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The Fishing Ports of Maine and New Hampshire: 1978, Report to the National Science Foundation, Volume I

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**Maine Sea Grant
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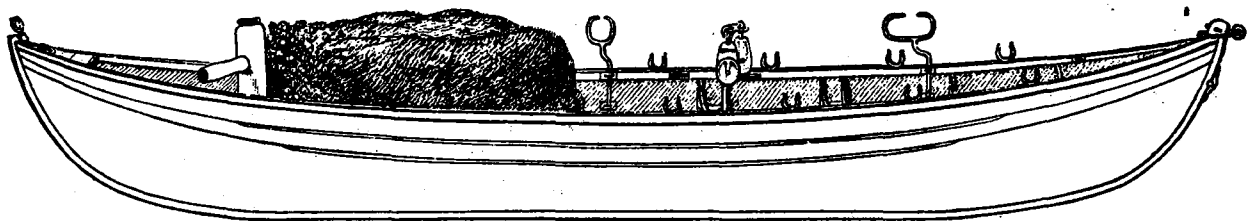
The Fishing Ports of Maine and New Hampshire: 1978

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PREFACE

This volume is part of a final report on social science aspects of fisheries management in New England, and is based on results of a project entitled "University of Rhode Island, University of Maine Study of the Social and Cultural Aspects of Fisheries Management In New England Under Extended Jurisdiction." The study was sponsored by a grant from the National Science Foundation (Grant Number: "DAR-7706018"); all told, the final report on this project comprises three volumes, of which this is the first. As the name of the project suggests, the data on which these volumes are based were gathered by two teams of social scientists: one from the University of Maine and the other from the University of Rhode Island. The University of Rhode Island crew gathered information in Massachusetts and Rhode Island and the University of Maine crew covered Maine and New Hampshire.

This project was primarily anthropological in nature. All five people who worked on the project from the University of Rhode Island were anthropologists. Of the seven people who worked on the project at any time from the University of Maine, four were anthropologists, two were economists, and one was a graduate student in biology. (The latter was employed only for a very short period, however.) The object of the project was to gain an understanding of the people involved in the fishing industry--their culture, problems, and perspective. Information on the biology of the fish was included only when it had some bearing on the behavior of the people.

One of the five objectives of this project was to obtain information on the ports of New England. The information gathered on the ports of Maine and New Hampshire is reported in this volume. Descriptions of Massachusetts and Rhode Island ports produced by this project are published as a separate volume by the University of Rhode Island Sea Grant program, and is authored by John Poggie and Richard Pollnac of the Department of Anthropology of the University of Rhode Island.

This volume and its counterpart, written by Drs. Poggie and Pollnac, contain only baseline data. The objective of this part of the project was to compile basic information on such matters as: the numbers of men fishing, the types of boats in use, the species sought over the annual round, port infrastructure, ethnic composition, marketing facilities, and comparable matters. No theoretical perspective is presented nor is any argument made here. The object was simply to record, as accurately as possible, basic data about each port and the fisheries of the area.

This volume is divided into three sections. In Section I, general background information is given concerning aspects of the fisheries in northern New England. Chapter 1 of this section focuses on the history of fishing in the area, while Chapter 2 gives general information on the coastal environment and on the biology of major species caught. Chapter 3 gives a background on fishing boats and gear, marketing and processing, and the legal environment.

In Section II, we describe each of the ports in Maine and New Hampshire, as they were in the baseline year of 1978, outlining the physical setting and population, the major industries, general infrastructure, and port infrastructure. We then describe the major fishing activities in each port, giving information on the number of boats and men involved, marketing arrangements, and processing facilities, fishery by fishery. There are a total of 71 port descriptions, most of which cover only one harbor. However, in a few instances two or more adjacent harbors in one township are covered under the same description. In some cases, this is explicit in the title (for example, Port Clyde-Tenants Harbor), but in other cases several smaller harbors may be included under one heading (for example, East Boothbay is covered under the general township heading of "Boothbay"). (An alphabetical list of all port place names mentioned in the volume is provided in the Index.) The general order of presentation is from east to west, beginning with the easternmost port--Eastport, Maine--and moving to the most western--Hampton Beach-Seabrook Beach, New Hampshire. (A map of these ports is provided at the end of the volume. See Figure 4.)

Section III describes the local variations in the fishing industry of northern New England. This is done, in the main, by presenting a statistical summary of the information contained in the port descriptions. For each county, we have information on numbers of boats and men in each fishery, marketing and processing facilities, types of fishing gear used over the annual round, indicators

of urbanization, etc. This information demonstrates that the coast is best regarded as a continuum whose western region is different geographically, ecologically, socially, and economically from the central and eastern parts of Maine. In some cases, one can use the figures presented in Section III to generalize about fisheries in Maine and New Hampshire as a whole; in other cases, one cannot. Virtually all of the lobster boats, pair trawlers, gillnetters, and draggers are moored in the ports we studied and our interviewers obtained accurate accounts of them. However, a large number of clambers and wormers live in inland towns and commute to various parts of the coast. We got no accurate count of these fishermen who do not live in the ports studied. Thus, our figures on fisheries involving boats are accurate indices of total numbers in the states involved; the same is not true for clamming and worming.

The data in this volume were collected with the idea that they would be useful for a variety of different kinds of studies. First, some of the data will be useful in models designed to assess economic impacts. Data on numbers of boats, men, and industries are useful, for example, in attempting to assess how many jobs and families might be affected in any given region by changes affecting one or another segment of the fishing industry. Second, the information on transportation facilities, port infrastructure, and population provide background of use to agencies interested in regional planning and to social scientists interested in problems of locational analysis. Third, we collected data which we felt would be useful to those in the industry and government concerned with the management of the marine fisheries of northern New England. For those interested in promulgating regulations, it is essential to have information on numbers of boats and men involved in each type of fishery, their location, and their activities over the annual round, as well as information on marketing outlets and alternate jobs available in the area. This kind of information, while elementary, has not been published for the ports of New England in the last several decades. Fourth, this information hopefully will give some standard for assessing the changes that are taking place in the fishing industry at present. The Fisheries Conservation and Management Act of 1976--the so-called "200-Mile Limit"--will undoubtedly produce great changes in the New England fishing scene. In the future, we can expect that all kinds of assertions will be made--positive and negative--concerning the effect of this legislation on the fishing industry. In the absence of accurate baseline data, managers, politicians, and industry representatives may have nothing to rely on other than the vague recollections of interested parties. A picture of New England fishing communities before regulation took place should therefore be of considerable interest to those concerned with management, particularly when possible alterations in fisheries regulations are being considered or when the impact of regulations are being assessed.

All told, we attempted to include in the study basic information which could be mined in the future by a variety of types of people for several different purposes.

Fifth, we collected these data because they would be useful for our own purposes in completing our own study. Indeed this information has been useful in a variety of other articles (see Acheson and Lazarowitz 1980; Lazarowitz and Acheson 1980; Acheson, J. 1980; Acheson, A. 1980; Anonymous 1980).

The data on which this volume is based were collected during the summer and fall of 1978 by three members of our research team from the University of Maine. Most of the information on the ports themselves was collected while members of the research team were administering a very lengthy questionnaire to a large sample of groundfishermen and herring fishermen along the entire coast. One cannot obtain one to four hour interviews with five or six men from a particular harbor without finding out a great deal of general information about the harbor they fish from. Additional information on many harbors was obtained and checked by using key informants familiar with the fishing scene in the area. All of the harbors in Maine and New Hampshire were visited and observed by at least two members of the research team for a minimum of half a day. Most harbors were visited for several man-days. There is one notable exception: we did not have a chance to visit seven inhabited islands in Penobscot Bay and Casco Bay. Information on these islands was obtained during visits which took place previous to this current study and by interviewing key informants on the mainland or over the phone.

The data contained in these port studies are complete with one notable exception. During the course of the project, eight individuals either refused to be interviewed or said they did not want to be mentioned after they had been interviewed. We simply left these individuals and their boats or firms out of both the port descriptions themselves and the statistical summary.

Dr. John Bort collected and wrote up the data on Eastport, Lubec, Cutler, Milbridge-Steuben, Corea, Prospect Harbor, Winter Harbor, the harbors on Mt. Desert Island, Stonington, South Bristol, Small Point, the harbors in the town of Harpswell, Kennebunk, and Cape Porpoise. Jayne Lello collected the data and did the first draft of the reports on Yarmouth, Falmouth Foreside, Portland, Cape Elizabeth, and Pine Point. James Acheson collected the data and wrote the draft of the information on the other 48 ports. During the spring of 1979, James Acheson visited every port in the two-state area to obtain information that had been missed in the first phase of the interviewing. He added this information to the draft of the volume and edited all the descriptions of the ports. During June and July of 1979, the draft of the information on the ports themselves was typed by Linda Joy Novak. In the fall of 1979, sections of this typed and edited version of the study were then distributed to 30 people along the coast for their commentary.

These 30 people were asked to comment extensively on the descriptions of one to seven ports with which they were familiar.* These comments were then incorporated into the final draft by James Acheson. The introduction and conclusions were written by Ann Acheson, who also compiled all the tables, and edited and proofread the final draft. The manuscript was typed in final form by Julie Mowatt of Orono, Maine, and corrected by Justine Shea, also of Orono. Final editorial changes were made by Phyllis Coggins and Martha Barend of the University of Maine Sea Grant Staff.

* Special thanks are due to the following people who read and commented on draft sections of this volume:

| | |
|----------------------|--|
| Maynard Morrison | Perry, Maine |
| Robert Cates | Cutler, Maine |
| Isaac Beals | Beals Island, Maine |
| Al Jordan | Milbridge, Maine |
| "Kannan" Kunhikannan | Milbridge, Maine and Stoneybrook, New York |
| Elmer Beal | Southwest Harbor, Maine |
| Timothy Staples | Swans Island, Maine |
| Robin Alden Peters | Blue Hill, Maine |
| Mary Ann Bates | Brooksville, Maine |
| George Putz | Vinalhaven, Maine |
| Mike Brown | Lincolnville, Maine |
| Frank Bowles | Matinicus, Maine |
| Eugene Witham | Owls Head, Maine |
| Karl Illvonen | South Thomaston, Maine |
| Bertram Witham | Tenants Harbor, Maine |
| Doug Anderson | Port Clyde, Maine |
| Philip Davis | Pleasant Point, Maine |
| Maynard Winchenbach | Friendship, Maine |
| Ted Palino | Bremen, Maine |
| Edgar Drisko | New Harbor, Maine |
| Fred Boynton | New Harbor, Maine |
| Dan Cheney | Pemaquid, Maine |
| Ivan Flye | Newcastle, Maine |
| Charles Begin | Boothbay Harbor, Maine |
| Arthur Cocheran | Five Islands, Maine |
| Jan White | Bath, Maine |
| Bob Green | Bailey Island, Maine |
| Mary Ann Bradford | Cumberland Foreside, Maine |
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The fishing industry is in a period of rapid change at present. Boats are bought and sold and firms are constantly going into and out of business. If one is going to describe the fishing industry of northern New England, one has to do it for a particular time. We have chosen to describe the industry as it existed in the fall of 1978. What we have to say holds true only for this period. We are under no illusion that our descriptions will remain current very long. It is our hope that this port volume will be useful to those who want an up-to-date picture of the fishing industry of northern New England for the next five years. In 10 years, most of the information is likely to be very dated and of historic value only.

