Section 3

AN OVERVIEW OF NEW ENGLAND'S COMMERCIAL FISHERIES

Stephen Olsen

Coastal Resources Center

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FISHING AND PETROLEUM INTERACTIONS ON GEORGES BANK

VOLUME II: THE CHARACTERISTICS OF THE TWO INDUSTRIES, POTENTIAL FUTURE TRENDS, AND AN ASSESSMENT OF FORESEEABLE CONFLICTS

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NEW ENGLAND REGIONAL COMMISSION

INTRODUCTION

In this section the principal characteristics of New England fisheries are briefly discussed. Economic aspects are stressed throughout the discussion. Fisheries are frequently overlooked as an important renewable natural resource that plays an important role in the economies of many communities. Although the value of fish landings is not great when compared to the value of the output of some other industries, each dollar in landings generates a large amount of economic activity and provides a substantial amount of personal income.

THE FISH HARVESTING SECTOR

The economic health of the New England fish harvesting industry generally compares well with its counterparts in, for example, West European nations,[1] when one measures productivity in terms of unit output per inputs of labor and capital. This judgment takes into account the fact that although the domestic fishing industry, unlike the European, is not subsidized, New England crewmen earn more than West European crewmen (approximately 50 percent more than Norwegian, 100 percent more than Icelandic, and perhaps 200 percent more than Newfoundland crewmen [Holmsen, 1976]). It should be remembered too that vessels and gear are far more costly in New England than in Europe due to tariffs and embargoes.

The New England fishing industry is a fragmented one and the health of individual fleets varies considerably from port to port. This variation is due less to catch rates and fish prices than to the structure of the industry in a particular location. The most important determinant of success is flexibility - in a vessel's fishing ability, in the marketability of the catch and in profit-sharing arrangements between vessel owners and crew. Fleets dependent on one species and one gear type have not fared well.

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[1] In this section, several comparisons will be made between domestic and West European fisheries; we do this in part because we may expect competition between the two under extended national jurisdiction offshore.

In ports where the share (lay) agreements between vessel owners and crewmen have not reflected the drastic increases in investment necessary to make a fishing operation viable, the health of the fleet has also declined. The character of individual ports is reflected by investments in fishing vessels. In Boston, for example, the fishing fleet has declined in size steadily in recent decades, while at Point Judith new vessels have been added to the fleet each year.

The Earnings of Fishermen

Working conditions of fishermen are so different from those of the onshore labor force that it is hard to make a meaningful comparison of their incomes. Crewmen on vessels working out of southern New England ports such as Point Judith and New Bedford may make $14,000 to $16,000 a year and a few may earn twice as much. Fishermen on boats and small vessels working from small rural ports, however, frequently make much less. The average amount of time spent at sea in a year is in the vicinity of 130 to 160 days. However, in port crewmen are expected to work on the vessel and gear without pay. It must also be remembered that a day at sea on a fishing vessel is very different from a day's work ashore. There is little time for sleep and, even on a day-trip vessel, work commonly begins at 4 in the morning and ends at 5 or 6 at night. Fishermen work in dangerous and often highly uncomfortable conditions. There are few, if any, fringe benefits; there are no paid vacations or provisions for sick leave.

The high earnings of many fishermen are a relatively recent phenomenon that began in the early 1960s as high catch rates and low prices gave way to low catch rates and steadily rising prices. The low volume of catches has also reduced the size of crews and thus increased each man's share of the gross stock (sales value of the catch). In some ports during the 1960s the crew share of the gross stock increased so much that virtually no new vessel entered the fleet. More recently, capital appears to have increased its share in the profits in non-unionized ports and the situation has stabilized in union ports. In New Bedford for example, labor made significant gains in the three-year contract settlements in 1967 and 1970. The 1973 contract did not significantly change the proportion of shares between fishermen and vessel owners and

the port is still working on that contract on a one-year extension. It should be noted, however, that the large share received by crewmen combined with considerable increases in all expenses for vessel owners has not made the fishing industry attractive to investment.

The Lay System

In most European countries with important fisheries, fishermen have a guaranteed minimum wage, but in New England earnings are solely dependent on the success of individual fishing trips. The crewmen's share is calculated in varying ways from port to port and even among vessels in a single port. Only in unionized ports such as New Bedford are the lays, or shares, consistent and even in this one port there are three different lays, one for scallopers, one for large trawlers and a third for small trawlers.

The lay system enables the vessel owner to transfer a part of the risk of fishing to the crew. The lay systems can be classified as either "broken" or "clear." In a broken lay, expenses incurred on each trip are first deducted from the gross stock and the remainder is divided between vessel and crew according to a pre-established formula. Trip expenses include items such as food, ice, unloading the catch (known as lumping) and welfare and pension fund contributions (usually a percentage of gross stock). Thus, if a vessel is sailing on a broken 45 lay it means that the vessel takes 45 percent of net stock (gross stock minus trip expenses) and the crew 55 percent. In some cases, food expenses are not considered a trip expense and are deducated from the crew share. In either case, the crew share is divided equally among the men on the vessel. Normally, a hired captain receives, in addition to a crew share, 10 percent of the vessel share for management. Officers, such as engineers, mates or cooks, may receive a bonus. Bonuses would normally be considered a trip expense. An example of how the system works is given in Table 1; the data is a year's gross stock for a 75-foot trawler with a crew of four sailing on a broken 45 lay (Holmsen, 1976).

Under a clear lay, the gross stock is split between vessel and crew and the various trip expenses are deducted from the vessel's share or the crew's share according to a previous agreement. On a clear 40 lay, 40 percent of the gross stock would go to the boat and 60 percent to the crew. Yet another lay is used by some vessels in the

TABLE 1

THE LAY SYSTEM: ANNUAL GROSS STOCK FOR A 75 FOOT TRAWLER WITH A CREW OF 4 SAILING ON A BROKEN 45 LAY

Gross Stock		$180,000
Trip expenses:		
Fuel, oil, grease	$15,000	
Ice	4,700	
Lumping (Unloading the catch)	2,700	
Officer's Bonus	600	
Welfare & Pension	2,600	
Total Trip Expenses		25,000
Net Stock		$155,000
Crew Share (55% of net stock)	$85,250	
Food	3,500	
Net Crew Share		$ 81,750
Net Crew Share Per Man		$ 20,433
Boat Share (45% of net stock)		$ 60,750
Boat expenses:		
Captain's 10%	$ 6,975	
Repairs & Maintenance	7,025	
Gear & Supplies	8,000	
Insurance	7,500	
Payroll Taxes	5,000	
Wharfage	1,000	
Business Taxes	500	
Officer's Compensation	500	
Clerical & Legal	1,000	
Transportation & Travel	1,000	
Office Expense	400	
Miscellaneous	1,600	
Total Expenses		$ 40,500
Balance for interest & depreciation		20,250
Depreciation (10% of market value)		17,000
Return to Total Assets		$ 12,250

port of Gloucester. This is the Italian lay, in which the size of the crew is taken into consideration in determining the division of the gross stock between vessel and crew.

Return to Capital

It might be expected that in a given port and for a given fishery the size and type of vessel would determine the economic return. Several empirical studies have shown, however, that the quality of the captain is by far the most important factor.

To determine returns to labor is relatively easy, but to determine the percentage return to capital is not. There are several measures of return to capital, each suitable for a particular purpose; additionally, it is necessary to make judgments on the size of the investment and the rate of depreciation. Income tax data are not sufficient to determine the economics of a vessel or a fishing fleet. To accurately assess the economics of the New England fishing fleet one would need data that have never been systematically collected. Records for a few vessels in particular fishery for a particular gear exist but this could be misleading if used to generalize about an entire fleet or fishery.

The reduction in size of the New England fleet over the last decade suggests that the return to capital has been low. Vessel owners and potential investors may have been influenced, however, more by the uncertainty of the industry's future than by current earnings. The recent bill extending national jurisdiction over fisheries has significantly reduced the uncertainty for investors in the fishing industry.

Major Costs

The cost of fuel has doubled over the last few years and at present may account for nearly 10 percent of the value of the catch for an average size trawler. This expense affects crew income as much as or more than the income on investment. The major expenses paid by the vessel owner can be put into the following three categories: repairs and maintenance, gear and supplies, and insurance, with a fourth category increasingly important, namely payroll taxes. Insurance rates for hull insurance, and particularly for protection and indemnity (third party) insurance have been bothersome to the industry for many years. While vessel owners have complained bitterly about it, few have taken any action. Where fishermen have joined with insurance groups, savings have been considerable.

The inflation that has affected fish prices has also affected all fishing operations. In addition, social security taxes, unemployment taxes, new state taxes and deductions for welfare or pension have taken an increasing share of the gross stock.

