

AN ECONOMIC AND FINANCIAL STUDY OF THE FLUKE OTTER-TRAWL FISHERY OF NEW JERSEY

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ABSTRACT

A large part of the New Jersey summer flounder or fluke fishery is found in the southern part of the State. The inshore fleet is composed of older, small boats (less than 40-foot length) and newer medium-sized vessels (40- to 49-foot length). Nearly all of the medium craft were built in the postwar period and represent the more efficient segment of the inshore fleet.

Offshore vessels range from 55 to over 100 feet in length. Gross receipts, net profit, and return on investment indicate that the offshore fishery is the most profitable despite the large initial investment required.

BACKGROUND

Otter trawlers known as "draggers" were not successfully operated from New Jersey ports until some time after World War I; as late as 1921 their number did not exceed a dozen. However, the proven efficiency of the otter trawl forced the eventual replacement of older types of gear such as hand lines and pound nets. More recent developments in the size and composition of the New Jersey dragger fleet are indicated in table 1.

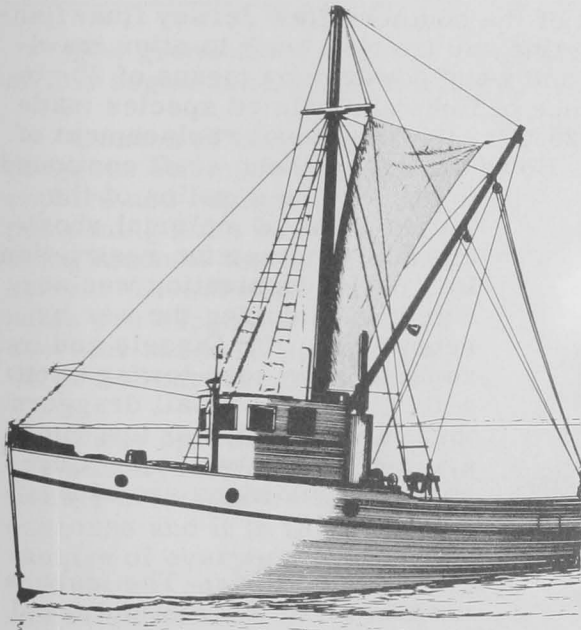


Fig. 1 - Small New Jersey fluke otter trawler or dragger (less than 40 feet, length over-all).

The total ex-vessel value of the catch landed by the otter-trawl fleet during 1957 in New Jersey was \$1.8 million. Flounders, nearly all fluke, accounted for about 46 percent of the total catch value; scup, 17 percent; sea bass, 8 percent; and northern lobster, 9 percent. The remainder was composed of some 40 other commercial species.

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Table 1 - Two-Year Comparison of New Jersey Otter-Trawl Fleet

Item	1955 1957	
	(Number)	
Motor vessels (5 net tons and over)	164	158
Motor boats (less than 5 net tons)	62	24
<u>Otter trawlers by Counties:</u>		
Atlantic	40	28
Cape May	114	85
Monmouth	32	34
Ocean	40	35
Total	226	182

The importance of the fluke fishery to the New Jersey otter-trawl fleet is summarized in table 2.

Table 2 - New Jersey Otter-Trawl Fleet Landings of Leading Commercial Species, 1957

Species	Quantity	Ex-vessel Value
	1,000 Lbs.	\$1,000
Fluke and mixed flounders	5,120	842
Scup (porgy)	6,461	320
Sea bass	1,399	160
Northern lobster	546	172
Other	8,202	349
Total	21,728	1,843

The three leading counties produced all of the fluke catch landed by New Jersey otter trawlers. Most of the fluke was caught by otter trawlers, but a small quantity was caught by other gear.

Cape May County was dominant in the New Jersey flounder fishery during 1957. Its 85 otter trawlers were the largest single fleet of a total of 182 vessels and boats in the State. Of the total New Jersey flounder catch, the Cape May County fleet accounted for 44 percent of the quantity and 42 percent of the value. That is the reason for selecting Cape May County as typical of the New Jersey summer flounder or fluke fishery.

