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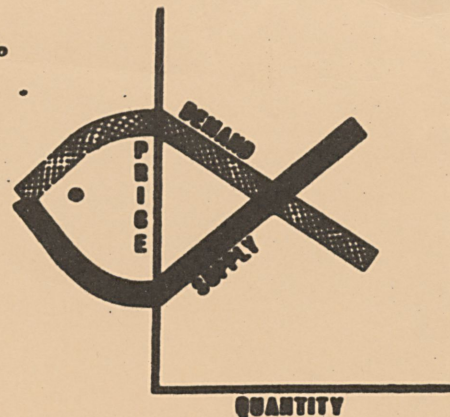
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ECONOMIC IMPACT OF NORTHERN LOBSTER

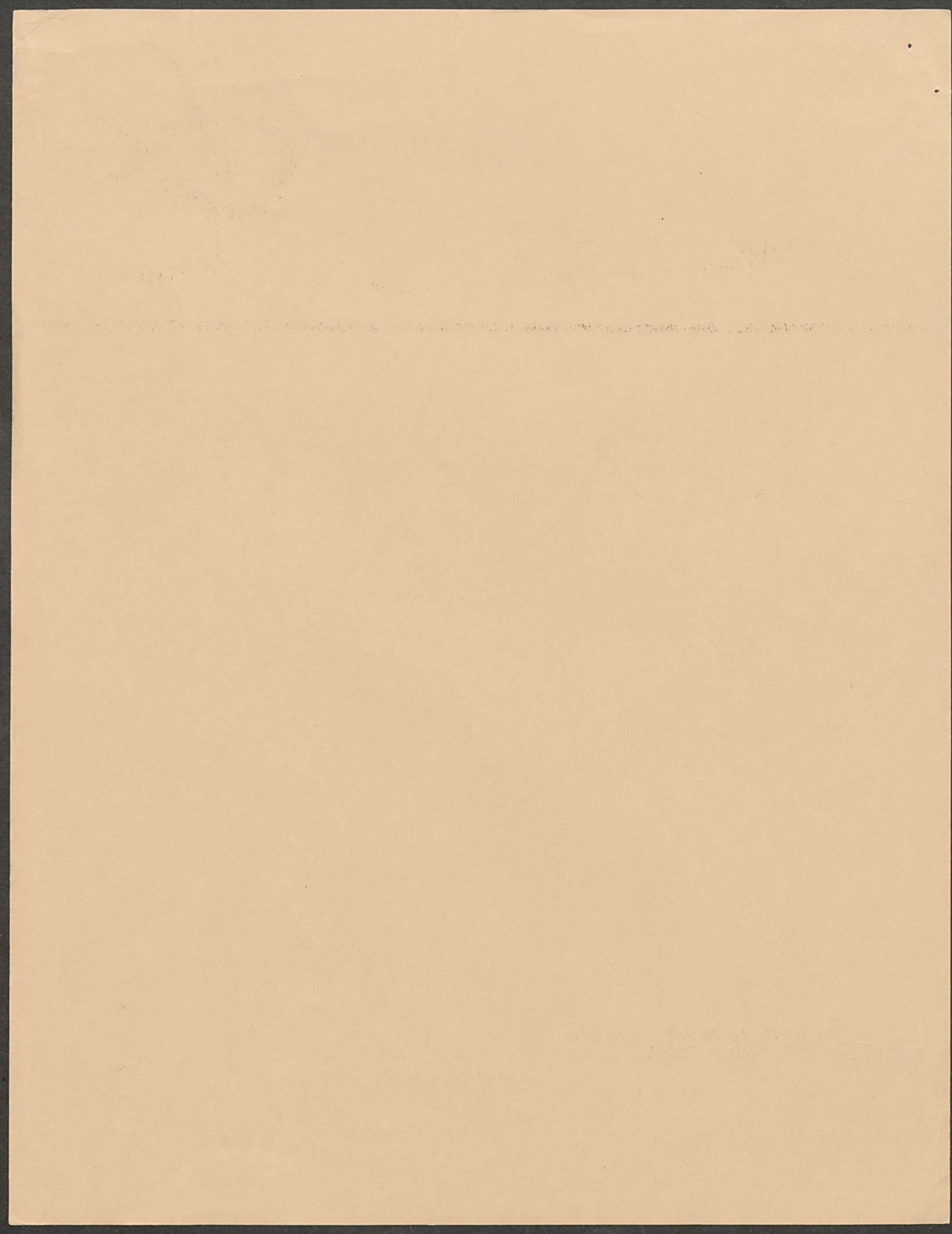
FISHERY IN MAINE

by

Erwin S. Penn

File Manuscript No. 86  
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US NATIONAL MARINE FISHERIES SERVICE  
ECONOMIC RESEARCH LABORATORY



Economic Impact of Northern Lobster Fishery in Maine

The northern lobster fishery is one of the major economic activities in Maine. The following analysis is presented to show the estimated effects on the State economy based on the income generated by this industry. As will be shown, this industry contributed about \$54.3 million to personal income of the residents of Maine in 1970 in addition to other forms of economic and social benefits. The lobster fishery is interpreted to include not only the fishing operations but also processing, exports to other States, and tourists attracted to the State as a result of the lobster fishery. This primary economic activity provides income to its own sector which in return buys goods and services from other sectors to generate income throughout the economy.

There were 19.5 million pounds of northern lobsters landed in Maine in 1970. About 15% of the catch was sold directly to tourists without being registered as landings.<sup>1</sup> The total landings would more likely be 22.9 million pounds, accounting for 75% of total U.S. landings in 1970. The northern lobster fishery in Maine provided employment for about 4,310 inshore boats and 30 offshore vessels and 5,200 to 5,400 fishermen in recent years.

I. Income Generated by the Northern Lobster Fishery

Maine residents consumed 8.7 times more northern lobsters than the national per capita consumption. In 1970, an estimated 550,000

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<sup>1</sup> Statement by Robert Dow, Department of Sea and Shore Fisheries, State of Maine.