Vessel Financing

Lacking the unified fishing policy that many other nations enjoy, the United States has resorted to a variety of programs. Sometimes the effect of one program has partly offset the effect of another. The lack of a unified fisheries policy has been reflected in the several vessel-finance programs that have been implemented and then canceled after a few years of operation. At present there are loan guarantees but no government loan program for fishing vessels. Under the Obligation Guarantee Program, administered by the National Marine Fisheries Service, fishermen may obtain mortgage guarantees on 75 percent of the cost of construction or reconstruction of vessels, but not on the purchase of a used vessel. The Small Business Administration may also guarantee loans through commercial banks.

The funds needed to finance New England vessels come from the private sector, either banks or individuals. The Farm Credit Administration, through its Production Credit Associations, now lends to fishermen and has entered the market on a small scale. The best opportunity for vessel owners is the Capital Construction Fund, into

which earnings from a vessel can be deposited before taxes, to be used toward construction, reconstruction or purchase of another vessel. While fishermen buying their first vessel cannot make use of this program, it is of significant help in upgrading a fleet by making it possible to replace or rebuild vessels with pre-tax dollars.

In recent years a new trawler built to the best standards in yards that have traditionally supplied New England fishermen has risen in price enormously. Today such a vessel in the 75- to 80-foot range, complete with engine, winches and standing rigging but without fishing gear or electronics, costs $400,000 to $500,000. A similar vessel would have cost less than half of this a decade ago. Such high prices have caused many New England fishermen to buy "Southern boats" built to a standard design in the Carolinas and further south. These vessels are neither as solid nor as seaworthy as traditional New England trawlers but cost far less. a 75- to 80- foot Southernbuilt trawler of standard design with no frills costs $175,000 to $200,000 (Taber, 1976). There is considerable discussion about how successful such vessels might be fishing distant grounds on Georges Bank in the winter, but they are being purchased in considerable numbers.

Marketing

In two ports, Boston and New Bedford, virtually all of the catch is sold at auction. In New Bedford, buyers must purchase the whole vessel load, while in Boston buyers may purchase a part of a vessel's catch. In Provincetown, Chatham and Point Judith, half or more of the landings are sold through cooperatives. The cooperatives market most of their product as round (whole) fish and ship on consignment. Co-ops have recently been working on a 7-cent-a-pound "spread" on food fish (rapidly rising costs are increasing this figure). This means that the price obtained by the co-op minus 7 cents a pound goes to the vessel. The 7 cents covers the co-op's expenses for such things as culling, packing, transportation to markets, selling, management and overhead.

Once the fish is landed in New England, it enters a complex marketing system based on a series of interrelated physical and economic factors extending throughout the region. The following is a brief description of the principal production and marketing regions that are recog-

nized as distinct from one another by dealers in the fish marketing business (Charles, 1976).

Maine: This includes all small ports in Maine as well as New Hampshire and Massachusetts ports south to Gloucester. It does not include Rockland and Portland, which are considered a distinct entity with productive fisheries that concentrate on red perch and herring. "Maine" includes a great variety of fisheries, including those for eastern herring and northern shrimp. Interrelationships with Canada are complex. The Maine region has close marketing relationships with Gloucester.

Gloucester: This is known as a "volume port" and is the national distribution center for frozen fish products. Prices for fresh fish shipped from Gloucester are in large part established in Boston since Gloucester has no market of its own. Interviews with dealers in fresh groundfish indicate that approximately 75 percent of their product is sold in Boston, 20 percent in New York City and 5 percent to local filleting plants.

Boston: Though it has declined dramatically as a fish-landing port, Boston is of central importance as a marketing and distribution center with major outlets outside the region. New York is a minor outlet compared to the Midwest and "South" (Philadelphia to North Carolina). The surviving Boston trawlers are large and are becoming more profitable as fish prices rise. A number of Gloucester vessels also frequently land in Boston.

South of Boston: This region extends south as far as New Bedford and includes all the Cape Cod ports, the most important of which are Provincetown and Chatham. Dealers in these two ports estimate their market outlets, measured by volume, as follows: New York City 70 to 80 percent, Boston 15 to 25 percent; "South" 0 to 5 percent and retail outlets in New England 2 to 8 percent. Many vessel captians in these small ports sell their catches directly to major markets and pay their own handling and shipping. Smaller ports are frequently more closely related to New Bedford and Boston markets. The most lucrative markets are local retail and restaurant outlets.

New Bedford: The focal point for fisheries in southern New England, New Bedford focuses its economy on its fishing fleet, fish processing industries and a wide range

of support services. In New Bedford the emphasis is high-value, high-quality products, and flatfish are traditionally the most important species group handled. New Bedford is also the center for the New England sea scallop fishery. The prices established each day at the New Bedford fish auction are the most important ex-vessel species price criteria for the region and also serve as a benchmark at the Fulton Fish Market in New York City. Fish sold by New Bedford dealers find their most important outlet at the Fulton Market; Boston may account for 5 to 10 percent and "South" for as much as 30 percent for some dealers.

Point Judith: The textbook example of a successful "rural port," Point Judith owes its success to its Fishermen's Cooperative. The co-op has established markets for a highly diversified mix of fish and has encouraged its members to experiment with new gear and fisheries. Fish are sold approximately as follows: 70 percent to New York City; 15 percent "South" and minor amounts to Boston and other outlets in the region.

The New England fish marketing system is founded on an intricate communications network conducted by telephone among a number of individuals who have developed personal business relationships over the years. Every day these people market a highly perishable product that, unless cold storage facilities are available, must be sold and moved within a few hours of landing. The prices for individual species often fluctuate widely from day to day. In many cases the same fish are bought and sold several times as buyers work to produce the "mix" required in a particular outlet. The business is complicated by a variety of factors peculiar to it. These include the unpredictability of fishing which makes it difficult or impossible to forecast the volume and species mix that will be landed each day, and the resultant fluctuation in prices. The weather also plays an important role in the volume of landings. Since fishermen demand quick payment for their catches, most dealers are pressured by a lack of working capital. In response to these factors, dealers tend to develop highly individualistic businesses tailored to specific local needs and opportunities.

In rural areas fishermen operate from small ports and isolated landings. Unlike their counterparts in agriculture, rural fishermen seldom enjoy the benefits of a cooperative to provide them with supplies and services and to market their produce. Fishermen need, at a minimum, boxes, ice and fuel to operate and in rural areas these basic amenities may be hard to come by. This frequently limits local fisheries. Perhaps more important is a chronic shortage of trucking and trustworthy, capable buyer to market their catches and pay the fishermen a fair price. Even in ports that have an established buyer, facilities are seldom present that permit fish to be stored and held off the makret so that a large order can be put together. If storage facilities are available, fish do not have to be sold on days when prices are low. The fish marketing system is still geared to the marketing situation of a decade or more ago when unit prices were low, volumes were high and the first priority of a buyer was to move the fish landed as quickly as possible. Today prices are high, volumes are low, and it may be very profitable to hold fish to take advantage of rapidly fluctuating prices.

TRUCKING

After it is sold, all fish landed by New England fishermen is moved by truck. Though seldom recognized, the trucking business is an integral part of the fishing industry. Inadequate trucking facilities frequently severely limit the marketing of fish landed in small outlying ports. Approximately 15 trucking firms in the region specialize in fish. A typical firm owns 25 tractors and 50 trailers and moves some 30 million pounds per year, employing 25 drivers and two full-time mechanics. Each rig is worth some $50,000 to $75,000. New England-based truckers specializing in fish may be estimated as follows: Maine, 75 to 80 rigs; Massachusetts, 300 rigs; Rhode Island, 100 rigs; Connecticut, 50 rigs. Fully as important as the New England trucking firms are a great number of "gypsy truckers" from outside the region who own and operate their own rigs. Brokers for these truckers are concentrated near Seekonk and Rehoboth, Massachusetts. More than 1,000 gypsies haul fish on return trips from New England.

FISH PROCESSING

In 1974 there were 226 food fish processing plants operating in New England (Table 2). Fish processing activity is heavily concentrated in two states, with 47 percent

TABLE 2

NUMBER OF PLANTS AND EMPLOYMENT IN THE FOOD FISH PROCESSING INDUSTRY, BY STATE, NEW ENGLAND, 1974.

State	Number Of Plants	Employment Peak	Employment Average
MAINE	92	4,366	3,292
NEW HAMPSHIRE	9	423	325
MASSACHUSETTS	107	4,679	3,892
RHODE ISLAND	14	297	244
CONNECTICUT	4	28	24
TOTAL	226	9,793	7,777

SOURCE: Based on unpublished data prepared by Virgil Norton, Department of Resource Economics, University of Rhode Island.

of the plants located in Massachusetts and 41 percent in Maine. Average employment in the industry was about 7,700 with peak seasonal employment about 9,800.

