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ECONOMIC ANALYSIS OF COST AND RETURNS IN THE SPINY LOBSTER FISHERY BY BOAT AND VESSEL SIZE

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and
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A Marine Advisory Bulletin
in cooperation with the
Food and Resource Economics Department
University of Florida

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INTRODUCTION

An economic survey of 25 Florida Keys lobster boat and vessel captains was conducted during the Fall of 1974 to obtain cost, production and returns data for the 1973-74 season. The captains interviewed in the study represent a statistical sample of boat and vessel size classes within geographic fishing areas to insure accurate industry representation. Only captains based in Florida Keys ports and fishing in Gulf and Atlantic waters adjacent to the Florida Keys were included in the survey. The Bahamian and Caribbean fisheries are excluded.

The purposes of this study were to (1) provide individual fishing firms a base with which they can compare their own operations to determine if any change in their fishing practices is warranted, (2) provide economic information on sales and purchases which may be used as an indication of the economic contribution made by the lobster fishery to the area economy, and (3) provide an economic basis for determining the economic consequences of alternative management programs which might be considered by the industry and regulatory agencies. To accomplish these objectives, production practices

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and cost and returns are analyzed on an industry average basis and by four boat and vessel size classes.[1/] This bulletin reports on information pertaining to the first objective of the overall study.

INDUSTRY AVERAGE COST AND RETURNS

Landings of lobsters during the 1973-74 season averaged 12,828 pounds per boat (Table 1). Dockside value of the lobsters landed was $13,848 which accounted for over 50 percent of the total value of landings by lobster boats. The minimum and maximum columns in Table 1 indicated the wide variation between boats in landings of species and in total landings.

Average industry costs of lobster fishing are classified as variable costs and fixed costs. Variable costs are incurred while actually fishing and represent approximately 57 percent of total costs. Traps lost and crew wages are of almost equal importance and are the largest components of variable costs at about $1,500 each (Table 1). These costs, like all individual cost items, vary significantly within the industry. This variation is indicated by minimum and maximum costs reported in Table 1. The zero entry for crew wages represents boats operated by the captain without hired crewmen aboard.

Fuel and oil together cost over $800 per year which accounts for approximately 16 percent of variable costs. These costs vary significantly in the industry because of variations in size of engine and boat as well as frequency of use. These variations are considered in greater detail in the

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[1/] Continuous production and cost functions are currently being estimated and will be presented in a later publication. For a review of the growth and importance of the industry see Florida Sea Grant Research Report Number 12.

[2/] The definitional distinction between boats (less the 5-tons net carrying capacity) and vessels (5-tons or greater capacity) is not adhered to in this bulletin and both are usually simply referred to as lobster boats.

Table 1. Cost and returns analysis for Florida Keys lobster boats and vessels[a]

Item	Average	Range[b] Minimum[c]	Range[b] Maximum
RETURNS:			
Lobster:			
Pounds	12,828	2,963	35,308
Dollars	13,848	3,176	37,780
Crab ($)	3,378	0	42,581
Other ($)	4,731	0	92,000
Total ($)	21,952	3,176	110,440
COSTS (LOBSTER FISHING):	----------Dollars----------		
Variable Costs:			
Fuel	596	96	1,092
Oil and Oil Change	207	37	364
Groceries	161	19	455
Bait	287	0	1,920
Brush	15	2	31
Gloves	78	8	165
Transportation	22	0	133
Puller Operating Cost	14	0	116
Rain Gear	45	30	75
Traps Lost	1,534	88	4,398
Crew Wages	1,528	0	6,430
Repairs[d]:			
Hull	246	0	1,200
Engine	360	0	1,73
Gear	35	0	16
Total	641	0	2,42
TOTAL VARIABLE COSTS	5,129	411	16,50
Fixed Costs:			
Depreciation[c]:			
Trap	1,846	268	5,13
Hull	787	40	2,27
Engine	645	128	1,60
Gear	276	0	83
Total	3,554	558	9,5
License	79	62	12
Interest on Loans	193	0	85
Insurance	59	0	35
TOTAL FIXED COSTS	3,886	620	9,37
TOAL ALL COSTS	9,015	1,031	25,87
NET RETURN TO LOBSTER FISHING[d]:			
Above Total Variable Costs	8,719	1,464	21,27
Above Total Costs	4,833	-770	13,15

[a] A stratified sample of twenty-five fishing craft were included in these analyses.