County	Quantity	Ex-vessel Value
	<u>1,000 Lbs.</u>	<u>\$1,000</u>
Atlantic	1,769	284
Cape May	2,268	358
Ocean	1,115	202
Total	5,143	844

^{1/} Mostly caught by otter trawlers, but includes a small amount caught by other types of gear.

INSHORE FLUKE OTTER TRAWLERS

SMALL BOAT FLEET: The development of the southern New Jersey fluke fishery started with the conversion of small hand-line and trolling craft to otter trawling. These boats were 25 to 30 feet in length and were powered by means of 20- to 40-horsepower gasoline engines. The abundance of fluke and related species made this small-scale operation profitable from 1925 to 1935. A gradual replacement of small boats was begun prior to World War II. However, many of the craft continued

in use for the duration of the war because of material shortage and construction restrictions. Partial modernization was accomplished during the war by repowering with Diesels and by replacing the rope-towing warps with wire. The small draggers that remain active at this time are manned by two men. Current fleet additions are of a larger size.

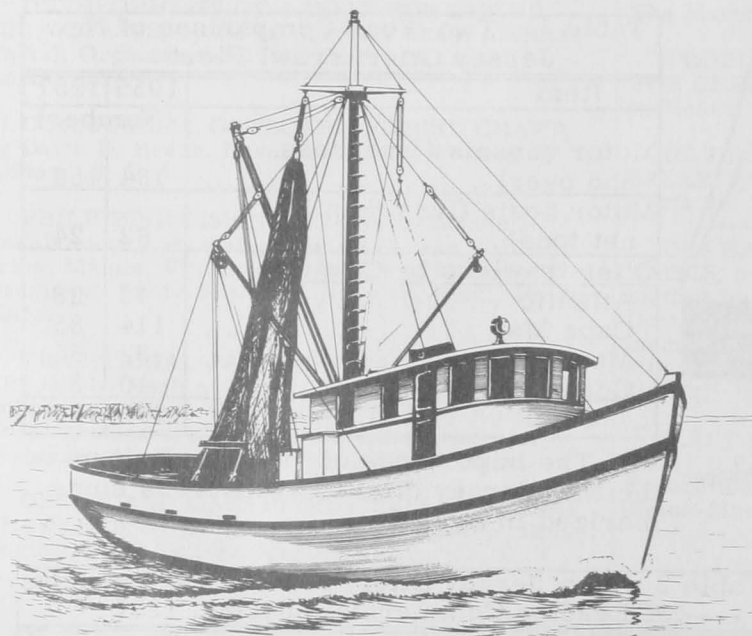


Fig. 2 - Medium New Jersey fluke otter trawler or dragger, shrimp-boat style (40-to 49 feet, length over-all).

for flatfish or round fish during the day if one type of fishing proves unproductive. The emphasis is on fluke fishing, however, because of its higher market value.

Fishing Gear: The inshore trawlers fish two distinct trawl nets, depending upon the species sought. The fluke or flatfish net has a rather large mesh and is designed to be towed at slow speed. The round fish trawl net has a smaller mesh and longer wings. The inshore boats carry both types of nets and may fish for flatfish or round fish during the day if one type of

Fishing Operations: A combined 1957 operational statement for three of the small trawlers is shown in table 4. The actual fishing season extends from May to October.

Table 4 - Average Receipts, Expenditures, and Net Returns for Three Selected Small (under 40 feet) Inshore Otter Trawlers (Fishing for Fluke in 1957)	
Average total receipts per boat	\$3,105
<u>Expenditures (average per boat):</u>	
Maintenance and repairs including marine railway charges, hull and marine engine repairs, electronic-gear maintenance and painting of a nondepreciable nature	308
<u>Other operating expenses:</u>	
Diesel and lube oils, ice, grease, etc.	419
Subsistence at sea for crew	229
Stevedoring and casual labor	30
Fishing supplies of nondepreciable nature	99
<u>Fixed charges:</u>	
Insurance	44
Depreciation	465
Fishing licenses and business taxes	43
Crew shares	396
Total expenditures and outlay (average per boat)	2,033
Net profit from 1957 fishing operations per boat	1,072

The gross stock average of the three sample boats reflects the marginal nature of this segment of the New Jersey trawler fleet.