Fish processing plants specialize in one or more of the following categories of products:

1. The preparation of fresh fish.

2. The packaging of raw or cooked frozen fish.

3. The cooking and canning of seafood such as tuna and crab.

4. The smoking and curing of fish such as herring and codfish.

Sixty percent of the fish processing plants in New England in 1974 primarily produced fresh fish products (Table 3). However, fresh fish processing plants tend to be small, family-run operations employing an average of 30 to 40 workers (Capalbo, 1976). Fresh fish processing plants accounted for only about 20 percent of the total value of the processing industry's production.

In contrast with fresh fish processing, frozen fish plants are usually large, automated establishments with an average employment per firm of 240 workers (Capalbo, 1976). Only 29 percent of New England's fish processing plants produce frozen fish products but these firms account for about two-thirds of the total value of the region's fish processing production.

Fish processing plants may produce more than one product, and a number of plants are involved in the distribution of fish products as well as with processing. Twenty percent of all fresh fish plants both processed and distributed their products. Twenty-five percent of all frozen fish processing plants produced more than one product type, and 5 percent of all frozen fish plants distributed as well as processed frozen fish products.

TABLE 3

NUMBER OF FISH PROCESSING PLANTS AND VALUE OF OUTPUT, BY TYPE OF PRODUCT, NEW ENGLAND, 1974

TYPE OF PRODUCT	NUMBER OF PLANTS[a]	PERCENT	VALUE OF OUTPUT (million$)	PERCENT
Fresh	159	60%	$ 61.5	20%
Frozen	75	29%	210.5	67%
Canned	21	8%	38.3	12%
Cured	7	3%	1.9	9%

SOURCE: Based on unpublished data prepared by Virgil Norton, Department of Resource Economics, University of Rhode Island.

[a]Includes duplication of plants involved in the production of two or more product types.

TABLE 4

DISTRIBUTION OF FOOD FISH PROCESSING PLANTS, BY NUMBER OF EMPLOYEES, NEW ENGLAND, 1974

NUMBER OF EMPLOYEES	% OF TOTAL PLANTS
0-5	29%
6-20	38%
21-50	14%
51-100	11%
101-200	5%
201-500	3%
	100%

SOURCE: Capalbo, S.M. 1976. An analysis of the market structures of the food fish processing sector of the United States fishing industry. Unpublished Ms. University of Rhode Island, Kingston, R.I.

ECONOMIC MULTIPLIERS

In attempting to assess the full economic impact of an industry on the local or regional economy, it is customary to apply multipliers that indicate the direct and secondary economic effects of the revenue generated by that industry. When multipliers are used, it must be assumed that labor is available within the region at existing wage rates.

Multipliers for marine industries have been calculated in a study by Rorholm et al. (1976) of the southern New England region (eastern Connecticut through Cape Cod). Although this study is based on only a portion of New England, the results provide a general insight into the direct and secondary impacts of commercial fishing and other marine industries on the New England economy. A URI Sea Grant-funded study that is now under way will update the information first developed by Rorholm et al.

Two kinds of multipliers are commonly used: (1) general multipliers and (2) personal income multipliers.

General Multipliers

Table 5 lists the general multipliers for each of the 13 marine sectors studied by Rorholm et al. Each general multiplier, when applied to a change in the output of a sector, provides a measure of the change in output, both direct and indirect, that results in the region. For example, a $100 increase in fish catching will result in a total increase in regional output of $296. While it is useful to understand the impact of an activity on the total economic output of a region, it is often more important, especially when a public policy is being considered, to identify the impact of an economic activity on the region's personal income.

Personal Income Multipliers

Table 5 also lists the multipliers that are used to calculate the direct and indirect effects on personal income (mainly wages and salary, payments to management, interest and profits) of a change in the output of the 13 marine sectors. For example, a $100 increase in fish catching will result in a total increase in personal income of $118, and an increase of $100 in frozen fish processing results in a total increase in personal income of

TABLE 5

GENERAL AND PERSONAL INCOME MULTIPLIERS FOR MARINE SECTORS, 1965

Sector	rank in personal income multipliers	personal income multiplier	general multiplier
Fish catching	2	1.18	2.96
Fresh fish processing	6	1.07	3.32
Frozen fish processing	4	1.16	3.74
Wholesaling and jobbing	5	1.09	3.41
Ship and boat building	11	.71	1.99
Marinas and yards	9	.94	2.76
Marine retail and wholesale	10	.87	2.75
Marine manufacturing	8	.95	2.37
Constr., towing, agts.	12	.64	1.97
Research and education	13	.62	1.95
Marine military	1	1.22	2.73
Charter fishing	3	1.17	3.08
Other marine	7	.96	2.68

Source: Rorholm, N., et al., 1967.

$116. Multipliers for fishing-related sectors tend to be high because a comparatively large fraction of their labor and nonlabor purchases are made locally.

Table 6 provides more detail on the economic effects of a change in the fish catching sector. The first column summarizes how $100 produced by fish catching is spent (direct purchases). The largest share is received by "households" ($66.71) and consists primarily of payments to personal income. The second column lists the direct and indirect purchases generated by a $100 increase in fish catching. Households receive $117.62 (which accounts for the personal income multipliers of 1.18 in Table 5). Total purchases amount to $296.09 (and thus the general multipliers of 2.96).

EMPLOYMENT IN FISH HARVESTING

Figures A through E show trends in the numbers of commercial fishermen in the region and in each New England state during the period 1950-1972. These data are collected by the National Marine Fisheries Service (NMFS) and appear in their annual Statistical Digests. The figures indicate that the numbers of fishermen declined slightly starting in 1950 but have been increasing in recent years. Regular fishermen, as defined by the NMFS, are individuals who spend 50 percent or more of their working year in commercial fisheries; fishermen defined as casual spend less than 50 percent of their time in commercial fisheries.

Fishermen are unionized in the ports of New Bedford and Gloucester. In Gloucester, the Atlantic Fisheries Union has some 250 members, the majority of whom work on the larger company-owned vessels. Fishermen in family-owned and operated vessels are usually not unionized. The New Bedford Fishermen's Union claims some 1,000 members, of whom 600 to 700 are active. Some of the fishermen who work out of Boston are also unionized and belong to either of the two unions. In both Gloucester and New Bedford the lumpers (men who unload the catch) are unionized (Peterson, 1976).

TABLE 6

ECONOMIC INTERDEPENDENCY COEFFICIENTS
FOR FISH CATCHING SECTOR
SOUTHERN NEW ENGLAND MARINE REGION
1965

Sector	Purchase for each $100 of fish catching		Sales to Each Sector per $100 Output of Fish Catching[a]
	Direct	Direct & Indirect	
Fish catching	0.0616	100.7138	.062
Fish processing	0.0	0.0394	22.977
Fish froz. proc.	0.0	0.0027	34.220
Fish whsl. & job.	0.0	0.1173	24.444
Ship and boat bldg.	0.0	0.1873	0.0
Marinas and yards	5.4195	5.7137	0.0
Marine whsl. & ret.	1.3354	3.0109	17.749
Marine manufacturing	1.7501	1.8623	0.0
Constr., towing, agts.	9.9510	10.1114	0.0
Research & education	0.0	0.0088	0.0
Marine military	0.0	0.0942	0.0
Charter fishing	0.0	0.0011	.058
Other marine	0.0	0.2186	0.0
Other econ. act.	12.1524	45.6902	.490
Households (includes labor, profit and other income)	66.7071	117.6235	0.0
State and local govt.	2.6228	10.6967	0.0
Federal govt.	0.0	0.0	0.0
Rest of New England	0.0	0.0	0.0
Rest of world	0.0	0.0	0.0
Total	$100.0	$296.0913	$100.0

Source: Rorholm et al (1967, pp. 83-88)

[a]Calculated by dividing interindustry flows from fish catching sector by the total output of the sector. Figures are rounded to three decimal places.

Note: Page 93 has been deleted.

TRENDS IN NEW ENGLAND LANDINGS 1950-1975

Introduction

In this section trends in New England's fisheries from 1950 through 1975 are reviewed by examining the value and volume of landings as reported by the National Marine Fisheries Service (NMFS)[1]. The data have been organized by region and by state and trends are discussed by broad species and gear groups. It is recognized that NMFS fisheries statistics are sometimes not as accurate as one would wish but they are the only comprehensive and consistent series of landings data available. Throughout this section, all dollar figures are in constant 1974 dollars. The study period 1950-1975 is arbitrary but offers a convenient time frame, making recent trends in landings apparent.

