrimp Industry," Alaska Review of Business and Economic Conditions (University of Alaska, Institute of Social, Economic and Government Research), vol. 8, no. 2, July 1971.

^{1/}Footnote in source: Data on foreign shrimping from U.S. NMFS (formerly BCF) based on exchanged data with Japanese and Russian authorities plus the reports of U.S. surveillance teams. Values are not available for these harvests. The 1969 and 1970 figures are solely surveillance activity estimates from U.S. NMFS.

^{2/}All figures estimated or preliminary.

Appendix Table 4.--Shrimp and Lobster Landings, 1970 and Maximum Sustainable Yield

Fishery	U.S.-Flag Vessel Landings, 1970 ^{1/}			Maximum Sustainable Yield ^{2/}
	Off U.S. Coast	High Seas Off Foreign Coast	Total	
-----Million pounds, round weight-----				
Northern lobsters	34.2	0	34.2	40-45 ^{3/}
New England shrimp	23.5	0	23.5	- ^{4/}
Spiny lobsters, Atlantic West Cent. FAO Region	-	-	-	46
Gulf and South Atlantic Shrimp, Southeast Atlantic West	7.1	3.2	10.3	-
Central FAO Region ^{5/}	236.5	63.4	299.9	353
Gulf & South Atlantic Shrimp, Pacific	236.5	14.6	251.1	251.1 ^{6/}
Bering Sea & Gulf of Alaska	92.9	-	92.9	253
Other U.S. Pacific	74.4	-	74.4	220
	17.5	-	17.5	33

^{1/} Source: NMFS, Fisheries of the United States, 1970 or NMFS Statistics and Market News Division

^{2/} Source, except as noted: A.R. Longhurst, "Crustacean Resources" in J.A. Gulland, compiler and editor, The Fish Resources of the Ocean, FAO Fisheries Technical Paper No. 97, FIRS/T97 (Rome, Italy: FAO, July 1970).

^{3/} Longhurst estimates MSY of 70.5 million pounds for the FAO region Northwest Atlantic. The 40-45 million pound MSY estimate for New England is from NMFS, "Joint Master Plan for the Northern Lobster Fishery" (unpublished, for NMFS Administrative Use Only, 1969).

^{4/} Longhurst estimated landings would reach 11 million pounds off the New England Coast on the basis of 1960-67 landings data.

^{5/} U.S. landings in Gulf and South Atlantic ports plus landings by U.S.-flag vessels (48.8 million pounds) in Barbados, Guyana, Surinam, Nicaragua, and French Guiana ports totaled 299.4 million pounds in 1970.

^{6/} This fishery is reported to be fully capitalized or overcapitalized according to the NMFS Task Force on Capitalization of the Fisheries. That is, MSY is approximately equal to landings.

Appendix Table 5.--U.S.-Flag Vessel Landings, Actual and Estimated with Constraints, and Related Estimated Net Value Changes to the U.S. Economy, Shrimp and Lobsters, 1970 ^{1/}

Fishery	U.S.-Flag Vessel Landings		Value of U.S.-Flag Vessel Landings		
	1970	With Constraint	: 1970	With Constraint	Net Change
	Million lbs.	round weight	-----	\$ millions	-----
Northern lobsters	34.2	40 to 45	33.5	39.2 to 44.1	5.7 to 10.6
New England shrimp	23.6	30	4.7	5.6	0.9
Spiny lobsters:					
Gulf & So. Atlantic	10.3	7.1	6.3	4.3	-2.0
Shrimp: Southeast Atlantic, West Central					
FAO region ^{2/}	299.9	236.5	152.0	112.6	-39.4
Gulf & So. Atlantic ^{3/}	(251.1)	(236.5)	(119.6)	(112.6)	(-7.0)
Shrimp: Pacific	92.9	253.0	5.5	15.0	9.5
Total	--	--	202.0	176.7 to 181.6	-20.4 to -25.3
Net value change, U.S. ^{4/}					
Constraint A	--	--	--	--	- 2.1 to 1.1
Constraint B	--	--	--	--	16.1 to 20.1

^{1/} Under Constraint A, it is assumed that U.S. shrimp and lobster fishing activity is restricted to U.S. continental shelf and slope areas and that foreign shrimp and lobster activity is prevented in these areas. Other assumed effects of declaring landings under this constraint are 1970 landings or estimated maximum sustainable yields (see Appendix Table 4).

The net change in value to the U.S. economy is estimated for two constraints, Constraint A corresponding to the situation just described. Under Constraint B U.S. fishing activity (by U.S.-flag or other U.S.-owned fishing vessels) is assumed to continue on the continental slope and shelf areas of other countries, but foreign fishing activity is assumed to be prevented on U.S. continental slope and shelf areas. That is, under "A", there would be no "high seas off foreign shores" catch and no landings by U.S.-flag and other U.S.-owned vessels operating out of foreign ports, but under "B" there would be.

^{2/} The FAO-designated "Atlantic West Central" fishing region, also called region 31, is one of 26 major international fishing areas defined for statistical purposes. Biologists have used these regions in estimating maximum sustainable yields for various fish stocks. This region extends from a northern boundary at about 35° north latitude (about Cape Hatteras) to a southern boundary at about 5° north latitude (excluding a portion of the shrimp fishery in the Amazon River region);

Appendix Table 5.--U.S.-Flag Vessel Landings, Actual and Estimated with Constraints, and Related Estimated Net Value Changes to the U.S. Economy, Shrimp and Lobsters, 1970 (continued)

it has an eastern boundary in the mid-Atlantic Ocean (about 40° west longitude). See FAO, Yearbook of Fishery Statistics, 1970, vol. 30 (Rome: 1971), p. vii and map.

- 3/ Figures counted in figures immediately above and not added in total twice.
- 4/ The net change in value to the U.S. economy is estimated for constraints A and B, described in footnote 1. For constraint A, net changes in U.S. landings are counted directly with a deduction \$6-9 million for the assumed loss of payments to U.S. captains of fishing vessels and to U.S. owners of vessels and plants operating in the "Guianas" shrimp fishery.

The U.S. loss due to assumed closure of the "Guianas" shrimp fishery is computed as follows: Return on investment, estimated as 13.4 percent of vessel investment (260 vessels at \$80,000 each, or \$20.8 million), \$2.8 million; 13.4 percent of plant investment (\$8 - 13 million, depending on interpretation of Gross' data as to the degree of U.S. ownership), \$1-2 million; total, \$4-5 million. Gross gives a 1970 value of shrimp production in the Guianas of \$25 million, and U.S. imports totaled \$24.7 million (NMFS, Fisheries of the United States, 1971). Data from Erwin Penn, "Price Spreads and Cost Analysis for Fishery Products at Different Marketing Levels" (to be published) is the basis for estimating an ex-vessel value of \$16.2 million for \$24.7 million value of imports, although Penn's data apply strictly to the U.S. domestic industry. Of the ex-vessel value, 30-40 percent may go to the crew, and 40-45 percent of this crew share to the captains, or \$2-3.5 million to captains, judging by NMFS Economic Research Laboratory data for U.S. shrimp vessels operating out of U.S. ports in the Gulf of Mexico. Data on "Guianas" shrimp fishery are from: George Gross (U.S. regional fishery attache, Mexico City, correspondence on a field survey of May 11-27, 1971).