Owners of the small draggers attempt to minimize repairs and replacements by postponing such work or by doing much of the work themselves. Diesel-engine overhauls are expensive and each operator seeks to prolong the period between overhauls.

Daily operating costs are closely controlled. The fishing crew shares in those expenses and it is to the advantage of everyone involved to maintain costs at the absolute minimum.

Fixed charges are met by the owner. The relatively low average insurance premium indicates the small coverage purchased. Hull insurance is considered too expensive. Limited in-port fire insurance and/or some sort of workman's compensation insurance constitutes the insurance coverage. The small scale of the fishing prohibits the establishment of a depreciation reserve account. The owner uses such funds as though they were part of his current earnings. Business taxes include state fishing licenses and the employer's share of employee's Social Security taxes.

The average crew share earnings for 1957 show the general condition of the New Jersey small-boat fishery. Considerable labor difficulty has been encountered by owners in recent years. Alternative employment aboard larger trawlers and clam-dredging vessels has been much more attractive to otter-trawl fishermen aboard the smaller craft.

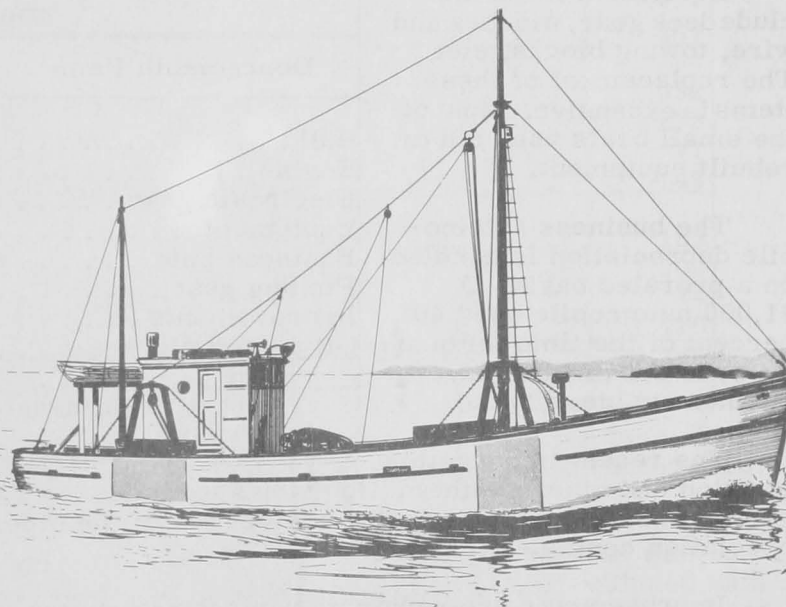


Fig. 3 - Large New Jersey fluke otter trawler or dragger (49 to 70 feet, length over-all).

Capital Investment: The accounting practice with regard to depreciation charges for capital investment is to list separately the purchase price of the boat hull, engine, electronic gear, equipment and fishing gear. The hull is normally charged at a 15-year rate; the engine, 5 years; electronic gear, 3 to 5 years; fishing equipment, 5 years; and fishing gear, 3 years. Although there is some variation in charges, experience has taught that the estimated life very nearly approximates the actual life. A newly-enforced Internal Revenue Service regulation requires that a salvage value be calculated for all charges. Thus, if the estimated salvage value of fishing vessel #1 is \$300, the basis for depreciation is \$1,200 rather than the full \$1,500 capital outlay.

Each of the three boats used in this study is more than 15 years old; two are more than 25 years old. Two of the hulls are listed as being fully depreciated. An annual charge is made on the third only because it was purchased recently. Each buyer is entitled to depreciate his business investment irrespective of what the previous owner had done.