Figure 1 clearly shows that the volume in pounds of New England landings has suffered a dramatic decline in the last quarter century with 1975 landings down 54.5 percent from 1950. Despite the decline in volume, the value of landings began a clear increase in 1970 because of a rise in the unit price of foodfish and the growth of a lucrative offshore lobster fishery. The value of landings increased 74 percent over the study period, compared with a 55 percent increase in regional personal income.[2] The downward trend in volume is due primarily to gross overexploitation on offshore grounds of nearly all traditionally important finfish stocks; less important is the slow but steady decline of coastal fisheries for mollusks and other fishery products. Offshore, the problem may be blamed primarily on fleets of foreing fishing vessels that, beginning in the late 1950s, began taking

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1 Data for years preceding 1973 were taken from the Fishery Statistics of the United States Statistical Digests; data for 1973, 1974 and 1975 were obtained from monthly landing summaries for individual states. Data from the latter source are subject to revision by NMFS.

2 Unfortunately data for gross regional product and gross state products are not available for 1950. Personal income data, which closely parallels gross product data, are used instead as an indicator of general economic trends.

immense volumes of fish on New England grounds, particularly in the Georges Bank area (Figure 2). In 1974, the latest year for which foreign fishery statistics are available, the United States took only 13.3 percent of the catch on Georges Bank (ICNAF area 5Ze) but 29.5 percent of the catch in ICNAF area 5 (Figure 3).

In the past, fisheries outside the 12-mile contigous zone have been regulated by the International Commission for North West Atlantic Fisheries (ICNAF). The Commission failed to impose meaningful resource management largely because it lacked effective enforcement capability. Under ICNAF, nations were responsible for acting against their own citizens who broke ICNAF catch quota agreements. It is well known that many nations took little or no action against offending skippers. It is also recognized that ICNAF catch statistics as they were reported by individual nations reflect smaller catches than those actually taken in certain fisheries. Since 1973, when United States inspectors were permitted to examine catches below decks on foreign vessels operating off our coast, the data have become more accurate. ICNAF management will end in March, 1977, when the United States assumes jurisdiction over all fishery resources within a 200-mile resource zone. It is hoped that under United States management, overfished stocks will be permitted to recover and that New England fisheries will improve. The potential effects on New England fisheries of extended national jurisdiction over fishery resources are discussed in Section 4.

Regional Trends

A longer historical view than the one taken in this discussion shows that New England fishermen, since the time of the first settlers, have overexploited one fishery after another. In the past, when one fishery declined other species could be concentrated upon or more efficient gear developed to increase catches. In southern New England, for example, handline and seine fisheries were replaced by fish trap fisheries in the mid 19th century and traps were superseded by trawlers in the 1930s. With the demise of each fishery the overall abundance of available fish declined (see Olsen and Stevenson, 1975; McHugh, 1972). Overfishing is a topical subject today but was no less so in the late 19th century when congressional inquiries were undertaken into highly

disturbing declines in fishery resources. Unfortunately, the measures taken at the time to check overfishing were ineffective (Bard, 1873). The problem of overfishing has been compounded by a steady degradation of the shoreline environment. The estuaries essential to the great majority of marine finfish species have been reshaped and polluted, and the effects of this can in many cases only be surmised. The loss of once valuable resources of anadramous fish such as alewives, smelt and salmon, and nearshore mollusks such as oysters can, however, be readily documented. In most cases they are clearly attributable to human alterations of the environment.

Figure 4 indicates the most recent examples of the rise and decline of specific fisheries. In the years after World War II, a trawler fishery for industrial fish flourished briefly. The fishery was centered in southern New England, where large volumes of red hake and whiting were taken in nearshore waters, particularly in the vicinity of Martha's Vineyard. The fish were processed into a variety of products (thus the name industrial fish), most notably high protein fish meal, an essential ingredient for agricultural feeds. The unit price for this catch was low (Figure 5), and in the early '60s U.S.-produced fish meal was undersold by meal produced in Peru. The fishery would have declined regardless of foreign imports, however, since fleets of Russian trawlers drastically reduced the stocks of these species at the same time that Peruvian imports became important. Variations in industrial landings in recent years (Figure 4) are due primarily to fluctuations in the menhaden fishery. The latest of the boom fisheries has been offshore lobster. The domestic catch was taken by trawlers during the '60s but by 1970 an offshore trap fishery was under way, and today most offshore lobster is taken with this gear. Despite great increases in effort, measured by the number of pots fished (Figure 6), regional lobster landings peaked in 1969 and have declined since then. It should be remembered that although foreign fleets did not report any lobster prior to 1971, it is known that lobster were taken and that foreign catches may have been very significant. In 1975, although they accounted for only 10.3 percent of the total landings by weight, lobster accounted for 51.9 percent of the landings by value (these figures do not include New Hampshire and Connecticut landings).

Though the constant dollar value of foodfish decreased 10.5 percent between 1950 and 1975 compared with a 243.8 percent increase for crustaceans, foodfish have maintained their position as the most important species group. We may expect their importance to increase in the future.

Figures 7 and 8 show landings by gear group. Gear classified as "other" is clearly important in terms of volume but makes the smallest contribution in terms of value. In 1972, the contribution of specific gear types to the total landings made by this group was as follows: purse seines (42.3 percent), stop seines (24.9 percent) and longlines (9.1 percent).

Trends in the landings of individual states in the region are seen in Figures 9 and 10. Only Rhode Island and New Hampshire have shown positive trends in the volume of catches and the small size of New Hampshire's fishery makes it of minor regional significance. The most solid gains have clearly been made by Rhode Island, whose landings between 1950 and 1975 have increased 200 percent in value and 97.5 percent in pounds. Maine has increased 69 percent in value but declined 61.2 percent in pounds. Massachusetts, though still the leader among the states, is down both in value and volume by 20.7 percent and 56.4 percent. Recent increases in the value of Maine landings may be attributed primarily to the rising value of lobster.

The trends in the constant dollar value of landings may be compared to the percent changes in the personal income in the five states which increased as follows during the study period: Maine 52 percent, Massachusetts 52 percent, New Hampshire 63 percent, Rhode Island 49 percent and Connecticut 60 percent.

Landings in Individual States

Maine: Maine has held second place in the region on the basis of both pounds landed and the value of landings. During the period under discussion, the volume of total landings has declined 61.2 percent while the value has increased 69 percent. The rise in value is due primarily to the increasing price for lobster. In 1975, lobster contributed 56.7 percent to the value of total Maine landings. Lobster landings by pounds have held fairly steady but only with an enormous

increase in fishing effort. There were approximately 325 percent more pots in use in 1973 than in 1955 and NMFS indicates that the yield per pot fell from 43 pounds to 11 pounds per year over that period.

Foodfish landings have shown a steady decline and were less valuable than either crustaceans or mollusks in 1975, though they remained most important in terms of volume. Ocean perch and herring are especially important among Maine foodfish. Mollusk landings sagged in the late '50s and early '60s but the trend is now upward with soft-shell clams leading. Mollusks contributed 24.2 percent of the total value of Maine landings in 1975. The industrial fishery peaked in 1954 but has been of little significance since 1960.

The high value of lobsters is again reflected in landings by gear (Figures 13 and 14). Together lobster and crab pots produced 57 percent of the value of all landings in 1972, compared with 44.8 percent in 1950. Gear classified as "other" is important in terms of volume and include stop seines (48.0 percent), pots and traps (25.1 percent) and purse seines (0.9 percent).

NMFS 1975 statistics indicate that somewhat less than 1 percent of Maine's catch in both dollars and pounds was taken in the Georges Bank area. Traditionally, Maine fishermen work inshore grounds from small vessels and boats. Larger vessels, concentrated in the ports of Rockland and Portland, venture farther afield but Georges Bank contributes only some 5 percent to their catches (see Section 2 for details) since offshore fishing in Maine usually means the Gulf of Maine and the smaller banks to the northeast of Georges.

In no other New England state are fisheries as geographically dispersed as they are in Maine. Virtually every coastal town is home to a number of fishermen, and the few ports that could be classified as "major" contribute a small percentage to the state's total landings. This is in marked contrast to more southerly states. In Massachusetts, Gloucester and New Bedford together contribute 70 percent of the state's landings and in Rhode Island, Point Judith and Newport contribute 95 percent to that state's total catch. Rockland and Portland combined accounted for only 15 percent of Maine's landings in 1975.

New Hampshire: New Hampshire fisheries have shown steady growth during the period being discussed. Crustaceans dominate and foodfish accounted for 45.7 percent of the volume and 10.6 percent of the value of landings in 1972. Fish are taken by small vessels that typically operate a variety of gear. Fish are caught primarily with longlines and gill nets on grounds that seldom include any portion of what is considered in this study as the Georges Bank area. Since 1970, trawler landings have been increasingly important. Crustacean landings are dominated by lobster, but shrimp accounted for 3 percent of the value and 18.3 percent of the volume of 1972 crustacean landings.

Massachusetts: Massachusetts has historically been the leader in the region in terms of both the volume and value of fishery products landed. Its fisheries are dominated by trawlers and by foodfish. Over the period of this study, total pounds landed have plummeted by 55.6 percent though the value of these landings has declined only 14.4 percent. With the exception of crustaceans, which peaked in the early 1970s, declining trends in dollars and pounds are seen in all species and gear groups.