[b] Totals for the minimum and maximum reported values or costs do not add because individual entries represent different firms.

[c] Repair and depreciation on hull, engine and gear (other than trap) were prorated according to percent of income earned from lobster fishing. Interest and insurance was prorated in the same manner.

[d] Net returns include cost and returns for lobster fishing only.

following sections.

Repair costs for hull, engine and gear represent a major variable cost item with engine repairs being most expensive. Individual firm costs for repairs vary from 0 to $2,424 depending on fishing time and on age, type and size of engines and boats. Note that repair costs reported in Table 1 are prorated on the basis of use of the hull, engine and gear for lobster fishing. The prorated share of total repairs is based on the proportion of lobster income from commercial fishing.[3/]

Depreciation is the largest component of total costs of lobster fishing and accounts for essentially all of the fixed costs (costs which do not vary with fishing effort). Depreciation costs for hull, engine and gear were prorated on the same basis as were repair costs. However, trap depreciation costs were totally charged to lobster fishing since they are used exclusively for this purpose. The trap depreciation period covered a three-year expected life which was assumed based on a consensus of lobster boat captains interviewed. Value of traps lost was reported as a variable cost and was based on the reported number of traps lost by each firm interviewed and the remaining value of each trap after depreciation had been taken into account.

Other fixed costs include license, interest on loans and insurance. Average insurance costs were only $59 (Table 1) because approximately two-thirds of the firms interviewed were not covered by insurance.

The average total cost of lobster fishing was $9,015. Considering only returns from lobster catches, this left the average firm $8,719 above

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[3/] Repair costs for craft and gear used to fish for several species cannot be precisely allocated to any one species. Another method of prorating would have been fishing time or effort allocated to each species. However, this information was not available for all species and this method also has obvious shortcomings.

variable costs and $4,833 above total costs. These returns--from lobster fishing alone--occur to the captain-owner of the boat for his labor, management and investments.

ANALYSIS OF COST AND RETURNS BY BOAT AND VESSEL SIZE

The minimum and maximum individual cost and returns items reported in Table 1 suggest wide variation within the industry. To further analyze the production practices within the industry, firms were divided by size (length) into four groups of lobster boats. The four length sizes were 16-22 feet, 24-28 feet, 31-36 feet and 40-55 feet. For each size class a detailed cost and returns budget was developed and is presented in Appendix Tables A-D. Comparisons of major items are given in the remainder of this bulletin.

Total returns by size of boat or vessel

Total value of landings increases with size of boat from $8,622 for the smallest boats to $40,850 for the largest boats (Table 2). The 31-36 foot class of boats lands the greatest absolute amount of both lobsters and stone crabs. On a percentage basis, the lobster share of total value of landings decreases as the boat size increases beyond the 24-28 foot class because of increases in stone crab and fish catches. Approximately 58 percent of the total value of landings on the 40-55 foot boats is accounted for by fish landings, primarily king mackerel.

Net returns to lobster fishing

Total variable costs of lobster fishing increase with boat size (Table 3). Net returns above those variable costs (total lobster revenues minus variable costs of lobster fishing) are positive for all boat size classes, ranging from $4,940 for 16-22 foot boats to $11,811 for the 31-36 foot boats. Fixed costs also vary directly with boat size, ranging from $1,906 for the smallest boats to $5,809 for the largest boats.

Table 2.--Total value of landings for lobsters, stone crabs and fish landed by specified lobster boat sized classes, Florida Keys, 1973-74

	16-22 feet		24-28 feet		31-36 feet		40-55 feet	
Item	$	%	$	%	$	%	$	%
Lobster	6,778	79	13,563	94	19,374	60	17,047	42
Crab	1,479	17	562	4	9,940	31	118	0
Fish	365	4	272	2	2,727	9	23,685	58
TOTAL	8,622	100	14,397	100	32,041	100	40,850	100

Net returns to the captain and owner, after both fixed and variable costs have been accounted for,were greatest for the two middle size boat groups. Boats ranging in size from 31-36 feet returned their captain-owners an average of $6,826 for the season while those in the 24-28 foot class averaged $5,976. The largest boats returned the captain-owner a smaller net return to lobster fishing than any other size class. Reasons for these differences in net returns will be more fully considered in the final sections of this bulletin.