The owners of the smaller fluke trawlers either purchased most of their electronic gear in the immediate postwar period and thus it is fully depreciated, or fish without benefit of those aids. The large initial outlay required for purchases of sounding devices, radiotelephones, loran, etc., is usually prohibitive for the small dragger owners.

Equipment items include deck gear, winches and wire, towing blocks, etc. The replacement of these items is expensive. Most of the small boats used old or rebuilt equipment.

The business automobile depreciation is handled on a prorated basis. A \$1,000 automobile used 40 percent of the time for business, is assumed to have a business value of \$400.

The recent introduction of nylon and other synthetic fibers has extended the usable life of many fishing gear items. However, much of the gear is of the older type and the three-year depreciation continues in use.

Improvements are repair or replacement items of a depreciable nature. They are not charged as repairs against a single year's operations.

Return on Investment: No differentiation is made by owner-operators between their regular share as a crew member and the boat's share of the total receipts. Very little absentee-ownership exists among small trawler proprietors. The small otter trawler is not in great demand and many of the present owners intend to use the boats until they qualify for Social Security benefits.

Available Financing: Limited commercial bank financing is used. Dock operators, net and gear suppliers, and others extend short-term credit for materials and supplies. Bank financing is used only in cases where a boat is to be replaced or renovated to a major extent.

MEDIUM-SIZED OTTER-TRAWL FLEET: The construction of the larger in-shore fleet of 40- to 49-foot vessels was greatly accelerated in the postwar years

Table 5 - Capital Investment in Three Selected Small (under 40 feet) Inshore Otter Trawlers Fishing for Fluke in 1957

Depreciable Item	Fishing Vessel		
	#1	#2	#3
	(\$)		
Hull	1,500	-	-
Engine	500	-	1,200
Electronic gear	-	375	-
Equipment	1,021	-	740
Business auto	-	-	500
Fishing gear	360	75	525
Improvements	400	117	610
Office and storage	-	2,000	1,200
Total	3,781	2,567	4,775
Average total investment per boat	3,708		

of 1946 to 1949. Most of the craft were built in Virginia boatyards. One of the most popular models is a Chesapeake "vee" bottom about 42' x 12' x 4-6'. The deck plan is that of a forecassel with a pilothouse fitted into it and a large fish hold aft. The engineroom is located below the pilothouse and forward of the hold. The most common power plant is a rebuilt Diesel of about 165 hp. The mast, booms, rigging, and two-drum winch are located aft of the pilothouse. Offshore-style gallows are not in general use. A welded towing boom of 4-inch pipe is fitted with a double towing block. Electronic gear includes a radiotelephone, loran, and echo-sounder. Otter-trawlers of this class are manned by two men.

Fishing Gear: It is aboard medium draggers that the use of both flatfish and round fish nets is most extensive. The term "round fish" includes such varieties as sea bass, sea trout or weakfish, and scup or porgy.

The change-over from one type of fishing to another is relatively simple and little fishing time is lost. This limited flexibility actually extends the working year by enabling vessel operators to take advantage of seasonal runs of round fish. As with other types of fishing, it is quite important for inshore trawler fishermen to be able to work as much of the year as possible.

 (\$).....
Average total receipts per vessel.....	7,055
<u>Expenditures (average per vessel):</u>	
Maintenance and repairs	467
<u>Other operating expenses:</u>	
Diesel and lube oils, ice, grease, etc.	1,032
Subsistence at sea for crew	253
Stevedoring and casual labor	77
Fishing supplies of a nondepreciable nature	49
<u>Fixed charges:</u>	
Insurance	185
Depreciation	1,002
Fishing licenses and business taxes	74
Crew shares	1,110
Total expenditures and outlay (average per vessel)	4,249
Net profit from 1957 fishing operations	2,806

Fishing Operations: A combined 1957 operational statement for four of the medium-sized trawlers is shown in table 6. The actual fishing season extends from May to October or later.