The importance of individual foodfish species has changed over the years in response to drastic declines in the stocks of all the traditionally favored species. Haddock, once a dominant species, particularly for the Boston trawler fleet, began a drastic decline in the mid 1960s and as yet shows little sign of recovery. Yellowtail flounder, once the mainstay of the New Bedford fleet, has given way to other flatfish species such as dabs and gray sole since fishermen have been forced to seek substitutes. Despite drastic overfishing offshore, foodfish remain the principal species group harvested by Massachusetts fishermen and accounted for 70.4 percent of the dollars and 88.5 percent of the pounds of all species landed in 1975. The great majority of food fish are landed in a few major ports, most notably Gloucester, Boston, New Bedford and Provincetown.

The crustacean fisheries, dominated by lobster, began to increase rapidly in importance in the mid 1960s and peaked in 1972 when they accounted for 20.6 percent of

the total dollars and 6.4 percent of the total pounds landed. Despite an enormous fishing effort, landings are down since 1974. Lobsters, traditionally caught in traps, were harvested in significant numbers offshore by trawlers in the 1960s. Since the early 1970s, however, virtually all lobsters landed, both from offshore and inshore grounds, are taken in traps. The Massachusetts shrimp fishery is significant and accounted for 66.9 percent of crustacean landings by weight and 24.2 percent by value in 1975.

In 1975 mollusk landings (excluding squid) were dominated by scallops (99.9 percent). The general decline in pounds landed since 1950 may be attributed primarily to the sea scallop fishery, which however, is at present showing promising signs of revival. The constant dollar value of mollusks landed has been relatively steady since 1950.

The industrial species fishery boomed in the late 1950s when large stocks of red hake and whiting were harvested in the vicinity of Martha's Vineyard. Menhaden, the other principal industrial species, is well known for sharp variations in its abundance. Though relatively good catches were taken in 1973 and 1974, their low unit value does not compensate for the steady decline in the value of this species group, as seen in Figure 20.

The decline in foodfish landings is dramatically reflected in the unrelieved decline of trawler landings. Rising prices, however, have softened the effect and though landings in pounds fell by 65.1 percent between 1950 and 1972, the value of the trawler fishery fell by only 35.4 percent. In 1972 trawlers accounted for 86.9 percent of the dollars and 78.3 percent of the pounds of all finfish products landed in the state. Gear classified as "other" in Figures 21 and 22 has contributed significantly to Massachusetts fisheries, especially in terms of pounds. Most important among this gear are purse seines (53.9 percent), longlines (16.8 percent) and pots and traps (12.1 percent).

Massachusetts fishermen take far more fish in the Georges Bank area than fishermen from any other state. In 1975, approximately 45 to 50 percent of the total landings by weight and 60 to 65 percent by value were harvested in the Georges Bank area (see Section 2).

Rhode Island: Rhode Island is the only state in the region with a significant fishing industry that has shown a net increase in total pounds landed between 1950 and 1975. During that period, total pounds landed increased by 107.9 percent and the value of these landings by 238.2 percent. In 1975 Rhode Island accounted, by weight, for 11.9 percent of the region's foodfish, 60 percent of the industrial fish, 15.9 percent of the lobster and 12.2 percent of the mollusks excluding squid. Point Judith and Newport together accounted for some 95 percent of the state's total landings by weight in 1975.

Total landings peaked in 1957 when a booming industrial trawler fishery dominated by red hake and whiting brought the state's landings to 142.5 million pounds. Foodfish have had the edge over industrial by weight since 1972[3]. The very low value of industrial fish, however, makes them the least important species group in terms of dollars. Foodfish landings have increased in pounds by some 213.8 percent between 1950 and 1975. Since the late 1960s this may be attributed to the re-emergence of Newport as an important fishing port.

As seen elsewhere in the region, lobster landings became increasingly important through the late 1960s, first with the development of an offshore trawler fishery and thereafter of the offshore pot fishery. In 1970 only some 11 percent of all the lobsters landed in Rhode Island were taken by traps but by 1973 the new offshore pot fishery had claimed some 77 percent. In 1975, Newport landed more lobster than any other single port for which NMFS statistics are available, and 78 percent of this catch came from the Georges Bank area.

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[3]The low figure for industrial landings in 1964 does not reflect the activity of the Rhode Island fleet at that time; an out-of-state buy-boat anchored in Point Judith Harbor of Refuge bought most of the catch that year.

Mollusk landings (excluding squid) were down 33.7 percent in 1975 compared to 1950. This may be attributed to closures, due to pollution, of productive bay quahog beds in upper Narragansett Bay and a decrease in fishing effort. Mollusk landings have been bolstered since the late 1960s by a growing ocean quahog dredge fishery in Rhode Island and Block Island Sounds. Ocean quahogs command a relatively low price and in 1975 accounted for some 44 percent of the mollusk landings by weight and 14.9 percent by value.

Trawlers dominate Rhode Island fisheries both in dollars and pounds landed. In 1975, 44.8 percent of the state's total landings by value and 68.9 percent by pounds were taken by this fishery. Gear classified as "other" in the graphs are primarily purse seines used for harvesting menhaden and floating fish traps. In 1973 (Olsen and Stevenson, 1975), purse seines accounted for some 17 percent of the total pounds and 2 percent of the total value and floating fish traps for approximately 4 and 7 percent respectively. The lobster trap fishery has suffered a decline as measured in pounds since 1971 but this has been largely offset by rising prices. It is interesting to note that the catch per pot in the inshore fishery was some 85 pounds in 1921 but only 54 pounds in 1970.

As may be seen below, Newport and Point Judith together dominate as Rhode Island's fishing ports.

	Percentage of total Rhode Island landings at Point Judith & Newport
foodfish	99.0
industrial fish	43.6
crustaceans	81.4
mollusks (excluding squid)	34.8

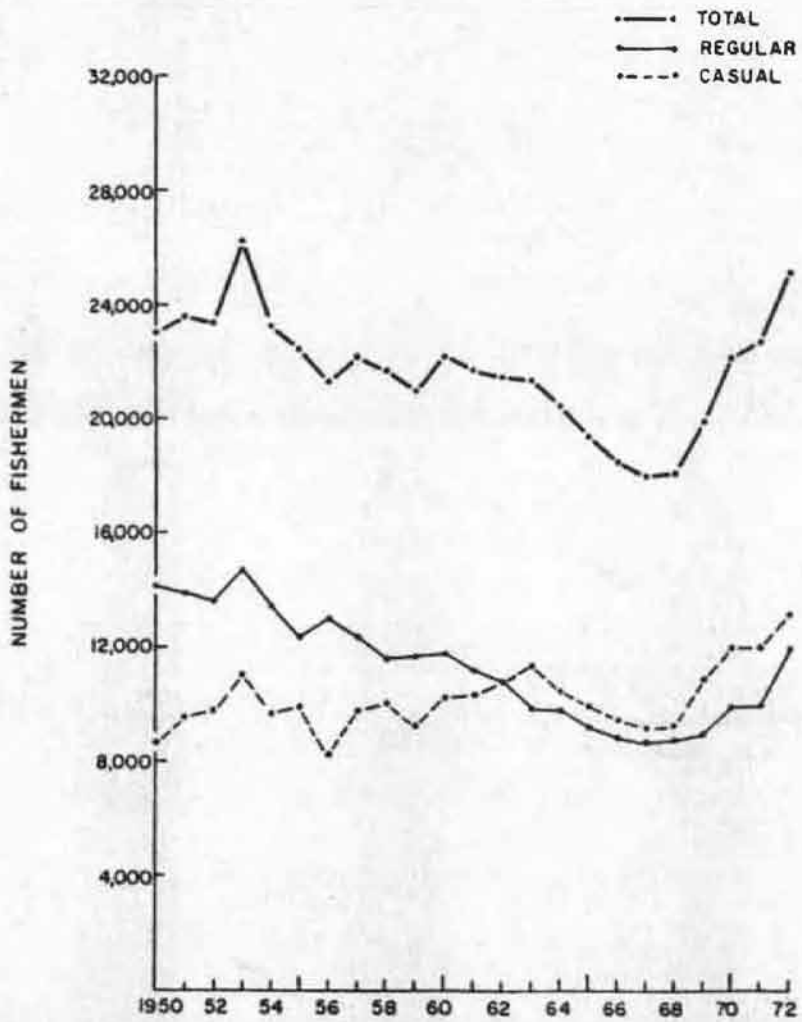
The great majority of the vessels landing at Newport, however, are from out of state and this, combined with increasing pressures to develop the port for recreational boating, makes the future of Newport landings uncertain. Point Judith, on the other hand, is well established as a flourishing fishing port and the Point