pounds (or 2,475,000 pounds live weight) were consumed by Maine households--about 11% of total Maine landings (table 4).

In the early 1960's about 13% of northern lobster landings were processed into canned and packaged products. In 1968 processed products of northern lobsters were reduced to only 4.3 % of their landings and 3.5% of all seafoods processed in the State (see tables 1, 2, and 3). Consumers prefer live lobsters. Only the damaged and dying lobsters are processed; the remainder are marketed alive. In 1970 about 19.7 million pounds were sold alive; only 1.0 million pounds were processed and 2.2 million pounds were marketed through restaurants. This resulted in a total value<sup>2</sup> of \$26.5 million. After the deduction of local consumption, about \$24.1 million of northern lobsters were exported (tables 3 and 4).

Of this total value of \$24.1 million, about 48% was paid to fishermen as wages. The remainder was spent in operating expenses, capital costs, and materials and fuels at harvesting, processing and food service levels.

If insurance and repair charges<sup>3</sup> and material, bait, and fuel expenses<sup>4</sup>, totaling about \$9.1 million (tables 3 and 4), are deducted from the total value of \$24.1 million, we will end up with a net value of \$15.0 million (line 2, table 5). This net value is considered as

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<sup>2</sup> Cost of raw material is excluded in the processing and food service sectors to avoid double accounting.

<sup>3</sup> Insurance and repair charges are paid to services rendered by another sector.

<sup>4</sup> Materials, bait, and fuels are produced by sectors other than the lobster fishery.

the real contribution exclusively from the northern lobster fishery to the Maine economy (i.e., the contribution of capital and labor employed in harvesting, processing and distributing northern lobsters). Economists call this contribution "value added" by the industry. In this case, it is a contribution from or "value added" by the harvesting, processing and food service levels of the lobster fishery.