The average gross receipts or gross stock for the sample vessels was more than double that of the smaller boats. The larger craft are better equipped with modern fish-finding aids, efficient deck gear, and better power plants, and are manned by younger fishermen.

The larger size of hulls, the complexity of electronic equipment, and the intensity of fishing effort contribute to the high maintenance costs of the vessels. The pressure to "make do" or repair one's own equipment is not as strong here as it is aboard the smaller boats. Many of the 40- to 49-foot draggers are now approaching ten or more years of age. The costs of upkeep tend to increase with age as the accumulated ravages of wear and tear must be rectified.

Daily operating expenses reflect the differences in fishing intensity between the medium and small craft. The size and seaworthiness of the medium craft make it possible to fish in less than optimum weather. These newer draggers may be used to better advantage in the round-fish seasons when larger fish-hold capacity becomes important. Fishing for round fish requires that the net be towed at a faster

rate of speed; thus more fuel is burned per daily trip. In addition, the 40- to 49-foot trawlers are equipped with more powerful engines which consume more fuel per hour.

On the basis of an average 30-week fishing season, crew shares were not large in 1957. Not all shares are included in this amount, however. The initial cost of many of the postwar replacement vessels was such that family or other partnerships were formed and have been continued. Partners' shares are deducted from the net earnings of the vessel and are not reported as wages.

Capital Investment: The owners of the medium inshore vessels follow the same general accounting practices as previously outlined for small-boat operators.

Two of the medium vessels used in this study were built in 1947, the newest vessel in 1954 and the oldest in 1934. Only the latter hull has been fully depreciated. The amount listed for engine investment for fishing vessel #4 is somewhat inflated. Due to the need for engine replacement and simultaneous refinancing, the owners were forced to purchase a new power plant. The usual practice is to buy a rebuilt, surplus Diesel for about \$3,000. The cost of the engine for fishing vessel #6 has been included in the hull investment figure.

Depreciable Item	Fishing Vessel			
	#4	#5	#6	#7
Hull	\$4,000	\$6,287	\$ 8,200	\$ -
Engine	9,280	-	-	2,800
Electronic gear	346	-	-	-
Equipment	2,310	-	1,928	499
Business auto	400	1,800	1,040	-
Fishing gear	3,660	-	1,030	-
Improvements	1,765	1,490	1,260	350
Office and storage	-	-	-	1,050
Total	\$21,761	\$9,577	\$13,458	\$4,699
Average total investment per vessel	\$12,374			

Only the newest vessel lists electronic gear as a depreciable item. The others are equipped with this gear but it had been fully depreciated. The average equipment investment for the medium-sized trawlers was three times as much as that for the small-boat fleet.

Business automobile depreciation charges are made in the same manner as described earlier.

The fishing-gear investment for fishing vessel #4 reflects the degree of modernization and experimentation conducted by the partners of this vessel. Financial difficulties have forced them to attempt a large-scale "come back" in order to survive as independent operators in the fishing industry. With the very best of luck, however, it will take several years for them to firmly re-establish themselves.

It is interesting to note that 3 of the 4 medium vessels listed no investment in office or storage facilities. One explanation for this lies in the fact that the more efficient craft are tied economically to the dock from which they work and vice versa. The docks provide the necessary storage space and make available many other accommodations for their fishing fleets.

Return on Investment: Many of the difficulties inherent in the small-boat analysis are also present in the analysis of the newer medium inshore trawlers. The number of partnerships is large. The captain-operator's share and, in many cases, his fishing-investing partner's share are included in the net earnings of the vessel.

An active fisherman thinks of his boat as a tool for earning his living. There is some awareness of the fact that a given investment should provide a reasonable rate of return, but this is a secondary consideration.

As in the case of the smaller draggers, no serious attempt is made to set aside a reserve for depreciation. From an investment viewpoint, fishermen are faced with the same dilemma as are other small businessmen. The replacement costs of all gear and equipment items are rising; even with a depreciation reserve, the amount so ear-marked would be inadequate.