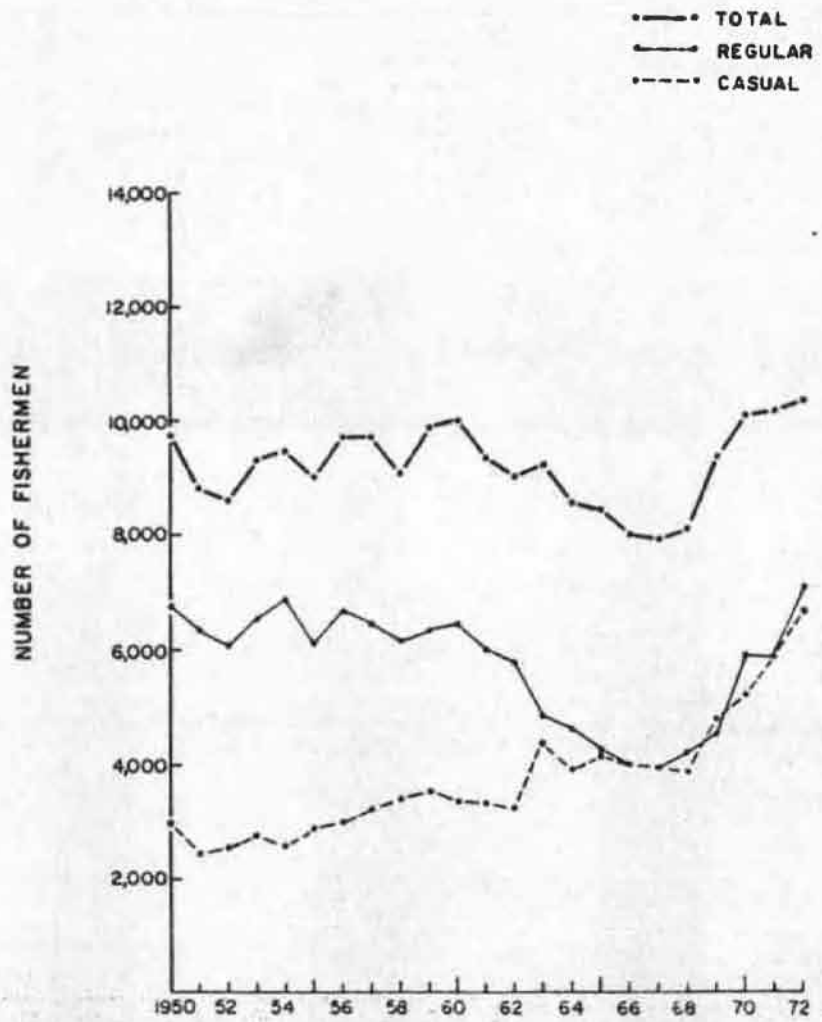
Judith Fishermen's Cooperative has long been recognized as one of New England's outstanding success stories. In 1975, 18 percent of the landings at the two ports by weight and 44 percent by value were taken in the Georges Bank area. It is noteworthy that 57 percent of the crustaceans landed were harvested on or near Georges. Point Judith fishermen, however, are more dependent on nearshore grounds than fishermen landings in Newport. In 1975, 8 percent of the value and 3 percent of the volume of Point Judith landings came from the Georges Bank area, whereas for Newport the percentages were 70 and 62 percent respectively.

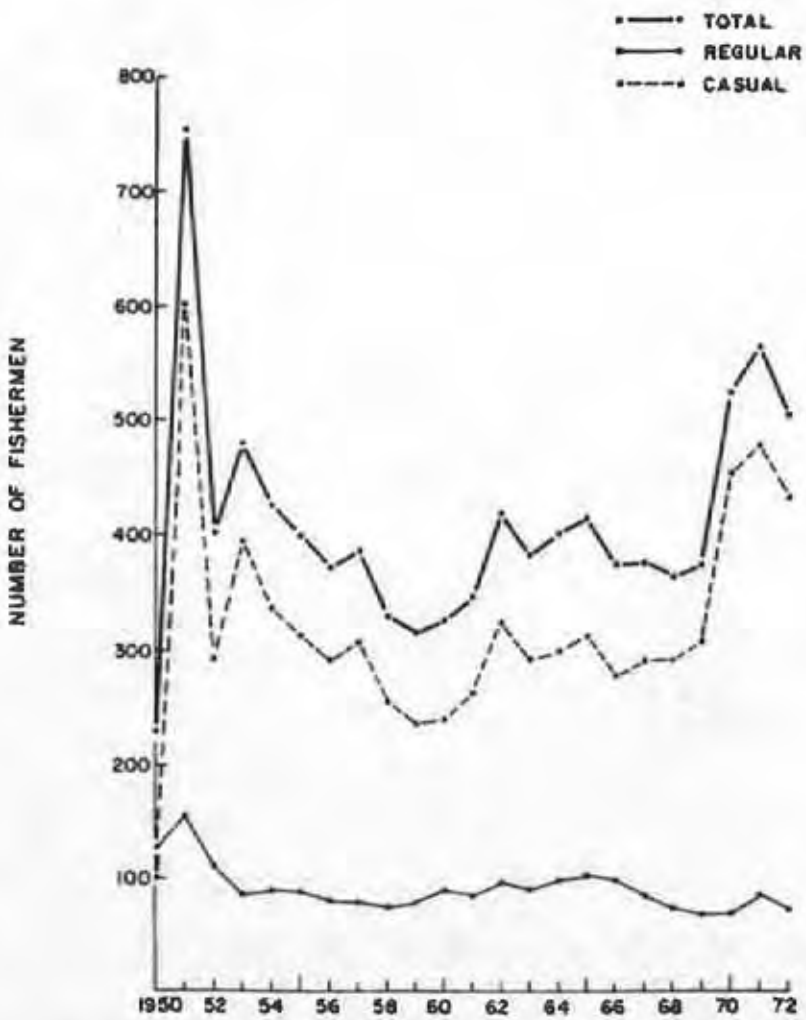
Connecticut: Detailed NMFS statistics are available only through 1972, a year that appears to have been an all-time low for Connecticut fisheries. In 1975 Connecticut accounted for 1.5 percent of the region's landings by weight and 2.2 percent by value. Connecticut landings that year were down 64 percent by weight compared with 1950. The value of Connecticut landings has shown wide fluctuation in the past 25 years and was up from 1950 only 23.8 percent in 1975. As in Rhode Island, the industrial trawler fishery was important in terms of pounds in the 1950s but never very significant in value. Unlike Rhode Island, where foodfish landings have gradually increased over the years, Connecticut foodfish fisheries show a steady decline through 1972. In subsequent years, however, there is evidence that the trend has changed, due to somewhat more activity at Stonington. As elsewhere in the region, crustacean landings became increasingly important through the 1960s and peaked in the early 1970s. The very high value of lobsters made this group more valuable than any other after 1973. Mollusks are still important to the value of Connecticut landings, though the pounds harvested show a discouraging downward trend. The value of this species group is still dominated by oysters, though this fishery is a shadow of what it was many decades ago.

Trawlers have dominated other gear groups in terms of the weight of landings since 1950. This high value lobster fishery, however, has held first place as the most valuable fishery since 1968. In 1972, shellfisheries, in second place, accounted for 28.9 percent

of the total landings by value. Important among "other" gear are gillnets (45.7 percent) and pots and traps (41.2 percent). Connecticut trawlers are generally small and fish nearshore grounds in Long Island and Block Island Sounds. The only significant trawler port is Stonington and vessels in its fleet have in the past frequently landed their catches at other ports, most notably Point Judith, Rhode Island, and Greenport, Long Island. Data are not available for the geographic distribution of the sources of Connecticut landings in 1975. It may be assumed, however, that no, or insignificant amounts of fish were taken in the Georges Bank area.