The personal income of \$12.81 million (line 5, table 5) contributed by the fishery in 1970 was not hoarded nor has it been staying idle. It was plowed back to the Maine economy and joined the stream of cash flow of all economic activities. The income of one person or one sector in the form of wages, interest, rent or profit will be spent, one way or another, on goods or services so that it will get to persons or businesses in other sectors as their earnings. Lobstermen support food and beverage stores, clothing and shoe retailers, banks, barber shops, funeral homes and other local services by their expenditures. Once this chain reaction is touched off, it will spread out in all directions and to all sectors in the economy. Within a year's period the accumulated income generated in the economy will amount to three times the initial spending by an industry according to the results of empirical studies of the last 30 years. This is referred to in table 5 as the "multiplier effect" or income generating power from the initial spending on northern lobsters<sup>5</sup>

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The multiple of 3 was tested and proved to be valid with respect to income generated by fishery production in New England in the report prepared by the University of Rhode Island entitled, "Economic Impact of Marine-Oriented Activities--A Study of the Southern New England Marine Region," 1967. It is subject to variation in different phases of the business cycle.

It is estimated that the export of northern lobsters of \$12.81 million will generate \$25.62 million as additional income to the state of Maine for a total contribution of \$38.42 million.

The wholesale activity of northern lobsters is centered in Boston and New York. No income or value was contributed at the wholesale level in Maine. However, the lobster wholesalers from out of the State consigned shipments to local truck companies. At least \$400,000 have been earned by the local truck companies in shipping live lobsters to both wholesale centers.

Some ancillary industries, such as repair shops and bait dealers, depend on northern lobster fishing for most of their activities. In 1970, these two industries earned about \$6 million from the northern lobster fishery and, therefore, spent that much as a contribution to other sectors of the economy.

Another source of income related to the northern lobster fishery is the Federal grants of research funds. In 1970, eight projects on northern lobster development and research were in progress with a funding of \$254,000 largely spent in Maine.

The total income, derived directly and indirectly from northern lobster fishing and then generated through the chain reactions, as described above, will yield about \$54.3 million as personal income (line 12, table 5) to the Maine economy following the deduction of indirect business and corporate income taxes at all levels. After social insurance, Federal and local income taxes, approximately \$43.0 million will be netted as disposable personal income of the residents of Maine for 1970.

## II. Other Forms of Benefits

(1) Employment--Economic activities prompted by such an increase due to generated income discussed above have to be handled by additional employment. An income flow of \$54 million could support an equivalent of about 1,000 full-time jobs in other sectors in addition to the existing jobs of about 10,000 engaged by the northern lobster fishery in Maine.

### Employment Supported by Northern Lobster Fishery in Maine, 1968-1969

	<u>Number</u>
Boat owners (self-employed)	4,300 - 4,400
Fishermen (part-time)	5,300 - 5,500
Processing workers (part-time)	250 - 260
Truck drivers	30 - 35
Total	<u>9,880 - 10,195</u>

(2) State Income Tax--Personal income tax derived from this income could easily add \$1 million to the State Treasury of Maine each year based on a low rate of 2%.

(3) Tourism--Approximately 200,000 tourists visited the beach area of Maine each year during a season of 4 months, averaging about 12,500 a week or 1.4 million tourist-days each season. Assuming that each tourist spent \$12 a day<sup>6</sup>, this would result in a total spending of \$17 million. This additional income to the Maine economy derived from tourism cannot be attributed to the lobster fishery alone but also to other attractive features in the area. The income contributed by tourists directly related to the lobster fishery had already been accounted for in the analysis shown in tables 4 and 5.

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<sup>6</sup> Contacted the Branch of Environmental Economics, Economic Research Service of the Department of Agriculture over the phone.



(4) Possible Investment Expansion in Fishing Boats

A rough test of capital efficiency of lobster fishing boats is attempted. This is shown in table 6. Measured in net profit terms, a return of 10.4 percent has been earned by the investment in fishing boats in 1967. This indicates that capital investment in northern lobster fishing yielded a net return 2.3 times greater than earnings from deposits in banks at the then current 4.5% interest.