Available Financing: The better earnings, the larger investment, and the relative youth of the fishermen on the medium vessels make their owners better credit risks and thus more eligible for commercial bank credit. The credit worthiness of the individual owner is the decisive factor. Some operators must rely upon traditional credit sources such as suppliers and docks.

OFFSHORE FLUKE OTTER TRAWLERS

LARGE-SIZED VESSEL FLEET: The offshore and inshore fleets are hardly comparable. The fishing seasons are complementary: inshore, May to October; offshore, October to May. Many of the inshore vessels work almost exclusively on fluke; offshore craft seldom do.

Fishing Grounds: Inshore vessels depend upon sloughs and deeper areas of coastal waters inside the 15-fathom contour which extends 20 to 30 miles from shore. Offshore vessels normally begin fall operations somewhere between the 10- and 15-fathom line and shift gradually offshore as the season progresses, finishing the winter on the edge of the continental shelf. The area of most intensive offshore fishing effort is situated between 30 and 60 miles southeast of Delaware Bay in an area covering 1,500 square miles.

Vessels and Equipment: Offshore vessels range in length from 55 to about 100 feet. Vessels in the 60- to 70-foot class are the most numerous and seem adequate for the hard use to which they are subjected. Offshore vessels utilize marine Diesels in the 170- to 500-horsepower range. The crew of 4 to 6 men includes the captain. All of the deck gear, rigging, nets, and equipment are of heavy construction. The peak of the offshore season occurs during the winter months; the wear and tear on all equipment is heavy.

Fishing Gear: The basic otter-trawl net used is similar to that used for round fish by the medium vessels, but the twine is heavier, larger otter boards are used, and wooden rollers are employed on the bottom edge of the net.

Owners of offshore vessels attempt to keep them in operation throughout the year. However, during the years 1946-53 an estimated 90 percent of the fluke

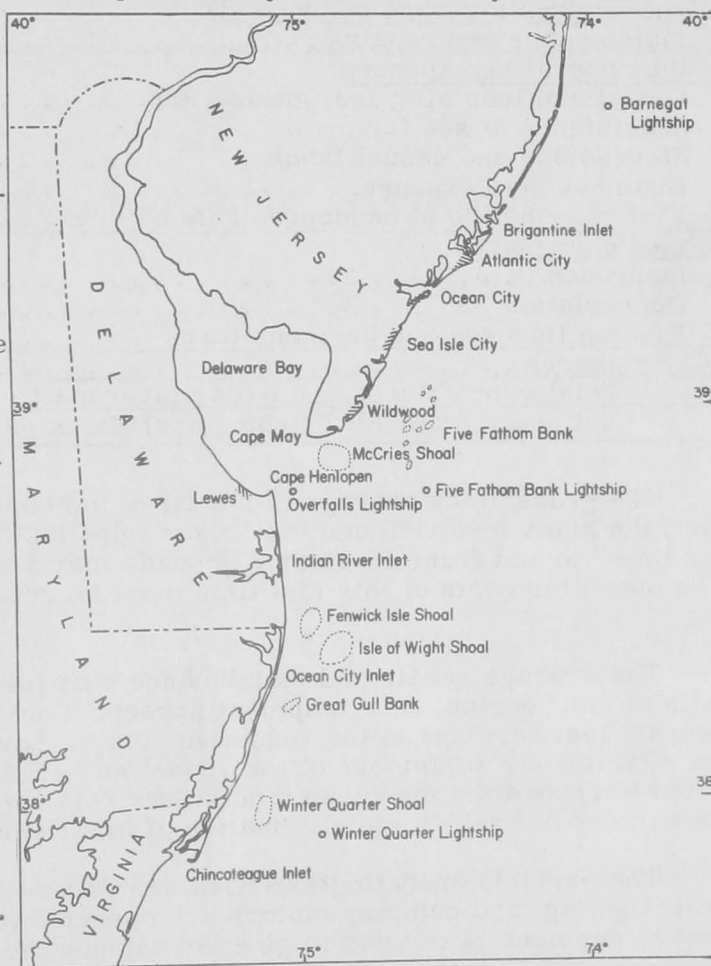


Fig. 4 - Chart of fishing ports and grounds near New Jersey.