Again, the object of this volume is to present baseline data. In this regard, Mark Twain's warning should be taken to heart:

"Notice

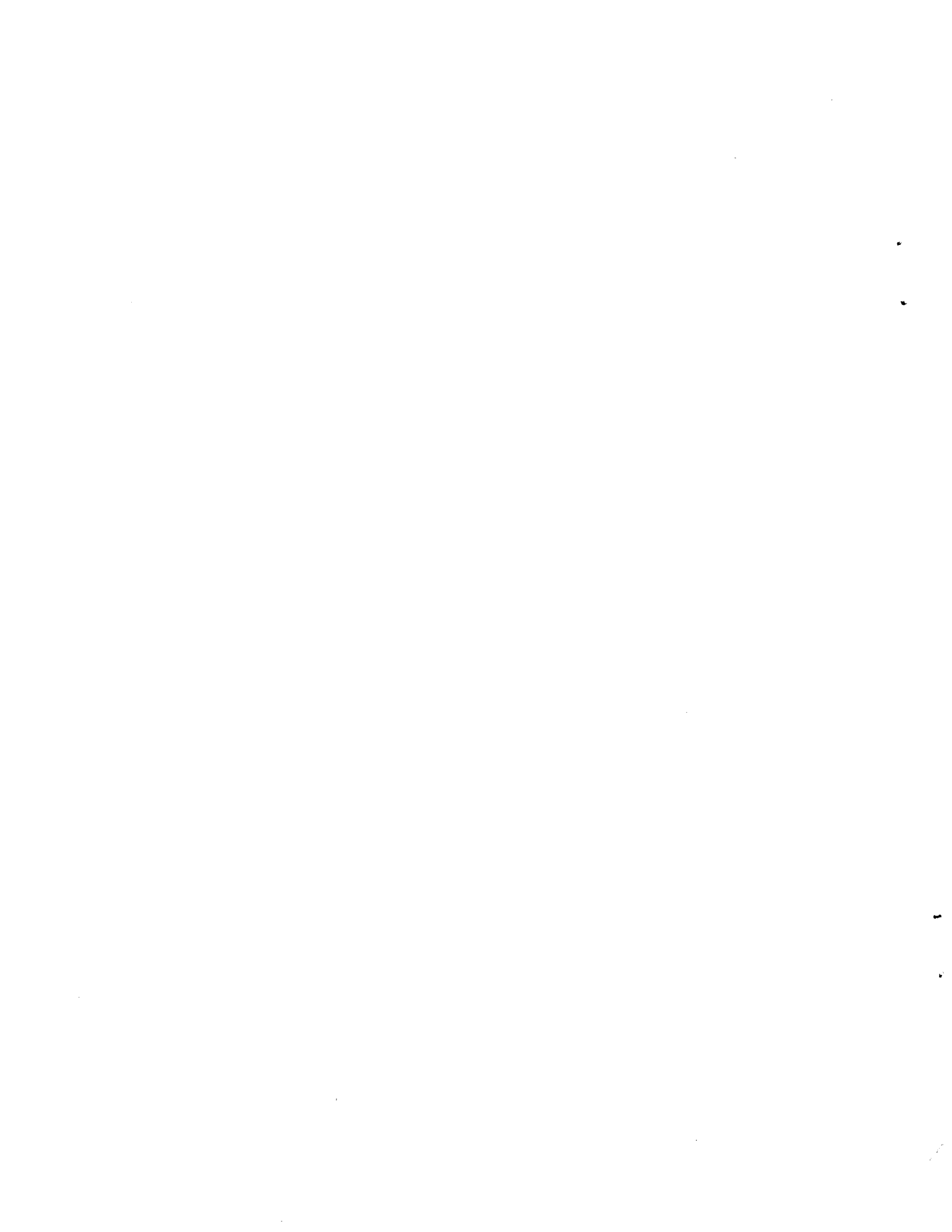
Persons attempting to find a motive in this narrative will be prosecuted;
persons attempting to find a moral in it will be banished; persons attempting
to find a plot in it will be shot."



Jim Acheson (left) on board a lobster boat.

SECTION I

INTRODUCTION



CHAPTER 1

Historical Overview of the Northern New England Fishing Industry

Fishing was the New World's earliest industry, and what is present-day northern New England was an early leader in that industry. To be sure, fishing the Grand Banks near Newfoundland had become a well-established industry as early as the 15th century and possibly earlier. However, the New England fisheries quickly expanded in prominence, until by the latter part of the 17th century, fishing dwarfed all other industries in importance. In the early 17th century, only inshore stocks of fish were exploited by Maine and New Hampshire settlers, who used relatively small "shallops," usually with a four man crew. The primary commercial species was cod, which was salted and exported to France, Spain, the Caribbean and elsewhere as early as 1650 (McFarland 1911:69). In the latter part of the 17th century, New Englanders began building much larger vessels which stayed out for much longer periods and began to exploit the Grand Banks waters off Newfoundland and Labrador.

During the 18th century, Massachusetts took a commanding lead in New England's fishing industry; its population was by then denser and its boats larger and more numerous than that of Maine and New Hampshire. For example, in 1765-1775 of 665 New England codfishing vessels, only 60 were from Maine (McFarland 1911:112).

The period between the American Revolution and the War of 1812 was a bad one for New England's fishing industry. A great deal of capital equipment had deteriorated or been destroyed, and marketing suffered because of a British law prohibiting importation of U. S. fish. To try to alleviate the poor conditions of the industry the U. S. Congress in 1792 passed a bounty law whereby shipowners received graduated payments, depending on the tonnage of the vessel. The Maine fishing industry grew relatively rapidly in response to this bounty system, and many former fishing hamlets became full-fledged towns (McFarland 1911:136; 143-146).

During the 19th century, the period between the close of the War of 1812 and the Civil War were perhaps the most prosperous years for New England's fisheries (Acheson et al. 1978:20). There was a big expansion in fleet size, catch size, and numbers of different species exploited. The Federal "bounty" continued and was raised in 1818, remaining in effect until 1866 (McFarland 1911:162-164). Fish harvesting and processing technologies grew rapidly. And the market value of fish was very good. Cod continued to be the mainstay of the New England fishery, but after 1818 the mackerel, herring, and menhaden fisheries expanded rapidly. Fish were caught from sail-powered boats by men using handlines from the boat itself, or in traditional fixed gear operations, in the case of herring (first brush weirs, and later stop seines). Considering the technology used, catches were extremely high (McFarland 1911:171).

Maine and New Hampshire lagged behind Massachusetts in the use of large boats capable of exploiting the Grand Banks and other distant areas. Only during the 1830's did much larger (10 to 20 ton) vessels begin to be constructed in Maine, while 40 to 80 ton square stern schooners became the standard long-distance boats in the 1850's (Acheson et al. 1978:22). Perhaps the most important changes in the decades preceeding the Civil War were those which led to the eventual diversification and expansion of New England's fishing industry (ibid.).

Major technical changes in harvesting included: the use of line trawls (generally baited with clams or small herring), which began around 1850 (Green 1906:367); the catching of cod from dories rather than from the main vessel (a technique so efficient it was used by the Portuguese until the 1960's); and the use of purse seines (used first for mackerel and menhaden in the mid 1860's, and much later for herring) (Acheson et al. 1978:24).

Processing also underwent important changes. While salting continued on a large scale, fishing products began to be marketed in a variety of ways. Smoking and pickling of herring had begun in the eastern part of Maine (especially Eastport and Lubec) as early as the 1820's and 1830's. The canning of lobster began in Eastport in 1843 (McFarland 1911:178). According to Goode (1887, Vol. III:17), "the first can of hermetically sealed goods" put up in the United States was produced in Eastport, the process having been introduced from France via Halifax, Nova Scotia. A

technique for extracting oil from menhaden was developed in 1850, and by the time of the Civil War the first steam menhaden oil factory in Maine was built (Green 1906:371).

The Civil War and years immediately following marked a peak in the New England fishing industry. The war brought favorable prices, and catches were up. However, from the decades after the Civil War until World War I, fisheries underwent a decline, even though important innovations continued to be made. Part of the reason for this decline was a decrease in landings of several major stocks, especially menhaden, mackerel, and cod. Menhaden, especially, underwent massive fluctuations in local availability. After being found in abundance in New England waters in 1864, 1865, and 1866, they all but vanished by the early 1870's. The groundfishery (especially cod, haddock, hake, and pollack) continued to have fairly high catch levels, but by 1885 a real decline set in (Acheson et al. 1978:26). Mackerel showed an even more precipitous drop. From 1885 to 1886, the catch dropped 75%, and continued to decline (though at a slower rate) in subsequent years (McFarland 1911:264).

The lobster industry became well-established during this period, stimulated at first by the rapidly expanding canning business. The canneries took any size lobsters, and there began to be "a noticeable scarcity of lobsters" (McFarland 1911:232). To try to rectify this situation, Maine passed a law in 1879 which prohibited lobster canning from August 1st to May 1st, following; in 1883 it was made illegal to can lobsters under nine inches long; and in 1885, 1889, 1891, and 1895 there were further laws regulating lobster canning seasons and minimum sizes. These various regulations led to a decline in the lobster canning industry by the 1880's and in 1895 the last remaining factory closed (ibid). The fresh lobster market, on the other hand, continued strong. "Lobster smacks" were used as early as the 1840's but after the Civil War there was a great increase in numbers. These vessels had regular routes between points along the Maine and New Hampshire coast and the Boston, New York, and Philadelphia markets (Acheson et al. 1978:28).

The canning of herring (as "sardines") became an important industry in Maine in the 1880's, especially in Washington County. The herring catch, then as now, showed considerable fluctuations, though the market was strong and innovations in canning and processing continued to be made.

Clams had been used extensively for bait, and canning opened up a new market. The harvest of soft-shelled clams from New England continued to rise in both volume and value during the late 1800's. However, by 1905 the volume was way down, though prices remained strong (McFarland 1911:246).

Innovations continued in the harvesting and transporting of fish. The use of dories and line trawls had become universal by the 1870's. Crushed ice was used on board vessels to preserve fish. Steamers began to be used for more rapid fish transport, apparently used first in the menhaden industry in the 1860's. By 1900, some larger fishing vessels began to carry auxiliary gas engines, though sail continued to be important up through World War I and even later. Perhaps the most important innovation in harvesting was the otter trawl. However, though this was introduced as early as 1905, it did not really become widely distributed until 1920 (Ackerman 1941:79)

From the time of World War I until the present, the pace of change in the New England fisheries has accelerated. The decline in stocks of certain popular species has also accelerated. This decline has been counterbalanced to some degree by innovations which allowed the profitable exploitation and marketing of other species. Otter trawls, introduced in New England in 1905, became widely used by 1920, and made possible an increased catch of various flatfish species, haddock, and redfish. By 1935, 80% of all New England groundfish were caught by otter trawls (Ackerman 1941:78-79). The invention of the filleting machine and refinement in quick-freezing techniques in the early 1930's were further developments which increased the attractiveness of exploiting species such as redfish, flatfish, and haddock.

The use of gas and diesel engines in boats increased greatly in the period between the World Wars, along with the use of steel boat construction. However, the fin-fishing fleet of New England as a whole, and especially of the northern regions, was very heterogeneous at this time; dories and hand lines continued to be used alongside new \$300,000 steel-hulled trawlers (Ackerman 1941:71, Acheson et al. 1978:34). In the 1920's and 1930's, some lobstering was still done from rowing skiffs, but virtually all larger lobster boats were powered by converted auto engines; many were equipped with trap-pulling winches, often made from the rear end of an automobile (Acheson et al. 1978:34).

The 1940's and 1950's was a period of improved catches in many of New England's fisheries. There were also continuing changes in boats and gear. Although the catch of some groundfish species continued to decline, catches of mackerel, redfish, whiting (silver hake) and flatfish all increased. Shrimp, which appear in northern New England waters from time to time (perhaps on a cyclical basis) were caught in large numbers in the mid 1940's. They were again caught in large quantities in the late 1960's and early 1970's, only to decline again in the late 1970's. Lobster catches, which had declined drastically during the 1930's, improved markedly; for example, in 1942 the reported catch in Maine was only 8.5 million pounds, but in 1950 it was up to 19 million (Hebert 1951). As lobster catches improved, older boats were replaced and additional equipment was introduced. By the late 1950's, marine engines, cabins, and hydraulic trap haulers had become standard (Acheson et al. 1978:40). The latter were especially significant because they allowed an individual fisherman to handle many more traps. Increased lobster catches during the 1950's may have been due to increased use of pot haulers, water temperatures favorable to lobster production, and increased numbers of fishermen in the post-war period. During this same period, fin-fishing boats began to add many kinds of electronic gear, including radios, depth finders, various plotters, etc. Recently, even lobster fisherman have found it worthwhile to add certain kinds of electronic devices. For the experienced fin-fisherman, use of electronic gear has led to increased efficiency with a corresponding increase in pressure on fish stocks.