This test suggests that should the same situation prevail today, (1) the northern lobster fishing boats will at least continue to stay in business instead of withdrawing, and (2) there is a possibility of induced investment diverted either to improve the existing capital (boats and equipment) or to attract new entries to the fishery, assuming that no problems will be forthcoming with respect to lobster resources in the region.

Table 1.--Number of Northern lobster fishermen and landings in Maine,  
1960-1970

Year	Number of fishermen	Landings in 1000 pounds
1960	6,670	24,014
1961	6,480	20,918
1962	5,890	22,075
1963	5,740	22,804
1964	5,680	21,413
1965	5,210	18,862
1966	5,340	19,916
1967	5,431	16,489
1968	5,527	20,600
1969	5,814	20,230 <sup>1/</sup>
1970	NA	19,450 <sup>1/</sup>

<sup>1/</sup> Extrapolated from the average ratio of Maine landings to total U.S. landings in 1966-1968.

Source: Figures for 1960-1968 are from Fishery Statistics of the U.S., and those for 1969-1970 from Shellfish Situation and Outlook Report, 1970, National Marine Fisheries Service, U.S. Department of Commerce.

Table 2.--Seafood Processing in Maine, 1963 and 1967

	Canned and Cured		Fresh and Frozen Packaged	
	1963	1967	1963	1967
Number of establishments	40	29	none reported	12
Employees (1000)	1.4	1.3	--	.7
Payroll (\$ million)	4.2	4.6	--	2.9
Production workers (1000)	1.3	1.2	--	.7
Wages (\$ million)	3.5	3.7	--	2.5
Value added (\$ million)	10.0	9.2	--	3.9
Value of production (\$ million)	21.8	20.2	--	9.3
Capital expenditure (\$ million)	0.6	0.3	--	0.3

Source: Census of Manufactures, Bureau of the Census, 1963 and 1967.

Table 3.--Quantity and "value added" of processed Northern lobster products, Maine, 1968

Products	Amount in pounds		Value (Dollars)	Value added (Dollars)
	(Live wt.)	(Product Wt.)		
Lobster meat	807,200	179,376	842,480	353,810
Frozen whole	30,328	30,328	45,500	19,110
Canned	<u>145,350</u>	<u>32,300</u>	<u>151,600</u>	<u>69,736</u>
	982,878 <u>1/</u>	242,004	1,039,580	442,656

1/ Only 4.3% of total landings.

Note: (1) The production of these three products involved 256 employees.

(2) No processing of imported lobster is involved here, since Maine is the production center and not the marketing center of lobsters. Imports go directly to Boston and New York, the two wholesale centers of Northern lobsters.

Source: Joint Master Plan for the Northern Lobster Fishery, Bureau of Commercial Fisheries, U.S. Department of the Interior, April 1970.

Table 4.--Adjusted landings, exports, tourist consumption of Northern lobster in Maine and "value added" at harvesting and restaurant levels, 1970

	Quantity	Value
	1000 lbs. (rd. wt.)	\$1000
1. Landings, adjusted (see text p. 1)	22,882	22,424
2. Consumption by Maine residents <sup>1/</sup>	2,475	2,426
3. Export to other States (including tourist consumption)	<u>20,407 @ 98¢/lb.</u> <sup>2/</sup>	<u>\$19,999</u>
4. Deduct materials, fuels, bait and repair		<u>8,240</u>
5. Value added of net export at the harvesting level <sup>3/</sup>		<u><u>11,759</u></u>
6. Total restaurant sales of Northern lobsters to tourists <sup>4/</sup>		5,275
7. Deduct cost of raw material (10% of landings) <sup>5/</sup>		<u>2,242</u>
8. Gross profit to Northern lobster restaurants		3,033
9. Deduct materials, fuels, and insurance		<u>211</u>
10. Value added by Northern lobster restaurants		<u><u>2,822</u></u>

<sup>1/</sup> "A Survey of Fish Purchases by Socio-Economic Characteristics," unpublished Manuscripts, April 1970; and "Basic Economic Indicators--Northern Lobsters," unpublished Manuscript, Division of Economic Research, National Marine Fisheries Service, NOAA, U.S. Department of Commerce, 1970.