Net returns to the captain-owner originate from several sources. They represent payment for (1) labor and management furnished by the captain-owner of the firm, (2) risk-taking and (3) the return on investment he could receive from other uses of his funds. Although it is not possible to precisely allocate total net returns to these individual functions, a reasonable attempt was made in Table 3.

Captains' salaries ranged from $3,890 on the smallest boats to $6,217 for 31-36 foot boats (Table 3). Estimates of captains' salaries were based on the number of work hours associated with lobster fishing reported by each captain interviewed. An hourly wage rate of $7.00 was used to determine salary. This wage rate is the average of the rate received by hired crewmen employed on boats interviewed. Thus, imputed captain's

Table 3.--Net returns to spiny lobster fishing by boat and vessel size, Florida Keys, 1973-74 [a]

Item	Boat and vessel size (feet)			
	16-22	24-28	31-36	40-55
	dollars			
Lobster returns	6,778	13,563	19,374	17,047
Total variable cost	1,838	3,920	7,563	8,744
Returns above variable cost	4,940	9,643	11,811	8,330
Fixed costs	1,906	3,668	4,985	5,809
Total costs	3,743	7,587	12,548	14,553
Returns above total cost	3,035	5,976	6,826	2,494
Captain's salary[b]	3,890	5,603	6,217	4,571
Returns to investment[c]	310	1,153	1,694	3,779
Residual to ownership[d]	-1,165	-780	-1,085	-5,856

[a]Analysis based on Appendix Tables A-D.

[b]Captains' salaries are imputed as the product of the number of hours worked and $7.00 per hour (average earnings per hour of hired crewmen on vessels surveyed).

[c]Returns to investment were computed at an assumed rate of 8 percent.

[d]Residual to ownership is the returns above the total costs minus the captain's salary and returns to investment.

salary represents the income the captain could earn if he hired out on another lobster boat. This opportunity return probably underestimates the return for the captain's time since the captain usually has more responsibility than hired crewmen. Differences in earnings represent different numbers of hours worked since all work was valued at $7.00.

Returns to investment estimated in Table 3 represent what the owner could expect to receive for his investments if their value were invested at 8 percent in an alternative use such as the financial market. Value of investments was estimated to be the present value of lobster traps plus a prorated share of the present value of the remaining gear, equipment and craft.

Again, the percent of total fishing income resulting from lobster catches was used as the basis for prorating. As might be expected, the returns for investments increased with size of boats. The range was from $310 for small boats to $3,779 for the largest boats.

The sum of the imputed returns to the captain (salary) and returns to investment for the average boat in Table 3 is greater than net returns (total returns minus total cost) for each boat size class. Thus the residual left to pay a return for other management functions is negative for all size classes. The implications are that the captain-owner would be "better off" financially if he invested his capital in alternative uses and hired out as a crewman on another lobster boat rather than operating his own firm for lobster fishing. However, this implication must be qualified. First, this allocation scheme assumes the captain has the labor and investment alternatives that were suggested. Obviously, all lobster fishermen cannot work for someone else. Second, the analysis does not consider the nonmonetary returns the captain-owner receives from being an independent lobster fishermen such as freedom, excitement, and other altruistic values, for example, love of the sea. Third, the analysis does not include the net returns the captain-owner receives from fishing for other species of fish and shellfish.