From the early 1960's until the adoption of P194-265 in 1977 (the Fisheries Conservation and Management Act) competition from large, modern, heavily-subsidized foreign vessels was a dominant factor affecting New England's fin-fisheries. Although these foreign vessels did not fish inshore stocks, inshore stocks were affected by pressure on the offshore ones. During the 1960's and 1970's, the northern New England fleet generally consisted of boats too small or too old to compete offshore; the concentration of vessels in the inshore areas was yet another factor contributing to the pressure on inshore stocks. Price competition from subsidized, imported fish has also affected New England fin-fish landings. From 1965 to 1970, the U. S. portion of the offshore northwest Atlantic catch dropped from 98 percent to 32 percent (Maguire 1978:5-6). With increased importation of "foreign" fish, Maine's share of the market has dropped. In the 1950's, some 20 percent of total landings in the United States came from New England; in 1960 it was 15 percent, and by 1970 down to a little over 10 percent. Of this New England volume, in 1970 Maine's share was about 30 percent (Maguire 1978:6-7). Compounding the decline is the fact that Maine's fin-fish species mix has been relatively limited, and weighted toward lower value varieties such as herring, menhaden, redfish (ocean perch), alewives, hake, pollock, and whiting. (Maguire [1978:7] reports that these several species accounted for 90 percent of Maine fish landings and some 75 percent of the dollar value.) In New Hampshire, the fin-fish species mix is even more limited, and consists mainly of groundfish.

Of course, lobster continues to dominate northern New England's fisheries in value. In Maine, for example, lobster in 1977 accounted for 10 percent of total landings by weight, but 51.7 percent in total value. However, pressure on the lobster may be reaching a critical point. In spite of favorable water temperatures and vastly increased effort, catches have held about steady. There is no question that fishing costs have risen dramatically, even though total real income may have held constant or increased, since the price per pound for lobster doubled in the period from 1967 to 1977.

Clams and marine worms have also come under harvesting pressure in the 1970's. The clam harvest overall rose during the late 1960's and the 1970's; Maine landings in 1977 were the highest since the post-war landings of 1946-47. However, the Maine Department of Marine Resources reports that "most areas are reaching the end of their accumulated reserves." They predict a sharp decline comparable to those following peak harvests in the 1930's and 1940's (Maine Commercial Fisheries, July 1978, Vol. 5, no. 11-B;p10). Aside from natural causes and human-caused pollution, the high price for clams has had important effects on stocks, as fishermen have begun to dig and re-dig areas which might have been left to "recover" if clam prices were not so high. A similar situation appears to be prevailing in the marine worm fishery. Attempts to change existing worm legislation to improve stock size and quality have met with opposition from most diggers, however.

The herring fishery in 1979 enjoyed one of its best years in recent times. The catch of juveniles in traditional fixed-gear operations (weirs and stop seines) was high, and purse seiners were also bringing in large catches. The continued expansion of European markets for herring fillets led to greater activity and higher catches for purse seiners and pair trawlers which pursued adult fish. The move toward catching increased amounts of adult herring has led to a longer herring

season and to an increase in fishing area ranges for pair trawlers and some of the purse seiners. Opportunities in the European market have also led to the increased adoption of automatic filleting machines (e.g. the Baader) by some processing plants.

Inshore scalloping during the 1970's drew increasing numbers of fishermen, especially some lobstermen who have begun to shift into other fisheries during the slack spring lobstering season. However, the increase may be short lived. Beds in many areas are becoming depleted, and catches have declined since 1975. However, prices continue to be very high.



CHAPTER 2

Environmental and Biological Background

Coastal Environment

The coastline north of Cape Cod trends in a generally northeast to southwest configuration. Bays and coves between numerous peninsulas, generally oriented north to south, provide good protection and anchorages from open ocean. Indeed, the coastline of the area is highly convoluted. The shortest distance between extremities on the coast of Maine is only about 225 miles, but the coastline itself is some 2500 miles long. The coastline is not uniform by any means.

The shoreline west of the mouth of Maine's Kennebec River is marked by marshes and low, grassy islands. To the east, the shore becomes much more rugged, with marked cliffs and many rocky headlands. There are almost no sand beaches east of the Kennebec River, but the areas between headlands in some spots contain extensive mudflats. By way of contrast, the stretch from about Cape Elizabeth, Maine west to Massachusetts is much less convoluted and contains many white sand beach areas, interspersed with a few rocky peninsulas. These beaches are up to 200 yards wide; and as long as five miles long in the Old Orchard Beach, Maine area. Harbors and anchorages are much fewer, poorer, and less-protected in New Hampshire and in Maine's west coastal areas than they are in the mid and east coast of Maine. The coast of this area, especially that of mid and eastern Maine, contains numerous islands--about 1300 for all of the state. (The largest, about 108 square miles, is Mt. Desert.)

Numerous rivers play an important part in the fisheries of this region. The massive flow of fresh-water has a major effect on salinity, water temperature and circulation of waters in the Gulf of Maine. Between Cape Cod and Passamaquoddy Bay, rivers deliver about 58 cubic kilometers of fresh-water yearly into the Gulf of Maine, which amounts to 61 percent of the total freshwater flow into this part of the Atlantic (Apollonio 1979:30). Apollonio points out that this circulation and mixing of fresh and salt waters "concentrate[s] nutrients and encourage[s] the production of food suitable for immense numbers of larval and juvenile sea life that shelter within the estuaries" (*ibid*). River mouths and estuarine areas also form major indentations along the coast, providing additional harbors and anchorages for fishing vessels. Penobscot and Passamaquoddy Bays are examples of such well-protected regions, but there are many others as well (e.g. Sheepscot, Saco, Piscataqua, Damariscotta-Johns R., etc.).

One negative aspect of these riverine systems is the role they play in contributing to pollution. There have long been heavy industrial and residential developments along many of the region's larger rivers. Until recent years, they have poured large amounts of industrial and residential wastes into these rivers, and ultimately to the sea. The direct effects of such pollution are most visible in the clam industry, where long-term and seasonal flat closures have made it difficult for clammers to earn a living, forcing them in some cases to travel long distances to open flats, and increasing digging pressure on open areas. Mussels and marine worms are also quick to show the effects of pollution. Effects are perhaps less obvious on other species, but there is no question that eggs, larvae, and young of both fin-fish and shellfish can be adversely affected by pollutants in their estuarine breeding and feeding areas. Efforts to clean up industrial pollution sources and recent changes in laws governing sewage disposal along the ocean and other waterways are already improving conditions in many rivers. It is entirely possible that future decreases in riverine and coastal pollution will lead to increased survival of eggs, larvae, and young of many species, and possibly to increased catches for the fisherman.

Fishing, of course, is not confined to the immediate shoreline area. Therefore, a brief discussion of off-shore geography and water circulation will provide a further useful background for the description of the area's fisheries.

The major geographic zone off the northern New England coast is a roughly rectangular, partially enclosed area known as the Gulf of Maine.* Its total area is about 36,000 square miles, with

*Much of the following description of the Gulf of Maine is drawn from Spencer Apollonio's 1979 book, The Gulf of Maine.

an average depth of about 500 feet. It is bordered on the east by the shoreline and shoals stretching from Cape Cod northward to Cape Sable, Nova Scotia. On its seaward side, the Gulf "is enclosed on the east by Brown's Bank, a part of the Scotian Shelf; on the south by George's Bank; and on the southwest by Nantucket Shoals, a part of the East Coast Shelf" (Apollonio 1979:7). Northeast Channel separates Browns Bank from Georges Bank, and is the only deep water connection into the Gulf. Georges Bank itself, which has long been a major fishing ground, is less than 200 feet (33 fathoms) deep in most places, and in spots it is barely 13 feet deep (e.g. Georges Shoals, Cultivator Shoals). On the west, Georges Bank is separated from the East Coast Shelf by the relatively shallow (about 260 feet) depression known as the Great South Channel.

The underwater topography, bottom materials, temperatures, and currents of the Gulf of Maine and adjacent banks and shoals are extremely complex, but make the area an ideal one from the standpoint of fishing. Topography and bottom materials in the Gulf have resulted from a combination of stream erosion, glacial scouring, land emergence and subsidence, and shuffling of sediments. Geologically, the Gulf is quite new, having existed in its present form for only the last 13,000 years or less (Apollonio 1979:48). There are hundreds of ridges, banks, gulleys, and depressions, covered with rock, gravel, sand, shell and mud bottoms.

In the inshore area (roughly within the 60 fathom, or 360 foot, line) lie a series of banks and shoals about twelve to fifteen miles from shore. These are generally rocky or gravelly patches, frequented especially by groundfish such as cod, haddock, and pollack; between these harder patches are areas of muddy bottom, where hake may be found, and in a few places there are sandy stretches. Best known of these inshore banks, moving from east to west, are: Outer Schoodic Ridge, Mount Desert Rock, the Grumpy, Hatchell Ground, Matinicus Sou'sou'west Ground, Seguin Ground, and Kettle Bottom; from the West Cod Ledge off Casco Bay to the Isle of Shoals, on the Maine-N.H. border, stretches another series of inshore grounds: Cape Porpoise peaks, Inner and Outer Bumbo, Boone Island Ground, Ten Acres, and Blue Clay. Slightly east of these latter grounds and further out in the Gulf lies Jeffreys Ledge, and even further east are Platts Bank, Three Dory Ridge, Jeffreys Bank, Fippennies, and Cashes Ledge. Still out in the Gulf but further to the northeast are the Grand Manan Banks and, off Nova Scotia, Lurcher Shoals and German Bank. The seaward side of the Gulf of Maine is composed of several large banks, which begin with the Nantucket Shoals (off Massachusetts); next, largest, and most important for fishing is Georges Bank, which is separated from the Nantucket Shoals and East Coast Shelf by the Great South Channel. The bottom of Georges is principally sand, with patches of gravel, pebbles, and rocks. Brown's Bank, separated from George's by the Northeast Channel, is the last bank in this series which is of importance for New England and Canadian fisherman today. However, it should be noted that this chain of off-shore banks continues, following the same, roughly northeasterly, line to the Grand Banks off Newfoundland.

The productivity of fisheries in the Gulf of Maine is strongly affected by water depths, currents, and circulation. Ultimately, the abundance of aquatic life is dependent on the microscopic organisms (especially plankton) which form the beginning of the food chain. Only near land and over the continental shelf are organic carbon and dissolved minerals present in sufficient quantities to support these microscopic organisms. Since most of these organisms live near the surface because of their light requirements, they require constant mixing and circulation of water to bring their required nutrients. Bottom waters are especially rich in nutrients, since there is less plant growth in these dark depths to deplete such nutrients, and since bottom waters receive nutrients, deriving from dead and decaying plants and animals sinking down (Apollonio 1979:38). Thus, some of the world's richest fishing areas are those where the bottom is relatively shallow and where there is a good deal of water movement to distribute dissolved nutrients.

The waters of the Gulf of Maine show both horizontal circulation and vertical mixing. Surface waters usually flow counterclockwise, in a rough ellipse. This pattern is strongest in the spring, and later in the year the eddies become more diffuse and the patterns weaker. In the eastern Gulf a strong current sweeps northward towards the shore of Nova Scotia; this divides into two components, one of which continues northerly into the Bay of Fundy while the rest swings over the Grand Manan Banks toward the Maine shore. This surface circulation has important effects on the distribution of eggs, larvae, and young of many commercial species, as well as on plankton distribution. The eggs, etc. of species which spawn over the offshore banks during the spring and summer are carried by the prevailing currents towards the closer inshore "nursery areas."