during the winter

landings of the large otter trawlers were made in the October to May period of each year (June and Reintjes 1957). The situation has not changed substantially since then. Off-season types of fishing include trawling for lobsters and dredging for sea scallops. These supplementary operations are necessary in that they pay their share of fixed annual costs and tend to keep the fishing crew intact and employed. Despite the advantages of 12-months fishing operations, many of the offshore craft remain idle during the summer season. Engines, hull, fishing gear, and equipment are overhauled thoroughly.

Fishing Operations: A combined 1957 operational statement for five offshore large trawlers is presented in table 8.

Average total receipts per vessel		\$35,787
<u>Expenditures (average per vessel):</u>		
Maintenance and repairs	3,019	
<u>Other operating expenses:</u>		
Diesel and lube oils, ice, grease, etc.	7,890	
Subsistence at sea for crew	1,180	
Stevedoring and casual labor	369	
Business auto expense.	86	
Fishing supplies of nondepreciable nature.	352	
<u>Fixed charges:</u>		
Insurance	1,702	
Depreciation	2,933	
Fishing licenses and business taxes	269	
Crew shares	12,022	
Total expenditures and outlay (average per vessel).	29,822	
Net profit from 1957 fishing operations per vessel		5,965

The gross stock average is not large in relation to the intensity of fishing effort, the risks involved, and the longer trips lasting a week or more. The "steaming time" to and from the fishing grounds may amount to 12 to 24 hours or more. The operating costs of this lost time must be recovered from the few days of fishing.

The average repair and maintenance charges indicate the attention paid to details of hull, engine, and equipment upkeep. Lost time on the fishing grounds represents lost earnings to the vessel and crew. Lives and investment depend upon the over-all seaworthiness of the vessel and gear. A month in early summer is devoted to renovating the vessel and gear. This investment of time and money more than pays for itself in the elimination of lost fishing time.

The per-trip operating expenses are relatively high. The main propulsion unit, lighting, and pumping motors are operated on a continuous basis. An experienced engineer is carried to give the engines the constant maintenance required.

Stevedoring and casual labor charges are encountered when a trip is landed in other than the vessel's home port. The business automobile charge represents a prorated share of such costs incurred by the owner while on vessel business in port. The fishing supplies cost covers nondepreciable items.

Average insurance costs include those for the vessel and her crew. The risk of accident is always present in the offshore fishery. Insurance rates are high enough to work as an effective limitation on the amount of coverage purchased.

Average depreciation charges indicate the large investment required in the offshore fishery.

The business taxes charge includes the vessel's share of the crew's Social Security taxes and other incidental taxes.

The crew-share earnings are calculated for division among three men with a per-man average of about \$4,000. The fishing captain is normally an owner or partner and his share is deducted from the vessel's net earnings.

Capital Investment: The hull investment for fishing vessel #8 is low in relation to the other trawlers because it was built in a low-cost area of Virginia. The cost

Table 9 - Capital Investment in Five Selected Large (over 49 feet) Offshore Otter Trawlers Fishing for Fluke in 1957

Depreciable Item	Fishing Vessel					
	#8	#9	#10	#11	#12	
Hull	\$ 8,500	\$15,300	\$14,000	\$13,570	\$31,000	
Engine	4,000	3,200	13,300	7,220	24,389	
Electronic gear	350	362	1,025	-	-	
Equipment	3,585	2,887	-	2,301	1,800	
Business auto	1,425	1,750	-	2,100	1,000	
Fishing gear	1,397	933	-	2,800	3,500	
Improvements	500	1,508	5,860	1,600	4,650	
Office and storage	1,200	-	-	100	-	
Total	\$20,957	\$25,940	\$34,185	\$29,691	\$66,339	
Average total investment per vessel						\$35,422

of hulls #9, #10, and #11 are typical for vessels of this size and service. Vessel #12 is larger, over 100 feet in length, and was built in a high-cost period, 1943.