This third consideration (returns from other species) deserves additional consideration. If the captain had the alternative of fishing for the other species <u>during</u> the lobster season then one of two conclusions is possible--(1) fishing for the other species is less profitable and therefore lobstering is chosen or (2) fishing for other species is more profitable than fishing for lobsters but the captain chooses to fish for lobster because of nonmonetary rewards. In the first case, the implication that the captain would be "better off" monetarily with alternative investments and labor alternatives

is probably correct--at least during lobster season since the residual to ownership during this period is negative (Table 3). If the second case is relevant, then the present pattern of ownership and employment may be quite profitable but not measurable. A second line of reasoning which may explain the present pattern of investments and firm structure considers fishing activities during other periods of the year. If it is profitable to fish for other species outside of the lobster season, but not profitable during the lobster season, firms may be recovering fixed costs during the lobster season. The average firm for each boat size class more than covers variable costs during lobster season (Table 3) and thus lowers the fixed cost for the year which would otherwise be attributed to the other fishing enterprises, thus, total net annual profits may be greater due to fishing for lobsters.

A case where reducing fixed costs is important is for kingfish vessels which operate in the lobster fishery during the kingfish off season. These vessels often are in excess of 40 feet in length and the primary reason for investing in these vessels for the kingfish fishery. This analysis shows that it is profitable for these vessels to enter the lobster fishery since variable expenses are more than covered thus reducing the yearly fixed expenses and adding to annual profits. This analysis does not address the question--"which is the most profitable size vessel to invest in for fishermen whose primary interest is in non-lobster fisheries?" However, this analysis is useful to these fishermen in determining how to use their fixed investments in the off season. Given that it is profitable through the reduction of fixed expenses to enter the lobster fishery during the kingfish off season, the fishermen interested strictly in monetary profits should next consider his expected

earnings from fishing for other species during this season. For example, is grouper fishing during the off season for kingfish more profitable than the alternative of lobster fishing shown in this report?

Comparison of Major Cost Items

Differences in profitability between boat size class is a function of cost and catch associated with each boat class. Price per pound is essentially equal for all fishermen and thus does not explain differences in net returns or profitability. Table 4 presents costs per pound of lobster landed classified by major cost categories.

Total variable costs per pound increase with size of boat used to land lobsters, ranging from $.30 for the smallest boats to $.54 for the largest boats (Table 4). Total fixed costs per pound decrease with boat size from $.31 for the smallest boats to $.28 for the 31-36 foot class but then increases to $.37 for the largest boats. Together, fixed and variable cost total to $.61 per pound for the smallest boats to $.91 per pound for the largest boats. Considering only costs, the two smallest boat size classes are the most efficient (minimum cost). To further explain the cost differences, costs are presented and discussed by major individual cost items.

Fuel and oil cost per pound is higher for the small 16-22 foot boats than the larger boats which range from $.02 to $.06 per pound (Table 4). The relatively large cost per pound ($.11) for fuel and oil for the small boats is because of the predominance of gasoline outboard engines on these boats compared to diesel on the larger boats. This cost advantage for small boats is partly offset by engine maintenance (repairs) costs incurred on larger boats (Appendix Tables A-D). However, note that the repair cost for the largest boats are less than for the 31-36 foot class. This is because the majority of the engines for the largest size class were still under warranty compared to the other size classes. Total repair costs range from

Table 4.--Spiny lobster costs per pound by boat and vessel size[a], Florida Keys fishery, 1973-74

Item	Boat or vessel size (feet)			
	16-22	24-28	31-36	40-55
	dollars/pound			
Total variable costs	.30	.32	.41	.54
Total fixed costs	.31	.30	.28	.37
Total costs	.61	.62	.69	.91
	dollars			
Specific cost items:				
Fuel and oil				
Total	674	682	935	1,010
Per pound	.11	.02	.05	.06
Bait				
Total	143	215	545	213
Per pound	.02	.02	.03	.01
Traps lost				
Total	655	1,290	2,121	2,474
Per pound	.11	.11	.12	.16
Crew wages				
Total	0	1,024	2,186	3,933
Per pound	.00	.08	.12	.25
Repairs				
Total	153	361	1,355	740
Per pound	.02	.03	.07	.05
Depreciation				
Total	613	3,114	4,660	5,434
Per pound	.10	.26	.26	.34

[a]Computed from Appendix Table A-D.

$.02 for the small boats to $.07 per pound for the 31-36 foot vessels.

Crew wages increase with boat and vessel size. This reflects an increase in the average number of crewmen per boat as size increases. Crew

costs of $.25 per pound is the largest individual variable cost item for the 40-55 foot vessel size class. Additional crewmen are required on larger craft simply to go to sea while smaller boats only require additional crewmen during peak landing periods, if at all.