Currents in the Gulf are produced by four major sets of factors: (1) the heavy runoff of light, warmer freshwater from rivers in the spring, (2) strong tides, whose effects are increased by

the fact that the Gulf is a partially enclosed basin in the northern hemisphere of a rotating sphere, (3) the immense volume of low salinity water flowing out of the Gulf of St. Lawrence in the spring, and (4) the flow of saltier and warmer deep water moving westward along the continental shelf off Nova Scotia, which enters the deep basins of the Gulf through the Northeast Channel (Apollonio 1979:35-37).

In several places, the inshore flow of bottom waters and the countervailing movements of surface waters produce marked vertical mixing, so essential in bringing up nutrient-laden bottom waters. One of these major areas of "upwelling" is off the southwestern coast of Nova Scotia. Another lies about 10 miles off the Maine coast, where it stretches southwesterly from about Grand Manan Island to an area between Schoodic Point and Matinicus Island (Apollonio 1979:38-39).



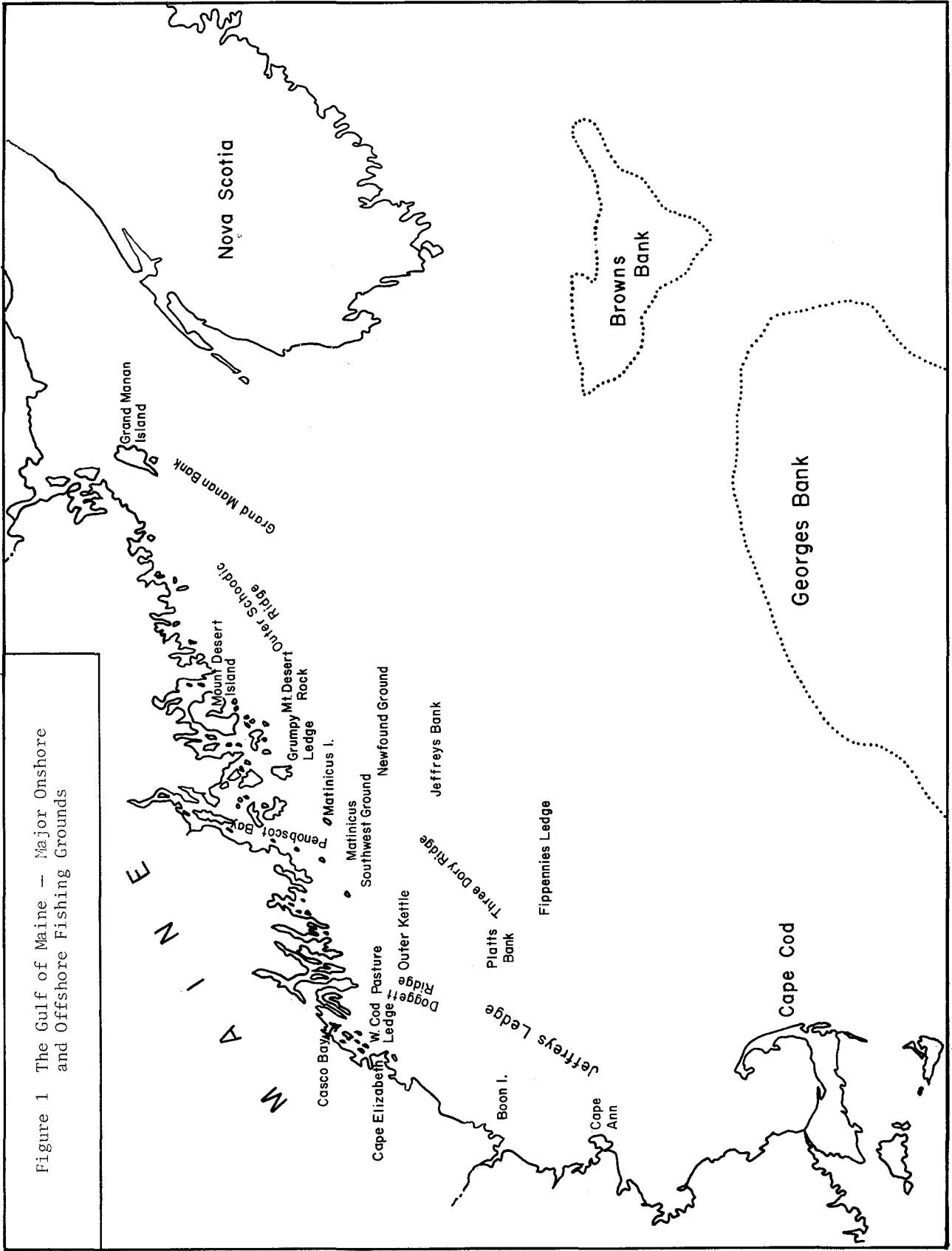


Figure 1 The Gulf of Maine — Major Onshore and Offshore Fishing Grounds

Fisheries Biology

In order to understand the current state of northern New England fisheries, as described in these port studies, a very brief biological discussion of major commercial species is necessary.* Only information relevant to the harvesting of these species is included here. (Other biological data, related to fisheries management issues, will be found in other sections of this report.) This will include information on habitats, behavior, yearly cycles, and in some cases reproductive patterns, as these all affect fisheries practices.

Groundfish

The category of groundfish includes a variety of species, with somewhat different habitats, behaviors, and life cycles. All have in common a propensity for moving and feeding close to the ocean bottom over the continental shelf. However, some never go very much off the bottom (e.g. flatfish), while others show vertical movements. The grouping of these fish together is based partly on historical, technical, economic and social factors involved in their exploitation. Species covered here are cod, haddock, pollock, cusk, and hake (white, red and silver, the last also termed whiting), all in the family Gadidae, and flatfish--blackback and yellow tail flounder, dab, and gray sole (all sometimes popularly referred to as "flounder" or "sole") and halibut. Redfish, or "ocean perch" as it is marketed, is another important groundfish. Especially in Maine, redfish account for a huge proportion of non-herring, finfish landings. Because the harvesting, processing, and marketing of redfish is a specialized, vertically-integrated, and highly industrialized operation, this species will be discussed in a separate section. Nonetheless, it is a bottom-dwelling fish, caught by the same techniques as other groundfish, and those harvesting it certainly have the capability to switch to other groundfish species.

Hake and Cod Families

Cod (Gadus morhua) has historically been one of the most important species in the North Atlantic. It lives mostly near the bottom and has been caught in waters as shallow as six feet and as deep as fifteen hundred. Many are found over rough bottom near shore. However, the most famous grounds are in the offshore banks, including the Grand Banks and Georges Bank.

Cod spawn in the late winter and early spring (March to May), with a single female producing up to 1,000,000 eggs. Growth of the young cod is relatively fast: to seven inches long in the first year, fourteen by the end of the second, and twenty by the end of the third when they become commercially valuable and begin to spawn (Jensen 1968:4). A large inshore cod can average thirty-five pounds.

Many young cod are to be found near shore, but there is a tendency for seasonal movements based on water temperature changes: inshore in winter months and offshore to deeper and cooler water during the summer (Hamlin and Ordway 1974:75). There is some evidence that stock on the offshore banks tends to remain there, but there may be one group that has a seasonal migration from off the mid-Atlantic states to the Nantucket shores off Massachusetts (Jensen 1968:4).

Cod feed primarily on shellfish, squid, and small fish, including young herring, haddock, and even young cod. The spiny dogfish (a type of small shark) is their principal enemy (aside from man).

The historical importance of cod came about partly because of its abundance and partly because it could be easily preserved. Until the 20th century, almost all the catch was split, salted, and dried. Cod was the food mainstay aboard many sailing vessels, and was a staple food among poor people in many parts of North America, Europe, and the Caribbean.

*Excluded from the description here are species which have been commercially important in the past or which may become commercially important in the future (e.g. mackerel, shrimp, squid, etc.) Only species which were being caught by fishermen from Maine and N.H. ports in 1978 are discussed.

Haddock (Melanogrammas aeglefinis) have long been a principal food fish in countries bordering the North Atlantic. In the western Atlantic their range is principally from Georges Bank and Cape Cod to the Grand Banks. Adults are bottom dwellers, where temperature ranges are about 34 degrees to 50 degrees F, and are almost always found at depths of less than 600 feet (Grosslein 1968:1).

Spawning takes place from the latter part of January to early April, with an average-size female hatching 2,000,000 eggs (Hamlin and Ordway 1974:77). On Georges Bank, haddock grow by the end of the third year to a length of sixteen to eighteen inches and a weight of one and a half to two pounds. At this time they are sexually mature and begin to be commercially exploited (Grosslein 1968:3). (In this smaller size range they are marketed as scrod.) Haddock are a smaller species than cod; individuals longer than thirty inches or heavier than twenty-five pounds are rarely caught, and the maximum age is believed to be about fifteen (ibid).

Feeding patterns and predators are much the same as those for cod, though haddock are not found as deep as some cod have been.

The United States haddock fishery expanded greatly with the growth in freezing and filleting technology and the development of otter trawling. It was the first species in which fillets rather than whole fish were shipped to retailers (Jensen 1967:8). Landings have declined markedly since reaching a U. S. peak in 1925-29, due to foreign competition and a reduction in stock size (Grosslein 1968:4).

Pollock (Pollachius virens) is considered to be a less desirable species than cod or haddock, and has not commanded as high prices as these species. Maine landings of pollock have far outstripped those of haddock since 1971, and have been slightly above cod since 1975. (Very recent catches have been affected by quotas on the more "popular" species--cod, haddock, and yellowtail flounder.)

Pollock are a schooling species found on both sides of the North Atlantic. In North American waters they occur from Newfoundland to Cape Hatteras, with the most abundant concentration located in the Gulf of Maine and the Scotian Shelf (Steele 1963; Bigelow and Schroeder 1953). They are usually found at depths of 660 feet or less; in the Gulf of Maine, they are more abundant along the coastline, the offshore banks, and isolated fishing grounds rather than in deeper central basin areas (Bigelow and Schroeder 1953:218). Water temperature is apparently a major environmental factor affecting pollock distribution. The tolerable range is about 23 degrees F to 61 degrees F, but temperatures of at least 37 degrees F are needed for incubation of eggs; this sets a northern limit on the geographic range of permanently resident pollock populations (ibid:215). Large pollock have been observed to avoid surface waters exceeding 52 degrees F, while smaller (eight to ten inch ones) avoid waters above 61 degrees F (ibid).

The major spawning area for pollock appears to be between Cape Cod and the Isle of Schoals (Bigelow and Schroeder 1953:219). Spawning takes place in the fall or winter (October to early March) over hard and broken bottom. Pollock grow to a weight range of four to fifteen pounds and become sexually mature by about age five (Hamlin and Ordway 1974:78).

Pollock are not strictly a bottom dwelling fish, but range from the surface to the bottom, feeding mainly on shrimp and many species of young and small fish. There is some migratory movement, especially of younger fish which tend to move inshore and offshore in response to seasonal temperature changes. Food availability also influences pollock behavior. Since larger pollock feed on the young of other schooling species, schools of pollock tend to follow their preferred prey.

Cusk (Brosme brosme) are relatively solitary compared to some groundfish, and are not as abundant anywhere as cod, haddock, or hake (Bigelow and Schroeder 1953:239). It is a cool water fish (preferring a temperature range of about 33 degrees F to 50 degrees F), usually found at depths of 15 to 100 fathoms (90 to 600 feet). They range, however, down to 250-300 fathoms (1500 to 1800 feet) on the continental slope off southern New England (ibid). The type of bottom where cusk are usually found is hard, especially where there are a good many rocks or gravel; they are seldom caught on sandy bottom. The cusk's preferred food appears to be crustaceans and mollusks.

Cusk spawn in spring and early summer, in relatively shallow water in the Gulf of Maine. A cusk may grow to a maximum size of 3 1/2 feet and 27 pounds, but the average of those caught in the Gulf of Maine is about 1 1/2 to 2 1/2 feet long and from about 5 to 10 pounds in weight.