<sup>2/</sup> Average ex vessel price of 1970.

<sup>3/</sup> Fuel is the item imported. After deducting its import value, the result is equivalent to the value of net export.

<sup>4/</sup> Extrapolated from the cost of raw material by using the markup rate calculated from the financial statements of restaurants published in The Business Income Tax Returns Statistics, 1967, Internal Revenue Service.

<sup>5/</sup> 25% of Maine Northern lobster landings was consumed by tourists, of which 15% was bought at the dockside and the remaining 10% from restaurants.

Table 5.--Regional income generated in Maine from northern lobster fishery and ancillary industries, 1970

	(\$1000)
Northern lobster fishery:	
1. Value added of net exports	
a. Harvesting level (line 5, table 4)	11,759
b. Processing level (table 3)	443
c. Food service level (line 10, table 4)	2,822
d. Transportation--truck companies service (see text)	<u>400</u>
2. Gross regional product <sup>1/</sup>	15,424
Less: capital consumption allowance @ 8.5%	<u>1,311</u>
3. Net regional product	14,113
Less: indirect business tax to non-local government @ 5% of GRP	<u>771</u>
4. Net regional income	13,342
Less: adjustment for corporate income tax liability, undistributed corporate profit and employment taxes @ 4%	<u>534</u>
5. Personal income (including retained profits) directly from lobster fishery	12,808
6. Generated income with multiplier effect @ 3.0 <sup>2/</sup>	<u>25,616</u>
7. Total income contributed by northern lobster fishery	<u>38,424</u>
Ancillary industries:	
8. Bait dealers' earnings <sup>3/</sup> -- \$2,100,000	
9. Repair shops' earnings <sup>3/</sup> -- 4,980,000/6,080,000 After deduction of all taxes at different levels = \$5,046,000 with multiplier effect @ 3.0	15,138
10. Benefit from government lobster fishery projects (amount of money spent for 8 projects in 1970) <sup>4/</sup> \$254,000 with multiplier effect @ 3.0	762 /
11. Income contributed by ancillary industries	<u>15,900</u>
12. Total: northern lobster and ancillary industries	<u>54,324</u>

<sup>1/</sup> Fuel is an imported item. After deducting it from the costs to get the value added, the total value here is equivalent to GRP created by the net export of northern lobsters.

<sup>2/</sup> See explanation in the text.

<sup>3/</sup> "Estimation of the Economic Benefits to Fishermen, Vessels and Society from Limited Entry to the Inshore U.S. Northern Lobster Fishery," unpublished Manuscript, Division of Economic Research, National Marine Fisheries Service, NOAA, U.S. Department of Commerce, March 1970.

<sup>4/</sup> Joint Master Plan for the Northern Lobster Fishery, National Marine Fisheries Service, NOAA, U.S. Department of Commerce, April 1970, p. VIII-17 to 22.

Table 6.--Investment and earnings of northern lobster boats and vessels  
in Maine, 1967

	Inshore boats	Offshore boats	Total
1. Number	4,310	30	4,340
2. Average present worth/boat (\$)	5,600	36,900	---
3. Total investment at 1967 value	24,136,000	1,107,000	25,343,000
4. Net return/boat, 1967	582	4,132	---
5. Total net return (line 4 x line 1)	2,508,420	123,960	2,632,380
6. Rate of return to investment (line 5 ÷ line 3 x 100)	10.3%	11.2%	10.4%

Source: "Basic Economic Indicators--Northern Lobsters," unpublished Manuscript, Division of Economic Research, National Marine Fisheries Service, NOAA U.S. Department of Commerce, April 1970.