Depreciation costs per pound represent the largest single cost item for all boats and vessels (with the exception of fuel on the small boats). Depreciation costs of $.34 per pound account for over 30 percent of all costs for larger boats.

Production characteristics by boat and vessel size

Differences in costs per pound reviewed in the previous section are influenced by variations in production practices of individual firms. Comparisons of major production characteristics are presented in Table 5.

Number of traps fished increases with boat size from 341 for small boats to 842 for the 31-36 foot boats and then decreases to 809 traps for 40-55 foot boats.[4/] The increase in number of traps as boat size increases is consistent with increases in depreciation costs (Table 4 and Appendix Table A-D) and total lobster landings by vessels or boats (Table 2). Number of traps lost obviously increases with the number of traps fished but number of traps lost is more directly related to the size of boat. The percent of traps lost increases from 20 percent for the smallest boats to 46 percent for the largest boats (Table 5). This relationship between percentage of traps lost and boat size exists because smaller boats tend to fish the more protected bay areas relative to larger boats which fish further offshore in deeper, rougher water. Traps fished per day increase

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[4/] Traps fished were estimated as the weighted average number of traps each firm fished in order to take into account the beginning number of traps, days fished by each trap and traps lost.

with boat size because of the greater speed of larger craft, the tendency towards having more hired crewmen aboard as the size increases and the ability to stay out longer.

Pulls per season represent the number of times each trap was pulled during the season to remove the catch. Total number of pulls per season is essentially the same for all boat and vessel sizes. However, weeks fished during the season does vary by boat size from 36 weeks for the 24-28 foot class to 25 weeks for the 40-55 foot class (Table 5). This results in a shorter set period for traps fished by larger boats. The largest boats pull all of their traps at least once a week while the smaller boats pull between 75 to 85 percent of their traps each week. Frequency of pulls is closely associated with hours fished per day and the carrying capacity of boats. Capacity is also related to the number of traps fished per day.

Number of traps and hours fished, trips, pulls per season and weeks fished all obviously affect landings. But since each of these factors is related, it is hard to determine their effect on landings. Direct casual relations of each individual item to landings is only approximate. Landings per trap per season range from 18 pounds for the smallest boats to 22 pounds for 24-28 and 31-36 foot boats. The two pounds per trap difference between the largest and the smallest boats is, in part, due to the shorter season for larger boats. However, most of the catch is made during the more productive first four months of the season. The relatively low 18 pounds pertrap for smaller boats is probably closely associated with types of fishing grounds available to the smaller boats. The size of catch per week and per trip is associated with number of traps

Table 5.--Comparison of spiny lobster production practices by boat and vessel size classes, Florida Keys, 1973-74 season[a]

Item	Unit	Boat and vessel size (feet)			
		16-22	24-28	31-36	40-55
Traps fished	no.	341	561	842	809
Traps lost:					
Number	no.	98	193	318	371
Percent	%	29	34	38	46
Traps fished per day	no.	139	190	202	272
Hours fished per day	hrs.	7	8	8	9
Pulls per season	no.	27	27	25	27
Weeks fished	wks.	35	36	33	25
Trips per season	no.	66	103	89	48
Boat and vessel size:					
Length	ft.	20	26	34	46
Width	ft.	7	9	12	15
Volume of lobsters:					
Per trap	lbs.	18	22	22	20
Per week	lbs.	175	339	549	636
Per trip	lbs.	93	118	204	331

[a]Data reflect averages for boat and vessel size classes.

fished, the intensity of fishing effort during the period (pulls, etc.) and the part of the season fished.