(Bigelow and Schroeder 1953:239). They are sluggish swimmers, and remain much closer to the bottom than cod or even hake (ibid).

While cusk is a good food fish, Maine and New Hampshire landings are not high, and cusk is mainly a by-catch in other groundfish fisheries.

Silver hake (Whiting) (Merluccius bilinearis) is not currently (as of 1978-79) a major species in Maine and New Hampshire landings (due probably to low prices). However, whiting has in the past been landed in large quantities. For example, from 1950 to 1973, it exceeded cod and haddock in Maine landings. It was not used as a food fish until the early 1920's, when it began to be processed extensively in frozen form for midwestern markets. Small whiting are sometimes used for animal food and for fish meal and fish protein.

Whiting inhabit continental shelf waters at depths of about 30 to 600 feet. They have been found from Newfoundland south almost to North Carolina. Spawning takes place between June and September in inshore waters from Maine to New Jersey and offshore in the Georges Bank area. Whiting are relatively small as adults--males up to fifteen inches and females as large as twenty four inches, with weights up to five pounds; however, fish above two and a half pounds are rare (Fritz 1973). They become mature at two years and of commercially important size by three years (Hamlin and Ordway 1974:78).

Whiting show daily vertical movements, moving toward the bottom during daylight hours and toward the surface at night. They feed on the young of nearly all fish, including young whiting. In winter, they tend to move offshore to waters from 350 to 700 feet deep.

Hake (white and red) (Urophycis tenuis and Urophycis chuss) landings have exceeded that of whiting in Maine since 1975. White hake is increasingly being marketed as a substitute for cod and haddock as these latter species have become subject to catch quotas. Red hake is often used for industrial feeds. The two species are very similar in appearance, and are often grouped together in fisheries statistics (the two were not separated in N.M.F.S. landings figures until 1944, and they are still misreported). However, the white hake grows to a somewhat larger size than the red (up to sixteen pounds for the former, seven or eight for the latter) (Bigelow and Schroeder 1953:223).

Hake are abundant throughout the Gulf of Maine. Both species are found along the lower slopes and ledges in the inner parts of the Gulf, on the mud floors between them and along Georges Bank, especially its northwest slope (Bigelow and Schroeder 1953:227). Adults tolerate waters as low as 33 degrees F, but are most often found where the temperature range is about 35 degrees F to 50 degrees F. Seasonal migrations may be partly related to temperature changes; adults tend to move away from shallower (i.e. warmer) waters off west-central Maine in the summer, and conversely move inshore in those areas in fall and winter. Although they have been found in water as shallow as ten feet, both red and white hake prefer deeper water. Red hake have been caught down to about 175 fathoms (1050 feet) and white to about 545 fathoms (3270 feet); but the 60 to 70 fathom (360 to 420 foot) zone appears to be the most densely populated (Bigelow and Schroeder 1953:227).

Hake spawn inshore, or in shallow areas during the late spring and summer months, although white hake may spawn as early as late winter (Bigelow and Schroeder 1953:229-230). By age one, the young are at least six or seven inches long, and by age three, when most begin to spawn, they are sixteen to nineteen inches long (females being bigger).

Hake stay quite near mud bottom much of the time, but come up somewhat to feed; they eat primarily shrimp and other small, bottom-dwelling crustacea, along with squid and the young of many other species (e.g. herring, menhaden, cod, mackerel, etc.). Their feeding takes place mainly at night, which is the time they are most easily caught (Bigelow and Schroeder 1953:22).

Flatfish includes various species of flounder and sole, and halibut. Halibut are very large and bring a premium price. However, they will not be discussed here since stocks are currently very low. Species of major importance in Maine and New Hampshire are: dab (Hippoglossoides

platessoides), gray sole (Glyptocephalus cynoglossus), blackback (Pseudopleuronectes americanus), and yellowtail flounder (Limanda ferruginea). Since 1977, yellowtail has been subject to regulation under the Fisheries Conservation and Management Act; in addition it is not found in large numbers north of the waters off Cape Cod, so it is not as important in northern New England fisheries as it is further south.

The various flounders and soles are all found on smooth bottoms, some on mud, some on sand-mud mixtures, and some on sand. Dabs and grey sole are found in relatively deeper waters (preferring the 100-150 fathom, or 600-900 foot range), while blackback and yellowtail are caught more commonly in the 25-45 fathom (150 to 270 foot) depths (Bigelow and Schroeder 1953:261, 272, 280, 286). Dabs and grey sole are also cooler water species than yellowtail and blackback. In Maine inshore waters and offshore banks dab and grey sole are much more abundant than yellowtail, and somewhat more abundant than blackback. These last two species have a somewhat more southerly range.

These species spawn at different seasons: blackback in winter and early spring, grey sole and dab in late spring and early summer. The young grow at approximately the same rate up to a point, and most are sexually mature by age three years. Adult sizes vary, however. Dabs average 12-24 inches (smaller in cooler waters), yellowtails 15-21 inches, blackbacks 12-15 inches, and grey sole 12-20 inches (Bigelow and Schroeder 1953: 260, 272, 277, 286).

All are strictly bottom fish, and rarely rise more than a few feet from the bottom once they have past the "fry" stage. All eat mainly bottom-dwelling crustaceans, sand dollars and other echinoderms, worms, etc.; only rarely will these species eat any fish. They have few predators by the time they reach adult size, except perhaps large cod and dogfish. Many burrow into soft bottom for safety and food-seeking, with only their eyes showing. Because of their bottom-dwelling behavior, they are caught almost exclusively by bottom trawls (otter trawls).

In the last several decades, yellowtail has been one of the most sought-after flounder species, and has become badly overfished. It is currently one of the species subject to management (along with cod and haddock) under the groundfish plans of the New England Regional Fisheries Management Council (set up under the Fisheries Conservation and Management Act of 1976.)

Herring

The Atlantic herring, or sea herring (Clupea harengus L.) has historically been one of the most important fisheries species in the North Atlantic, and one of the most abundant. It is in the same family as alewives, shad, and menhaden. Herring travel in dense schools through open waters that border the continental land masses of temperate and boreal latitudes (New England Regional Fishery Management Council 1978: Appendix 1, p A1-3). Herring populations are found on both sides of the Atlantic. In the western North Atlantic, their range is delimited by the Labrador Current to the north and the Gulf Stream to the south; the major populations are thus found over the continental shelf from Cape Hatteras to northern Labrador, and from the coast out to about the 100 fathom (600 foot) contour (ibid, p A1-4). Herring may be taken by the fisherman in large quantities because of their schooling behavior. They are also preyed upon by many other species, such as silver hake, striped bass, mackerel, tuna, dogfish, sea turtles, and various species of birds and marine mammals. Being plankton feeders, they are an important link in the food chain between plankton and larger predators (ibid, p A1-3).

Spawning of herring in this area takes place in the late summer and fall, mainly along the mid and east coastal areas of Maine and in Canada's maritime provinces. Eggs are laid on gravelly or rocky bottom near coastal headlands, primarily at depths from 36 to 300 feet; temperatures of 5-12 degrees C (41-54 degrees F) are needed for spawning and incubation of the eggs (Ridgeway 1975). For the first seven months after hatching, herring larvae are subject to moving by prevailing currents, and feed in the surface waters. An abrupt change in body form and behavior takes place at about seven to eight months. After this metamorphosis into the adult body form, herring begin to school and to exhibit migratory behavior. Some studies have suggested that these juvenile herring have a tendency to move into shallow, coastal waters, but very little is known about the habits of post-larval herring (New England Regional Fishery Management Council

1978: Appendix 1, pp. A1-20). Herring become sexually mature at age three or four; by four years almost all herring begin to spawn and are termed adults. They may continue to spawn for several years thereafter.

Herring schools are normally composed of individuals of roughly similar age and size. Herring show marked seasonal behavior patterns which are related to environmental cycles, reproduction, and feeding. These patterns vary with the age of the fish. Along the coast of Maine, large schools of juvenile herring during the spring and summer of their first year of life move inshore along the immediate coastline. By fall, these fish (now in their second year) are gone from the nearshore surface waters, but may winter over in close by deeper waters. Juvenile herring in their second and third years move into shallow coastal waters off Maine and New Brunswick where they provide the major stock for the inshore sardine fishery. Peak catches in Maine's west and central coastal areas usually occur in late June, with catches declining rapidly in July and August; fall sees another peak in catches in the west. The more easterly coastal areas have their peak catches in late July (New England Regional Fishery Management Council 1978: Appendix 1, pp. A1-13). This suggests a movement of juveniles northeastward in spring and southwestward in fall (Speirs 1977).

Herring four years and up are known to migrate extensively. During warmer months they may be found in offshore, cooler, deeper waters. In late summer and early fall they are in the spawning grounds, and in winter months they move and disperse to warmer waters (op sit: Appendix 1, p A1-10, 11). In recent years, large amounts of adult fish have been caught off Massachusetts and further south by pair trawlers and purse seiners. Closure of the Georges Bank herring grounds to foreign fishing is one of the major factors making possible these large catches of adult herring.

The catch of herring has fluctuated greatly since 1880. The factors responsible for this fluctuation are not yet well understood. There has been tremendous variability in the proportions of catch by different gear types from year to year, and in the proportion of the catch made along various coastal areas. Especially for fixed gear (stop seine and weir) operators, the herring fishery has traditionally been a "boom or bust" situation. Since the 1960's larger herring, which can be captured by mobile gear offshore, have become increasingly important. Some of these are used for canning when smaller fish are unavailable, canned either whole or in steaks and other specialty forms. As canners have begun to use larger fish, more purse seiners have begun to operate in nearshore areas. (See Lozier 1978 for herring catch data.)

Further pressure on the adult fishery came during the 1960's from foreign vessels operating offshore. The decade from the mid-1960's to the mid-1970's saw Maine inshore catches reduced greatly from those of the previous decade, a situation very likely related to the intensification of foreign efforts on the adult offshore stocks. In 1972 foreign efforts began to be restricted by ICNAF catch quotas. In 1977, after U. S. withdrawal from ICNAF and the implementation of the Fishery Conservation and Management Act, foreign fishing became completely controlled by the U.S. out to the 200 mile limit. The increase in Maine landings since 1976 may very well be due to the decrease in foreign offshore catches, first begun under the ICNAF quotas.

In the future, Maine landings are likely to be affected by the increasing use of mobile gear for catching adult herring (purse seines and pair trawls) both nearshore and offshore. There is a growing European market for the larger adult herring, which are filleted and frozen before being shipped overseas. Currently, U. S. management efforts are aimed at achieving a biologically, socially, and economically workable balance between catches by various gear types, in various areas, of various ages of herring.

Redfish (Ocean Perch)

Redfish (*Sebastes marinus*) is a bottom dwelling species found in deep waters on the continental shelf of the North Atlantic. Its range is bounded approximately by Arctic waters on the north and the Gulf Stream to the south. In North American waters, it occurs from off Cape Cod, north along the coasts of Maine, Nova Scotia, Newfoundland, and Labrador. Redfish have been found where water temperatures range from 33 degrees to 53 degrees F, but the biggest concentrations are around deeper basins where the temperature is about 37 degrees to 47 degrees F (Kelly et al. 1972:2).

The life-cycle of the redfish is somewhat unusual in comparison with other fish of the area. It gives birth to live young, with an incubation period of 45-60 days in the population found in the Gulf of Maine. Young are released in May and June, and the average number of "fry" at the time of hatching is 15-20,000 (ibid:11). Redfish is a slow growing species, and also very long-lived. The young grow, on the average, three inches in the first year and an inch or so a year thereafter until they first spawn, at about age ten (ibid:12).

Redfish prefer rough bottom and rocky slopes between 30 and 350 fathoms (180 to 2100 feet), but are found most abundantly between 70 and 200 fathoms (420 and 1200 feet) (ibid:2). They feed mainly at night, on shrimp which are found somewhat above the bottom. Redfish are therefore caught mainly in the daytime when they are found closer to the bottom and can be more easily captured by otter trawl (ibid:12).