TOTAL
REGULAR
CASUAL
NUMBER OF FISHERMEN
32,000
28,000
24,000
20,000
16,000
12,000
8,000
4,000
1950 52 54 56 58 60 62 64 66 68 70 72


TOTAL
REGULAR
CASUAL
NUMBER OF FISHERMEN
14,000
12,000
10,000
8,000
6,000
4,000
2,000
1950 52 54 56 58 60 62 64 66 68 70 72


TOTAL
REGULAR
CASUAL
NUMBER OF FISHERMEN
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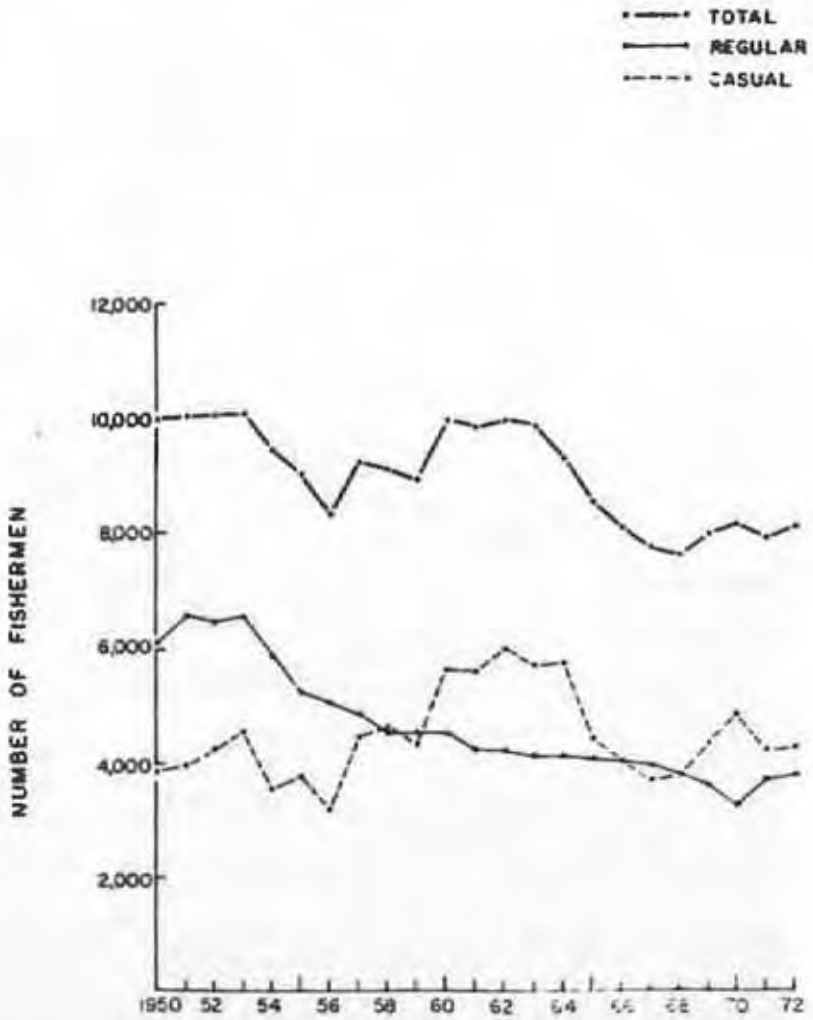
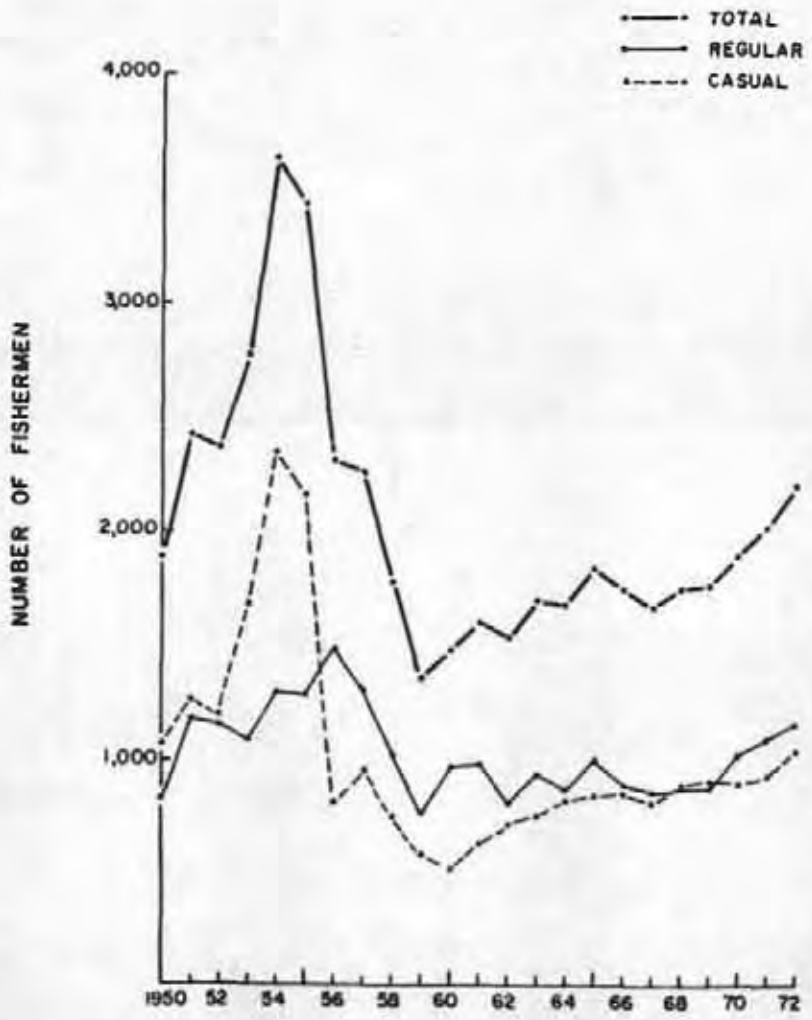
700
600
500
400
300
200
100
1950 52 54 56 58 60 62 64 66 68 70 72