Rebuilt Diesels power vessels #8 and #9. Vessel #10 has been recently repowered with a new, heavy duty Diesel and the production and earnings record of this vessel after the installation of the new engine shows the advisability of the action taken. Vessel #11 was purchased used and fully equipped; the total cost was much less than if the vessel had been bought new. The power plant of vessel #12 is officially rated at 500 horsepower. The engine is more than adequate for fishing use but operating and maintenance costs are quite high.

Recent loran installations account for the similar electronic gear investment in vessels #8 and #9. Vessel #10 has undergone extensive replacement of fully-depreciated items as part of an almost complete renovation. The electronic gear aboard vessels #11 and #12 is totally depreciated.

The equipment investment in three of the vessels, #8, #9, and #11, indicates shifts to other types of fishing; that of #10 has not been replaced; that of #12 represents major repairs to damaged deck gear.

The business automobile depreciation charge is made in the same manner as the comparable charge by small-boat owners.

The fishing gear investments in vessels #8, #9, and #11 are indicative of changes in operations. The sizable gear investment in vessel #12 represents the replacement of lost and damaged gear.

The newness of vessel #8 has meant that no large-scale improvements were necessary. The improvements listed for vessel #9 and #11 are nominal and were probably made to compensate for normal wear and tear. Vessel #10 and #12 have undergone extensive overhauling.

Office and storage depreciation charges are not shown for 3 of the vessels; one other lists a nominal charge. The remaining vessel's depreciation charge is made

because of the type of operation conducted by the owner. The latter vessel shifts from dock to dock according to the operator's estimate of where he can receive the largest price for his landings. This degree of independence exacts its toll in that private storage and office facilities must be maintained. The owner is of the opinion that the additional investment and maintenance costs are offset by the higher prices received and that he actually earns an annual profit on his extra investment.

Return on Investment: It is assumed that the captain's share amounts to no more than his regular crew share of \$4,000. This would provide a remainder of \$1,965, presumably the net return on investment. On an average investment of \$35,422 the rate of return would be calculated at about 5 percent. The risk nature of the investment, the ever-increasing costs of replacement, and the more attractive, less uncertain return offered by alternatives are factors which render this rate of return rather low by comparison with other investment opportunities.

Available Financing: The owners of offshore vessels are required to make a substantial initial investment. The sale of a previously-owned vessel or other equity provides the down payment. Bank financing is extended to buyers having good credit standing. However, when bankers are unwilling or unable to finance the purchase, the seller may be of assistance by accepting a vessel mortgage on the unpaid balance. The term of these mortgages is 3 to 5 years. During the period of repayment, the new owner must carry full vessel insurance. The costs of insurance and interest are deducted from the boat share which totals 35 to 40 percent of the gross stock. The interest and insurance costs are legitimate business expenses, chargeable against the business activities of the year in which paid. Mortgage payments are not expense items for tax purposes. The total purchase price, less salvage value, is listed on the depreciation schedule for the year in which the hull, engines, and equipment were bought. The total depreciation amount chargeable is often less than the actual mortgage payments. This method of accounting works a hardship on the purchaser. Operations must be intensive to meet the added expense of interest and insurance, mortgage payments, and other incidental added costs. The larger gross stock which accompanies such intensity normally results in a greater net profit; this in turn leads to a large income-tax liability.

The 35 to 40 percent boat share is set aside in a regular bank checking account. Maintenance and other costs are paid out of this account. It also provides a source of capital for future business expansion.

Usual credit sources such as suppliers and ship chandlers, dock operators, and others are open to offshore fishermen. These forms of credit are usually of short term and are on a more or less informal basis.

New Credit Source: The recently-created Federal Fisheries Loan Fund will probably be of greatest importance to the offshore fleet. Profit records, the amount of owner equity, and other considerations seem to enhance the credit standing and eligibility of this group.

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