Redfish has been called the "Cinderella of New England commercial fishes" (Jensen 1967:9). Until the 1930's, very little redfish was marketed. After World War I, small amounts began to be sold fresh in the United States, but it was the development of filleting and freezing techniques which ultimately led to the rapid expansion of the fishery. According to Jensen (1967:9), a fish cutter discovered by chance that redfish "yielded a small white fillet with a taste and texture similar to fresh water perch." Renamed "ocean perch," the product found a ready market in the American South and Midwest. Since 1935, when intensive fishing for redfish began, the New England redfish fishery has constantly shifted fishing locales as stocks were depleted and new stocks discovered. A sharp decline in landings set in during the mid-1960's; the recent extension of the Canadian offshore territorial limit to 200 miles has further affected redfish landings by limiting the areas where U. S. fishermen may catch this species.

Tuna and Swordfish

Tuna and swordfish are far-ranging, migratory species which are found in Maine and New Hampshire waters during the summer months. Almost all boats which go for these species do so for only brief periods, and are mainly in other fisheries (especially lobster and groundfish). There are, however, a few Maine fishermen who are beginning to follow the swordfish throughout its range, which covers the entire east coast as far as Florida.

The bluefin tuna is the largest commercial species caught in Maine and New Hampshire and the largest Gulf of Maine fish except for some sharks. A tuna may go over 1000 pounds and be as much as 14 feet long. It is a strong, fast fish, an "oceanic wanderer" (Bigelow and Schroeder, 1953:340). Tuna up to 350 to 500 pounds or so often travel in small schools (up to 30 or 40), but sometimes in much larger concentrations. Each school is usually composed of fish about the same size. They concentrate along the Maine and New Hampshire coast in the summer (July and August) in areas where the surface waters are around 60 degrees F or higher (larger fish may be found in waters down to 50 degrees to 54 degrees F). Apparently they are attracted to the continental waters by concentrations of prey (herring, mackerel, etc.).

Tuna may be caught by rod and reel, harpoon, and longline, though no one in Maine is currently using longlines for tuna.* They are fairly easily spotted as they jump through the water, and even when they are not jumping, schools at the water's surface splash a good deal.

Swordfish is another oceanic, warm water fish, whose migrations generally parallel the Gulf Stream and bring it to waters off Maine in July and August. It is a large fish, up to 600 or 700 pounds and 15 feet long; the average fish is smaller, however, perhaps 300 pounds (Bigelow and Schroeder 1953:352). Although they may gather in certain localities in search of prey (mackerel, menhaden, silver hake, herring, etc.), swordfish are solitary rather than schooling fish. On calm days, they often lie on the surface, and are easily harpooned from a pulpit projecting from the front

*The tuna fishery in Maine is mainly a sport fishery, even for commercial fishermen. Nonetheless, it is a large and therefore high value fish, so a commercial fisherman could gain a fairly high income from tuna during the short periods when he is going after this species.

of the vessel. They are also commonly caught by longlines, and sports fishermen sometimes go for them with rod and reel.*

Lobster

The American lobster (*Homarus americanus*) is a hard-shelled, bottom dwelling crustacean, found in waters off the Atlantic coast of North America from Newfoundland to the Carolinas. Far more lobsters are caught in Maine than in any other state, and lobster is Maine's most important fishery in landed value. It is also an important fishery in New Hampshire.

Adult lobsters may be found at a wide range of depths--from 6 to 1200 feet. Inshore lobster concentrations are greatest at depths of about 120 feet and less; the optimum catching depths vary with the season. Further offshore, they are found in depths between 600 and 1200 feet. Inshore lobsters show seasonal variations in depth preferences, at least as this can be measured by catch statistics. Lobsters tend to inhabit rocky bottom, but in winter may forsake hard bottom to burrow in the mud. There is some evidence that kelp-rich areas are attractive to lobsters, possibly because of the camouflage it provides.

The lobster eats a wide variety of food, including both living and deceased organisms. Its preferred diet probably consists of small crustaceans, mollusks, and fish. It is also cannibalistic, and will attack, younger, smaller, and soft-shelled members of its own species. This is particularly true of lobsters in captivity (in traps, "cars," pounds and tanks). Such cannibalism is a significant factor which fishermen, dealers, and lobster pound operators must take into account in their operations (for example, separating hard from soft-shelled individuals, injured ones from healthy ones, etc.).

Temperature is a significant factor affecting lobster activity and catchability. It also affects movements, migration, recruitment, growth and survival. Dow suggests that the optimum mean annual sea temperatures for lobster are in the 9-11 degrees C (48 to 52 degrees F) range (surface temperatures as measured at Boothbay Harbor) (Dow 1976).

A few female lobsters become sexually mature when they are about 80-90mm (3.2 to 3.6 inches) long (carapace length), but in Maine 50% of female lobsters do not mature until they are at least 90-95mm (3.6 to 3.8 inches) in carapace length (Krouse 1972). Males, by contrast, are mature at a much smaller size, 45-70mm (or 1.8 to 2.8 inches) (*ibid*). At mating, the male lobster deposits sperm in the female's seminal receptacle where it remains until the eggs mature, which may be up to a year. Up to 50,000 or more eggs may be extruded at a time onto the female's abdominal appendages where they are carried until they hatch (usually the next summer).

Growth rates of lobsters are generally unknown, though available data suggest that they are normally 30-40mm (1.2 to 1.6 inches) by the end of their first growing season. When the lobster's body has grown beyond the limits of its inelastic shell (yearly for commercial-sized individuals) molting (or "shedding") takes place. The summer months of June to August is the normal molting time in Maine and New Hampshire. Lobsters in the western part of Maine and in New Hampshire molt about four to six weeks earlier than those in extreme eastern Maine. A newly-molted lobster is lean, weak, and has a paper-like shell. In this state, it is very vulnerable to predation, and seeks shelter until its shell hardens.

Commercial-sized lobsters exhibit seasonal patterns of movement and activity related to their own bodily cycles (molting and mating) and to water temperature changes. Although some tagging

*Like the tuna fishery, the swordfish fishery is mainly carried out by sports fishermen and by a few commercial fishermen (lobstermen and groundfishermen) who fish for swordfish a few weeks a year. There are, however, a few boats which go for swordfish year round, following the fish over their annual north to south migration route from the Maritimes to Florida (see discussion in section on Portland, this volume).

studies have suggested that American lobsters do not exhibit seasonal migratory behavior, more recent work has indicated that most northern New England coastal lobsters "undergo extensive localized movements" (Krouse 1977:6). In addition, long distance migrants in the tagging studies (those which moved more than 20 miles) followed a generally south/southwesterly course, probably because of the counterclockwise coastal currents (*ibid*:6-7). Whatever the exact mechanisms, lobsters are caught by fishermen in different places at different seasons. In winter, when on-shore waters are very cold, they are best trapped in water over 30 fathoms (180 feet) deep, where there is warming caused by an inversion effect from the Gulf Stream (Acheson 1972:65). During this season, therefore, fishermen typically set traps 3 to 10 miles offshore. In late spring and early summer, as the nearshore waters warm, they can be caught closer to shore--often within feet of the surf. During the summer molting season, fishing is so bad that many fishermen do not fish at all. Finally, as the water cools in the fall, lobsters may again be caught farther offshore.

Soft-Shell Clams

The bivalve mollusk commonly called "the clam" in Maine is known elsewhere as the soft-shell clam, the long-necked clam, or the steamer clam (*Mya arenaria*). Soft-shell clams live along the coast wherever there are tidal flats, in tidal river systems as well as on island flats miles out to sea.

Spawning occurs from June to September when water temperatures are most favorable. Fertilization between the discharged eggs and sperm takes place in the water, and the larvae are distributed considerable distances by water currents. The young clam becomes permanently established in its burrow before it is an inch long. Clams generally do not migrate after they have grown one inch in diameter. However, small, healthy clams can be successfully transplanted in certain areas, provided they are given adequate protection from their enemies.

Clam growth rates vary widely due to a variety of environmental factors, the most important probably being temperature, food availability, crowding, water currents and water circulation (Dow and Wallace 1957:15). Generally, growth is most rapid where there is good water circulation. Water temperature and distance from the low tide level along the flat also affect clam growth rates. Clams near low tide level, where the flat is exposed only at the lowest low tides, are not as available to fishermen; therefore, they live longer and grow larger (Dow and Wallace 1957:7). Discounting local variations, in general clams in New Hampshire and the western part of the coast of Maine reach 1 3/4 inches in two to three years, while way downeast this size is attained only after five to seven years.

Pollution is a major problem in the clam industry. In Maine, for example, it is estimated that pollution ties up at least 18 percent of the state's potentially productive acreage, and prevents substantial quantities of clams from reaching market (Welch 1979:13). Domestic pollution is by far the greatest contributor, and some flats are regularly closed by the Maine Department of Marine Resources each summer when the increase in the human population directly affects the pollution level of tidal flats. Long range effects of contamination from industrial sources, from heavy metals, and from oil spills is largely unknown, but may prove to be significant (Welch 1979:13).

Marine Worms

A less glamorous product would be hard to imagine, yet in 1977 more than \$23 million worth of marine worms were harvested in Maine. Worming is not a commercial activity in New Hampshire. The worm fishery in 1977 was the fifth most valuable fishery in Maine. The bloodworm is the most valuable per unit of weight of any species harvested in Maine, and perhaps in the world, and the sandworm is the second most valuable species per pound. Marine worms are used as bait for game fish, and are marketed to sportsfishermen from Maine to Virginia.

The two types of marine worms harvested in Maine are the bloodworm (*Glycera dibranchiata*) and the sandworm (*Nereis virens*). Both are found in flats with compositions ranging from sand to silt. The bloodworm lives near the surface of the mudflat, while sandworms live further below. Both species are sensitive to temperature variations, and are adapted to environments where temperature

changes can be minimized. Mud is a good insulator; in the winter below the two inch level an even temperature of 34 degrees F is maintained, and in the summer, below 6 inches, a constant 64 degrees F is maintained.

The average bloodworm is from six to eight inches long. Sandworms are larger than bloods, averaging about ten to eighteen inches long. Studies from the Wiscasset (Maine) area indicate that bloodworms reach minimum market size some time after their first year. Larger bloodworms are usually three years old, and few live to be four. Sandworms reach commercial size by the end of their second year.

Scallops

The sea scallop (*Placopecten magellanicus*) is a bivalve mollusk, which occupies estuaries, embayments, and shoal areas throughout the waters of northern New England (Dow 1971:17B); however, major commercial areas are concentrated in the eastern part of Maine where bottom and tidal conditions are most favorable. Scallops are also found in shoal areas of both inshore and offshore banks, especially Georges Bank where there are large concentrations. Along the Maine coast, scallops are most commonly located in waters whose depths range from about six to six hundred feet. It seems to prefer depths of more than 30 feet, in areas where there is some current of the bottom waters. Hard ocean bottom--clay, rock, or shell--is their normal environment (Baird 1967:6-7).

The straight hinged shell of the scallop is made up of a chitinous outer layer and a nacreous inner layer. Inside, there is a large adductor muscle, which is the only portion of the scallop which is marketed; the viscera, mantle, etc. are discarded by the fisherman. Like many other mollusks, the scallop has a "foot," but this loses most of its original purpose after the larval stage; as the animal matures, the foot serves only to produce byssal threads by which the animal may attach itself to rocks, sticks, shells, and other scallops (Baird 1967:4).

Scallops become sexually mature at age three to four years, and spawning takes place annually thereafter. Since World War II, Maine landings have been comprised primarily of individuals in the sixth to ninth year age classes (some 66-100 percent of the catch); it is estimated that the sixth year class alone contributes 25-40 percent of the total catch (Dow 1971:17B).