Appendix Table A.--Cost and returns analysis for Florida Keys lobster boats and vessels 16-22 in length[a]

Item	Average	Range[b] Minimum[c]	Range[b] Maximum
RETURNS:			
Lobster:			
Pounds	6,142	2,963	14,000
Dollars	6,778	3,176	14,980
Crab ($)	1,479	0	6,836
Other ($)	365	0	1,259
Total ($)	8,622	3,176	17,090
COSTS (LOBSTER FISHING):	---------- Dollars ----------		
Variable Costs:			
Fuel	477	96	832
Oil and Oil Change	197	37	326
Groceries	71	19	119
Bait	143	0 (1)	500
Brush	11	2	27
Gloves	59	8	144
Transportation	40	0 (3)	133
Puller Operating Cost	1	0 (6)	10
Rain Gear	30	30	30
Traps Lost	655	88	2,199
Crew Wages	0	0 (7)	0
Repairs[d]:			
Hull	26	0 (3)	50
Engine	107	13	330
Gear	20	0 (6)	140
Total	153	13	353
TOTAL VARIABLE COSTS	1,838	411	3,886
Fixed Costs:			
Depreciation[d]:			
Trap	1,103	268	2,943
Hull	181	40	495
Engine	462	128	1,600
Gear	70	0 (4)	281
Total	613	558	3,642
License	77	62	123
Interest on Loans	5	0 (6)	34
Insurance	7	0 (6)	51
TOTAL FIXED COSTS	1,906	620	3,765
TOTAL ALL COSTS	3,743	1,031	5,836
NET RETURN TO LOBSTER FISHING[e]:			
Above Total Variable Costs	4,940	1,464	13,200
Above Total Costs	3,034	-770	9,435

[a]Seven fishing craft 16-22 feet in length were included in the sample.

[b]Totals for the minimum and maximum reported values or costs do not add because individual entries represent different firms.

[c]Number in parenthesis represents number of firms with zero expenses or returns for specific items.

[d]Repair and depreciation on hull, engine and gear (other than trap) were prorated according to percent of income earned from lobster fishing. Interest and insurance was prorated in the same manner.

[e]Net returns include cost and returns for lobster fishing only.

Appendix Table B.--Cost and returns analysis for Florida Keys lobster boats and vessels 24-28 feet in length[a]

Item	Average	Range[b] Minimum[c]	Range[b] Maximum
RETURNS:			
Lobster:			
Pounds	12,203	6,171	22,000
Dollars	13,563	7,171	23,540
Crab ($)	562	0	1,700
Other ($)	272	0	960
Total ($)	14,397	7,691	25,240
COSTS (LOBSTER FISHING):	---------- Dollars ----------		
Variable Costs:			
Fuel	472	320	768
Oil and Oil Change	210	120	279
Groceries	167	40	336
Bait	215	20	500
Brush	17	7	24
Gloves	87	37	126
Transportation	14	0 (5)	100
Puller Operating Cost	19	0 (1)	80
Rain Gear	43	30	60
Traps Lost	1,290	381	2,199
Crew Wages	1,024	0 (4)	4,708
Repairs[d]:			
Hull	233	0 (1)	896
Engine	106	0 (4)	479
Gear	22	0 (5)	104
Total	361	0 (1)	896
TOTAL VARIABLE COSTS	3,920	1,610	7,034
Fixed Costs:			
Depreciation[d]:			
Trap	1,701	807	2,936
Hull	698	350	1,281
Engine	496	190	917
Gear	219	45	458
Total	3,114	2,765	4,142
License	78	62	107
Interest on Loans	363	0 (3)	850
Insurance	114	0 (4)	350
TOTAL FIXED COSTS	3,668	2,912	5,340
TOTAL ALL COSTS	7,587	4,522	10,389
NET RETURN TO LOBSTER FISHING[e]:			
Above Total Variable Costs	9,644	2,242	16,659
Above Total Costs	5,975	-732	13,151

[a]Seven fishing craft between 24 and 28 feet in length were included in the sample.

[b]Totals for the minimum and maximum reported values or costs do not add because individual entries represent different firms.

[c]Number in parenthesis represents number of firms with zero expenses or returns for specific items.

[d]Repair and depreciation on hull, engine and gear (other than trap) were prorated according to percent of income earned from lobster fishing. Interest and insurance was prorated in the same manner.

[e]Net returns include cost and returns for lobster fishing only.