TOTAL
REGULAR
CASUAL
NUMBER OF FISHERMEN
12,000
10,000
8,000
6,000
4,000
2,000
1950 52 54 56 58 60 62 64 70 72


TOTAL
REGULAR
CASUAL
NUMBER OF FISHERMEN
4,000
3,000
2,000
1,000
1950 52 54 56 58 60 62 64 66 68 70 72

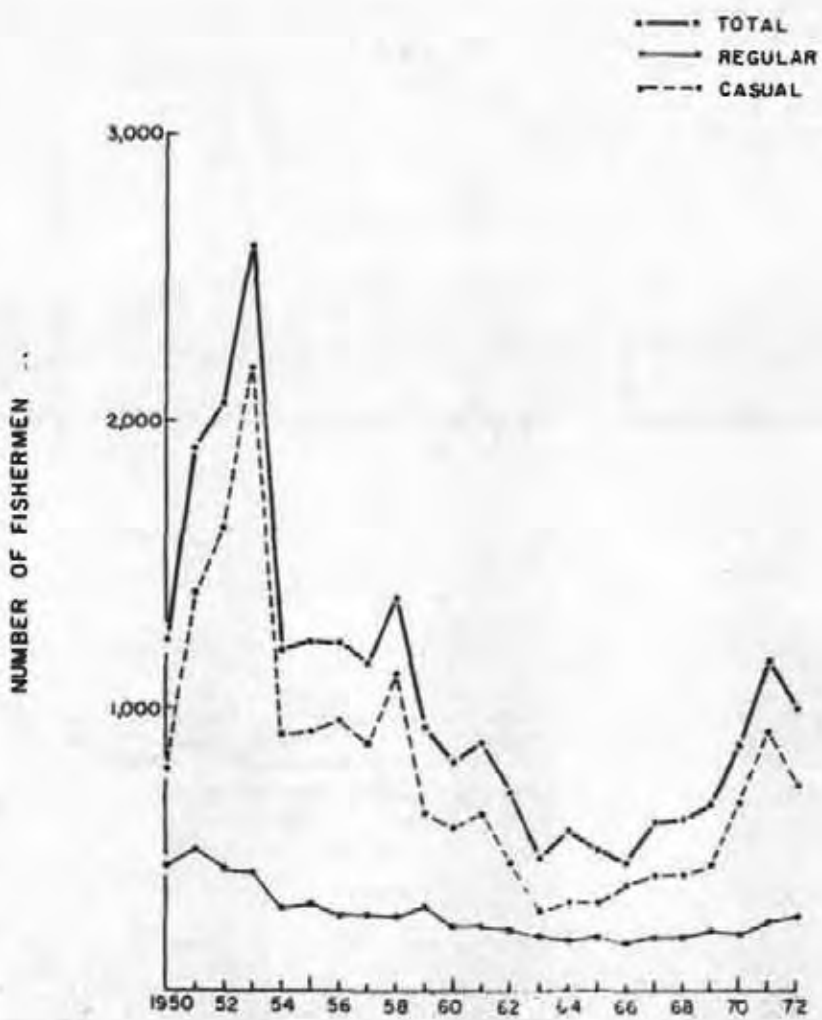

TOTAL
REGULAR
CASUAL
NUMBER OF FISHERMEN
3,000
2,000
1,000
1950 52 54 56 58 60 62 64 66 68 70 72

Fig. 1. New England Landings

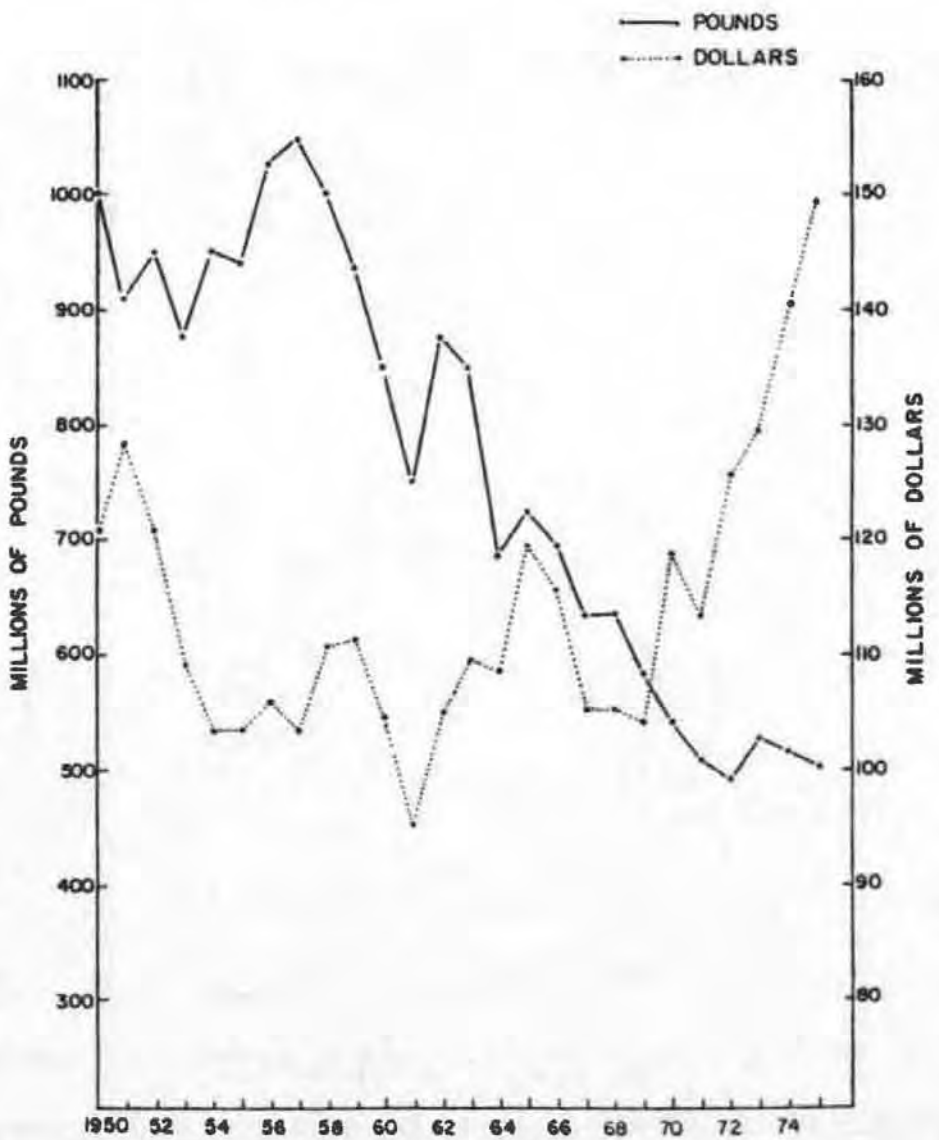


Fig. 2. U.S. vs. Foreign Landings [illegible]
ICNAF Areas 5 and 6

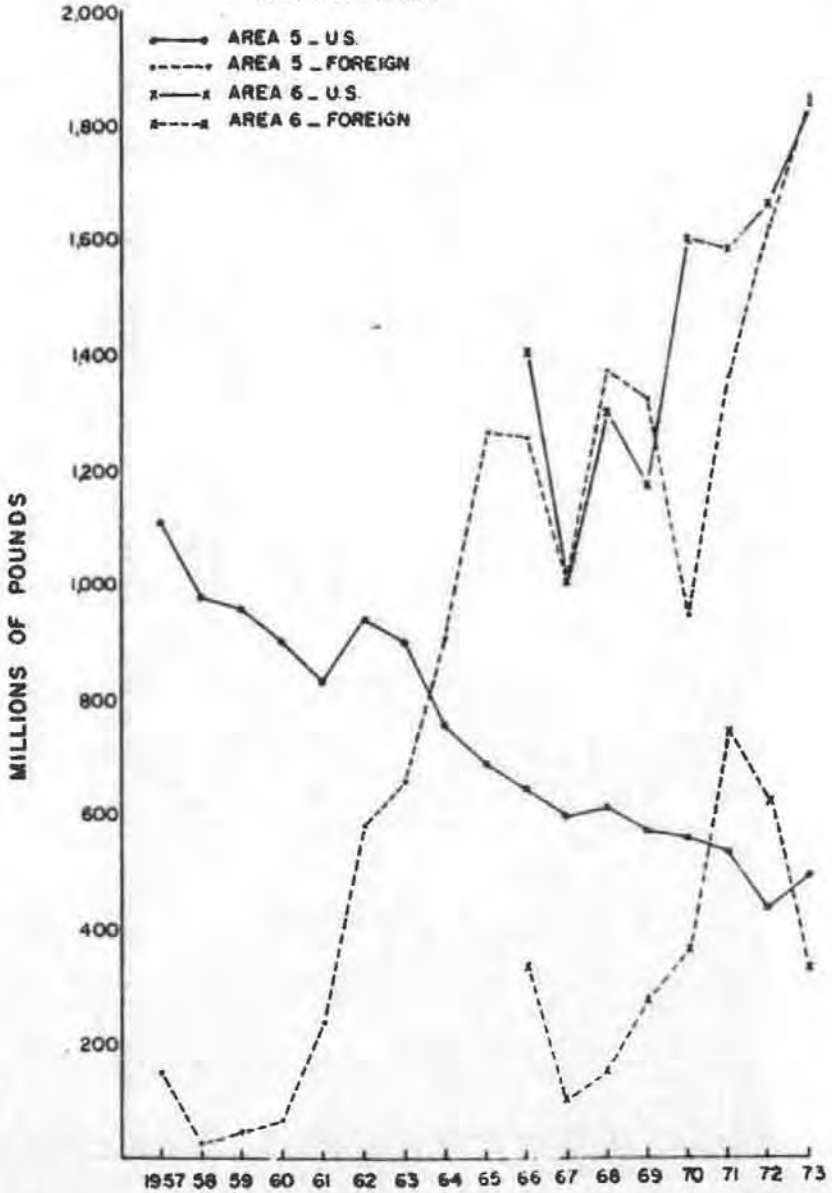
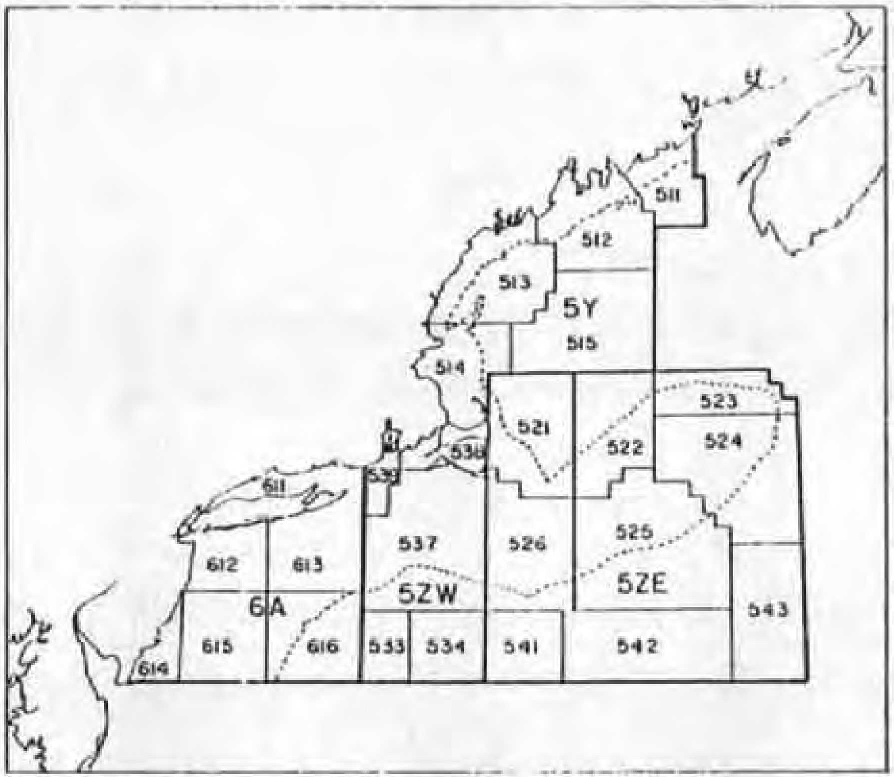


Fig. 3. ... Areas 5 ... and ICNAF Areas 5 and 6A



Note: ICNAF areas are those large areas outlined with heavy lines.

Fig. 4. New England Landings by Species Group ...