Scallops up to four inches in diameter are capable of rapid movement, and are believed to swim out of the way of a scallop dredge (Baird 1967:7). Among the bivalves, only the scallop is capable of rapid and relatively sustained free swimming. This is accomplished by the rapid opening and closing of their shells, using the strong adductor muscle, which propels them through the water. However, these movements do not carry the scallop long distances, and larger scallops normally are attached to objects on the bottom. Many smaller ones are as well. Unlike most crustaceans or other truly mobile species, scallops do not pursue food, and do not readily move in response to minor environmental changes. Thus, they are regulated by almost the same environmental factors as clams, oysters, or mussels. That is, they are most abundant where food supplies are greatest and where water temperatures are most favorable (scallops are extremely sensitive to freezing temperatures, and thrive where water is relatively warm). Fishermen believe that scallop abundance can be enhanced by returning shucked shells to the areas where dredging has taken place. This is because scallops have a strong tendency to attach themselves to shells.

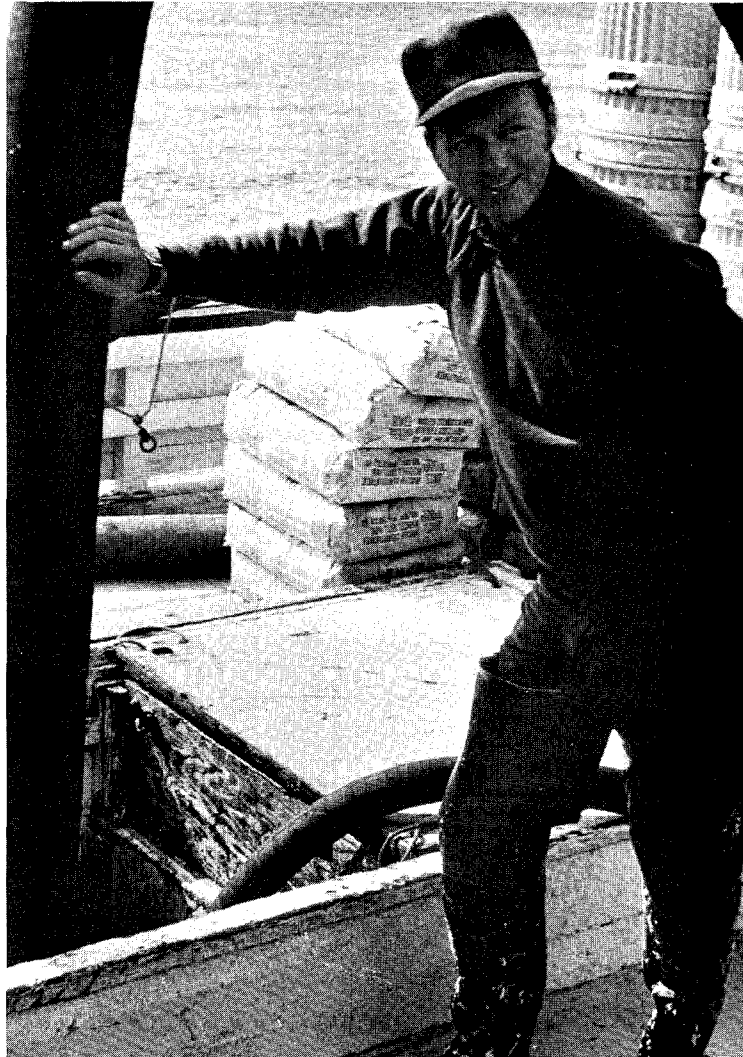
Mussels

The blue mussel (*Mytilus edulis*) is a bivalve mollusk, which normally is found attached to rocks by means of long, silky filaments projecting from one end of the body. It may spend its entire life attached to the same rock. Mussels are found both in the intertidal zone and in shallow waters below mean low tide. The areas where mussels are located are similar to that of clams, and they are sometimes so prolific as to exclude clams from the flats altogether.

Mussel harvesting in Maine and New Hampshire ports in 1978 was a minor activity, but increasing numbers of fishermen are beginning to go after this species. Mussel landings, in Maine especially, began to rise a good deal by the mid-1970's. Accompanying this rise in landings has come the

realization that some Maine mussel beds, especially in the mid-coast area, may already be showing signs of depletion.

Mussels are also being raised by a few aquaculturists in Maine, but as yet this is not a commercially viable operation in comparison with the raising of oysters, carried out in the same areas. (Currently, the limitations on mussel aquaculture are not so much in the production technology, which is fairly well-developed, but in the marketing sphere.)



CHAPTER 3

General Characteristics of Maine and New Hampshire Fisheries

Harvesting

In the following sections, we will provide: (1) a summary description of harvesting techniques and technology currently employed by fishermen in the study area, (2) a general discussion of seasonal cycles and fishing areas, (3) an introductory overview of certain social features of the various fisheries, necessary for understanding the port studies which form the body of this volume, and (4) a brief analysis of investment levels in the various fisheries.

In this discussion, our unit of analysis will for the most part be the individual fishery, i.e. herring, lobster, and so on. However, in some cases certain descriptions or generalizations cover several different fisheries, so the fisheries in question will be treated together in such instances.

Techniques and Technology

Since the early 1970's, most boat-based fisheries have been in the process of a major technological innovation--namely, the adoption of a good deal of sophisticated electronic gear. Only skiff fishermen and those who harvest by hand (clambers, wormers) have been immune to this "electronics boom." Therefore, before describing specific technology and techniques for catching various species, a brief summary of major types of electronic gear is in order. (A good deal of this summary is drawn from Acheson *et al.* 1978:75-78.)

The most common kinds of electronic gear found on boats are: depth finders and recorders, scanning sonar, Loran, VHF radios, C. B. radios, autopilot and radar. Many groundfish boats use all these kinds of gear, though not every boat carries all this equipment. On the other hand, some larger boats will have two of certain items; in case one malfunctions, valuable fishing time will not be lost. Most boats which purse seine herring use: depth recorder, autopilot, VHF radio, Loran-C, and radar; some have scanning sonar and Loran-C plotter as well. Vessels used in pair trawling (for herring) carry the same basic electronics as purse seiners, but usually have scanning sonar and Loran-C plotters. Some pair trawlers also have vertical sounders (line machines) and scrambler phones, the latter enabling the two vessels working with one another to communicate secretly. Inshore lobster boats do not use as many electronic devices; typical on-board gear might include a C.B. radio, depth finder, and, increasingly, small radar sets.

Depth finders and recorders and scanning sonar operate on the same basic principle, and all aid in showing the depth of the bottom and its general topography. Depth finders provide a reading of water depth and bottom at a particular moment, while recorders make a paper record of the bottom traversed by the boat. In all of these devices, pulses of sound are sent at regular intervals and the receiver records the time it takes them to bounce back; since sound travels at a fixed rate through water, the time lag can be translated into distance. The depth finder/recorder operates only in a straight line, but the scanning sonar sends out pulses around a 180 degree arc. The transmitting and receiving head (transducer) of the sonar is set in the boat's keel or bottom and can be adjusted to direct its transmission at any angle. Normally, it is set to obtain a picture of the bottom roughly six to eight hundred feet ahead and to the sides of the boat. An audio signal accompanies the visual representation. Since the sonar scans the bottom ahead of the boat, obstructions which might damage nets can be avoided. More important, the experienced fisherman can use these devices to "read" not only depths and topography but bottom material and even large concentrations of fish as well.

Loran is another significant electronic device which has gained wide acceptance. Formerly the so-called "Loran-A" system was used, but this is being replaced by "Loran-C." A Loran unit receives groundwave signals (very low electromagnetic wavelengths) from two transmitters at fixed onshore locations. The receiver translates these signals into numerical readouts representing

its relationship to each transmitter. It is possible to accurately determine the boat's location by plotting these numbers on a map with Loran coordinates noted on it. A fisherman can thereby keep records of successful fishing areas and areas where obstructions might cause difficulties, with a degree of accuracy down to \pm 50 feet.

Radar and the various kinds of radio are not used strictly in the fishing operation, but are important for general navigation and safety purposes. Radio can also be used for exchanging information with other fishermen or for gaining information through eavesdropping on others' conversations. Many boats are also equipped with automatic pilot devices, which are especially useful on longer trips.

Otter Trawls

The major technique currently used by Maine and New Hampshire fishermen for capturing groundfish and redfish is otter trawling, sometimes referred to as "dragging" or "bottom trawling." All types of trawling operate on a similar principle. A cone-shaped net is towed through the water, large end first. The effective size of the net is increased by an extension or "wing" on either side. The mouth is generally spread by means of "doors," which are generally heavy flat planes attached to the wings by wires. During towing, the doors are in a roughly vertical position and at such an angle to the direction of motion that the force of the water flowing through extends the width of the net (Hamlin and Ordway 1974:65). Doors are generally made of wood, with a heavy steel "shoe" on the bottom edge to protect them as they are towed over the bottom. The net is made of synthetic material (nylon or polypropylene) and tapers to a narrow "cod" end which can be closed during towing. The bottom of the net mouth (the ground line) is weighted and sometimes has rollers, while the top (the head line) has floats to help hold the mouth open; net sizes are usually given in terms of length of head line (Hamlin and Ordway 1974:57). An average otter trawl may be 100 to 150 feet long, from cod end to wing tip, and perhaps 60 to 100 feet wide along the head line. The net is towed by means of warps, which are wire ropes leading from the doors to the winch on deck. The warps pass through blocks hung from two gallows frames or a gantry to drums on the winch. Winches may be driven either from the main engine, or by hydraulic power; the latter, being more flexible, is becoming more popular.

Trawling may be done from side or stern. In the former, both gallows frames are on the side, the warps are towed from one quarter, and the net is hauled over the side. The advantages of this so-called "eastern rig" are that the pilot house is aft where the wave motion is minimized and the captain can pilot the vessel and observe the crew working forward at the same time. There are disadvantages. The working deck is forward, and therefore exposed, steering is poor, the vessel lacks versatility and hauling over the side can be dangerous in a sea. Stern trawling is an innovation which has arisen to avoid some of the disadvantages of side trawling. In stern trawling, the gallows or gantry are at the stern, towing is done from there, and handling is done over stern or side. This places the working deck aft, steering is easier, and the craft is more versatile (Hamlin and Ordway 1974:68).

When fish are located, the net is played out to a proper length for the depth of the water. Care must be taken to avoid broken bottom or other obstacles which can cause snags or extensive gear damage. Constant monitoring with electronic equipment is necessary to assure a safe and successful "tow." A "tow" usually lasts two to three hours. In hauling back, the doors are secured first, and then the net pulled in until the cod end can be lifted up above the deck and the contents released for sorting. If the tow has been a good one, the net may be placed back in the water immediately, unless it has been damaged.

Gillnets

Gillnetting is a technique used in groundfishing (though not in catching redfish). It has become increasingly popular in Maine and New Hampshire, and in recent years a growing number of boats have either added gillnetting gear or are switching exclusively to gillnets. The basic vessel type used in dragging or lobstering can be used for gillnetting. Gillnetting can easily be done by relatively small boats (36-40 feet), which might not have the power for efficient dragging.

Boats currently doing gillnetting range from 36 to 62 feet long. Gillnets catch fish such as haddock, pollock and cod which swim up off the bottom, but they do not normally catch the strict bottom dwellers such as flat fish. A gillnet is played out so that it hangs vertically in the water, with floats on the top and weights on the bottom. Individual gillnets are attached to one another in a line, sometimes as many as ten or more. An average small boat might be equipped with twenty. It may be floating or anchored, usually the latter. An average gillnet in Maine would be 300 feet long and 18 to 30 feet deep. Unlike trawling, which may scoop up everything in the net's path, gillnetting has an advantage in selectivity; the net mesh size can be varied so as to try to catch only fish above a certain size.

As in dragging, electronic gear is used to help locate fish or proper types of bottom. Besides electronic gear and nets, a gillnetter is equipped with net drums or power-blocks (usually hydraulically operated) for handling and storing the nets.