Appendix Table C.--Cost and returns analysis for lobster boats and vessels from 31 to 36 feet in length[a]

Item	Average	Range[b] Minimum[c]	Range[b] Maximum
RETURNS:			
Lobster:			
Pounds	18,112	8,500	35,308
Dollars	19,374	9,095	37,780
Crab ($)	9,940	0 (5)	42,581
Other ($)	2,727	0 (3)	8,075
Total	32,041	10,174	82,221
COSTS (LOBSTER FISHING):		Dollars	
Variable Costs:			
Fuel	716	400	1,092
Oil and Oil Change	219	150	364
Groceries	213	102	455
Bait	545	0 (1)	1,920
Brush	17	10	31
Gloves	90	53	165
Transportation	24	0 (5)	116
Puller Operating Costs	25	10	116
Rain Gear	54	30	75
Traps Lost	2,121	733	4,398
Crew Wages	2,186	0 (2)	6,430
Repairs:			
Hull	539	0 (1)	1,200
Engine	765	0 (1)	1,731
Gear	51	0 (1)	166
Total	1,355	0	2,424
TOTAL VARIABLE COSTS	7,563	3,103	16,502
Fixed Costs:			
Depreciation[d]:			
Trap	2,556	1,285	5,138
Hull	968	500	1,654
Engine	705	298	1,072
Gear	431	22	833
Total	4,660	2,105	8,697
License	82	82	82
Interest on Loans	204	0 (4)	500
Insurance	39	0 (6)	276
TOTAL FIXED COSTS	4,985	3,350	9,371
TOTAL ALL COSTS	12,548	7,921	25,873
NET RETURN TO LOBSTER FISHING[e]:			
Above Total Variable Costs	11,811	4,535	21,278
Above Total Costs	6,827	1,140	11,907

[a]Seven fishing craft from 31 to 36 feet in length were included in the sample.

[b]Totals for the minimum and maximum reported values or costs do not add because individual entries represent different firms.

[c]Number in parenthesis represents number of firms with zero expenses or returns for specific items.

[d]Repair and depreciation on hull, engine and gear (other than trap) were prorated according to percent of income earned from lobster fishing. Interest and insurance was prorated in the same manner.

[e]Net returns include cost and returns for lobster fishing only.

Appendix Table D.--Cost and returns analysis for lobster boats and vessels 40-55 feet in length[a]

Item	Average	Range[b] Minimum[c]	Range[b] Maximum
RETURNS:			
Lobster:			
Pounds	15,903	13,979	16,724
Dollars	17,047	14,800	17,966
Crab ($)	118	0 (3)	472
Other ($)	23,685	0 (2)	92,000
Total ($)	40,850	16,950	110,440
COSTS (LOBSTER FISHING):			
Variable Costs:			
Fuel	812	700	999
Oil and Oil Change	198	178	221
Groceries	216	176	250
Bait	213	0 (3)	318
Brush	14	10	19
Gloves	75	54	101
Puller Operating Costs	10	10	10
Rain Gear	60	60	60
Traps Lost	2,474	1,466	4,398
Crew Wages	3,933	1,715	5,840
Repairs:[d]			
Hull	144	0 (1)	250
Engine	538	59	1,645
Gear	58	0 (1)	100
Total	740	299	1,645
TOTAL VARIABLE COSTS	8,744	4,896	11,367
Fixed Costs:			
Depreciation:[d]			
Trap	2,156	734	4,404
Hull	1,686	342	2,270
Engine	1,123	529	1,354
Gear	469	175	677
Total	5,434	1,780	8,705
License	82	82	82
Interest on Loans	206	0 (2)	699
Insurance	87	0 (3)	349
TOTAL FIXED COSTS	5,809	4,491	6,886
TOTAL ALL COSTS	14,553	10,552	17,572
NET RETURN TO LOBSTER FISHING:[e]			
Above Total Variable Costs	8,303	6,153	13,070
Above Total Costs	2,493	-52	7,414

[a]Four fishing craft 40-55 feet in length were included in the sample.

[b]Totals for the minimum and maximum reported values or costs do not add because individual entries represent different firms.

[c]Number in parenthesis represents number of firms with zero expenses or returns for specific items.

[d]Repair and depreciation on hull, engine and gear (other than trap) were prorated according to percent of income earned from lobster fishing. Interest and insurance was prorated in the same manner.

[e]Net returns include cost and returns for lobster fishing only.