Gillnets are ordinarily left in the water for a day or two. However, if they are left for more than twenty-four hours the quality of the fish is noticeably reduced. Since the gillnet traps fish by the gills, the fish die rapidly and therefore will begin to decompose or are eaten by other fish and predators.

Gillnetting in Maine and New Hampshire is something of an interim technology at present. It is an attractive option for those who wish to begin to move into groundfishing without massive investment since the gear is less expensive than otter trawl gear, and since gillnetting may fruitfully be done from relatively small lobster boats or scallopers (36 to 40 foot range). In many instances, those who begin gillnetting eventually shift over to dragging, sometimes maintaining their gillnetting gear for a while and sometimes switching over completely to otter trawls. In the process, they normally also move up to larger boats, and shift their species emphasis so that groundfish becomes their major fishery or their only fishery. In some areas off New Hampshire and the western part of Maine, good groundfish "tows" are so far offshore that those gillnetting from small boats are not as likely to switch to dragging.

Handlines and Longlines (tub-trawls)

The use of lines and hooks for catching groundfish and other fish persists in very limited commercial use, primarily in the eastern part of Maine.

Longlining and handlining are done mainly from small (under 25 feet) boats, although some lobstermen with larger boats do a little in the spring when lobsters are scarce. The major groundfish taken in this way are halibut, pollock, and cod.

Longlining and handlining, as they are currently practiced in Maine and New Hampshire, are relatively old and primitive techniques. Handlining refers to fishing with two or three lines over the side of a boat to which one or more baited hooks are attached.

A longline, or line trawl, is a horizontal line with a series of shorter lines with hooks hanging from it. The longline is attached at either end to vertical lines which have floats on top and a weight or anchor on the bottom. Normally, both ends have vertical flags or markers attached to show where the gear is. Since small longlines are coiled in a tub before being played out in the water the term "tub trawling" is sometimes used rather than "longlining".

Longlining has certain advantages however. It is a relatively energy efficient technique. Moreover, line fishing can be a size and species selective procedure, since the fisherman can vary the hook size and the depth at which he fishes. For these reasons, we suspect that the future may see a good deal of automated longlining equipment used in the region. No automated longline systems, such as those made by the Mustad Corporation, are currently in use.

Herring Fishing Techniques

Herring are caught by two basic types of gear: fixed (stop seine and weir) and mobile (purse seine and midwater pair trawl). Traditionally, juvenile herring were caught mainly by fixed gear. Beginning in the 1920's an increasing amount of herring were landed as incidental catch in the mackerel purse seine fishery, and in the 1960's a more concerted purse seine fishery began for juvenile herring in inshore waters. The adult herring fishery is much more recent off Maine and New Hampshire and involves the use of mobile gear, i.e. purse seines and pair trawls.

Weirs

Brush weirs for capturing herring were used by Indians in Maine and the Maritimes prior to European settlement of the New World. Today, netting has replaced brush in many weirs, but the basic capturing principle remains the same. Weirs vary somewhat in design features, depending on different local conditions. However, certain common elements are always present. Weirs are composed of a series of stakes or poles driven into the ocean bottom; all have single or double "leaders" extending out from a "pocket" or "pound" enclosure, also composed of poles. Brush, netting, or a combination of the two is used between the poles to form a "wall." Weirs are set in coves and bays known to be frequented by herring. The leader(s) serves to direct or herd schools of herring into the pound or pocket where the fish are trapped. Many weirs in current use catch herring best on an incoming tide, but some do better on the outgoing. Herring enter weirs at night, and may be detected by the phosphorescence they stir up, by their slight splashing noises, changes in water color, or by electronic gear.

The catch is frequently held inside the weir for several days to allow the fish to eliminate all food from their digestive systems. So-called "feedy" fish (those with full digestive systems) break down very rapidly after being taken out of the water, and are not suitable for canning. The herring are retrieved from the weir through a purse seining operation, and are transported to the processor in a carrier vessel.

Stop Seines

Stop seining is a much newer technique than weir fishing. It has replaced an earlier technique of "haul seining." (Herring catch statistics until 1939 include haul seines and stop seines in one category.) Stop seining, like weir fishing, involves trapping juvenile herring when they enter a cove or bay. In this instance, the bay or cove acts as a "pound" with the stop seine net being drawn across the mouth of the bay after herring have entered. Nets in use today are commonly up to 200 fathoms (1200 feet) long, and 7 to 10 fathoms (42 to 60 feet) deep. Often there is a pocket attached to the seine and set over the deepest portion of the cove. Nets are stored in "twine dories" at the mouth of the cove. When herring enter the cove, the stop seine is attached to a point on the shore and the net played out from the dories as they are rowed across the cove mouth; the net is weighted to reach bottom, and has cork floats on top. When herring are trapped, they mill about, or seek to escape to deep water. Here, in the deepest part of the cove, they enter the pocket attached to the seine, which is then closed off trapping the herring. As in a weir operation herring may be kept in a stop seine for several days, until they are no longer "feedy," or until a carrier is available to transport them to the processor. To retrieve the fish, a purse seine is set in the pocket and the fish "dried out" for pumping into the carrier.

Purse Seines

A purse seine is a very large net up to a thousand feet long with weights and "purse rings" on the bottom edge and floats along the top edge. The net is set in a circle around a school of herring, and the two ends brought together. This is normally done by having a smaller boat working with the purse seine vessel to bring the net around the school. When the circle is complete, the purse line is drawn to close the bottom of the net. The average purse seine catch in a single "set" is about five to ten thousand bushels of herring, though it may go as high as 25,000. Many purse seine vessels haul their own herring catches to the processing plants, though some use

a carrier vessel.

Purse seine operations often use small planes to aid in locating herring schools. In addition, a good deal of electronic gear is increasingly being used for spotting fish. Before the advent of airplanes and electronic gear, purse seining was only done at night; then, the herring come closer to the surface to feed, and on a moonless night the surface of the water may have a phosphorescent glow when disturbed by the fish. Even today, purse seiners still go out at night, but they now have the aid of electronic gear.

In 1978, Maine purse seine vessels ranged in size from 38 to 70.6 feet. Average size was about 50 feet.

Purse seining is also used for catching mackerel, menhaden, or any densely schooling fish.

Mid-Water Pair Trawling

The technique of having two vessels tow a trawl net between them was introduced to Maine from Pt. Judith, R.I., largely through the aid of the Department of Marine Resources Extension Service, funded in part by Sea Grant. Pair trawling is used for capturing adult herring, and may be done either inshore or offshore. Menhaden, mackerel, and other comparable species may also be caught by this technique. Very large nets are used, as much as one-quarter mile long. At the mouth of the trawl, where the guiding panels are, a very large mesh (up to one foot) is used to herd the fish. The mesh gets progressively smaller, down to one to one and a half inches at the cod end. Beyond the capacity to capture a large amount of fish quickly, pair trawling has another advantage in that the vessels may begin another tow using the second vessel's net as soon as the first one is on board. If there is a large amount of fish, this capability gives pair trawlers a real competitive edge over a single vessel with a single trawl. Another advantage is that the towing of a trawl net by two vessels does away with the requirement for doors. Two smaller vessels, with less power individually, may be more efficient for towing a midwater trawl together than a much larger more highly-powered vessel operating alone.

Carriers

Carrier vessels are large wooden boats used to transport herring from weirs and seines to processing plants. They are usually owned by sardine canning companies. When herring are captured in a weir or stop seine, the owner notifies the company with whom he has a marketing arrangement and a carrier is sent. Some carriers double as purse seiners, and, as we have noted, a good many purse seiners do serve as their own carriers.

Lobstering Techniques and Technology

Lobstering in Maine and New Hampshire is an inshore, day-trip, trap-fishery. (By law, only trap-fishing for lobsters is allowed.) It is carried out by boats ranging from small, unpowered skiffs to 45 foot vessels. Most skiffs are in the 14 to 25 foot range and are powered by two-cycle outboard motors, usually 18 to 25 horsepower class. The vast majority of skiff fishermen operate only during the summer. The typical "year-round" commercial operation is carried on with an inboard-powered boat about 33 to 35 feet long, though smaller and larger vessels are certainly found in significant numbers. In the Casco Bay area of Maine, for example, where each fisherman owns very large "gangs" of traps, average vessel size is larger than elsewhere in the state, being in the 37 to 40 foot range.

Boats and on-board gear. Wood is the traditional material for lobster boats, and is still the most common one, but fiberglass boats have been adopted in substantial numbers in the past 10 years. The performance and ease of maintenance of fiberglass vessels suggests that there will be

a trend toward increasing use of this kind of boat in the future (Acheson *et al.* 1978:57). Although there are some variations in design, there are certain common features distinguishing the "Maine lobster boat."* These features adapt the vessel specifically to the requirements of lobster fishing. Such a boat has a high prow, which makes it relatively seaworthy when it is headed into the wind. A low stern and sides behind the cabin minimize wind action when the boat is broadside, and facilitate the handling of traps. Some boats have a small mast near the stern to allow use of a sail on windy days. A sail helps keep the boat headed into the wind when it is not under power, and reduces the motions caused by heavy seas, thus providing a more stable working "platform" for the fisherman.

Lobster boats are powered by inboard marine engines or automotive engines converted for marine use; diesel engines are coming into increasing use. Hydraulic trap haulers are almost universal on inboard powered vessels. Their adoption since the early 1950's has meant a major change in the industry. Such a hauler allows an individual to fish many more traps since less labor is required and he can therefore pull more traps in a given time period than he could by hand.

Other typical on-board gear today includes a CB radio, depth finder, and, increasingly, smaller radar units for use in foggy weather. Beside aiding navigation and increasing safety, electronic gear has allowed the lobsterman to gain a better knowledge of bottom types. Such knowledge can be a help in trap placement for a skilled and experienced individual.

Since lobster boats are intended as inshore, day-fishing vessels, they rarely have bunks, stoves, toilet facilities, or even fresh water on-board. Furthermore, they are designed in such a way that lobstering may be carried on as a single-man operation. Only in areas of the coast where large numbers of traps are fished by a boat owner are helpers, or "sternmen," used regularly. In a few other areas, a second man may be added during the more dangerous winter season when boats are fishing further offshore.

Traps.** Fishing technology along the entire length of the Maine and New Hampshire coast is relatively uniform. While metal traps are being adopted in a few areas (see discussion below), the vast majority of lobsters are caught in wooden traps or "pots." Such traps have flat bottoms, and may be rounded top or square. The vast majority of traps are three to four feet long and are constructed of oak frames covered with hardwood lathes. Lathes are placed about 1.5 inches apart, which allows free circulation of sea water while still retaining larger, legal-sized lobsters. In Maine, by state law, each trap must now be fitted with a "vent" to allow undersize lobsters to escape. The open end (or ends) of the trap contains a funnel-shaped nylon net or "head," which allows lobsters to get in but makes it difficult for them to escape; larger traps are equipped with an extra internal head, ("parlor head"), which ostensibly allows for less escapement. Inside the trap, the lobsterman places bait, which usually consists of fish remnants obtained from nearby processing plants, but sometimes fresh bait such as alewives.

Squared (rectangular) metal traps are being used in a few places (some ports in Casco Bay, in Muscongus Bay, and in Stonington, all in Maine). These are built of vinyl-coated or galvanized aluminum "wire," and are more expensive than wooden traps. There is some evidence that for skilled men in some areas the original style metal traps fished better than wooden ones; the galvanized did slightly better than the vinyl (Acheson 1980).

However, as of this writing (1980), some fishermen report that the wire being used now is inferior to that originally used by the trap manufacturer and that the newer corrode so that they not only

*Discussion on design features and gear of lobster boats is here summarized from Acheson *et al.* (1978:56-60).

**Discussion of lobster trap technology is summarized from Acheson (1975a:184-185) and Acheson (1980).

wear out very fast, but don't catch lobsters in the process. There is substantial evidence these complaints are grounded in fact (Acheson 1980). Metal traps do have some advantages over wood (e.g. lighter and easier to transport, not subject to worms and rot, etc.). However, they are more expensive, and since there are currently problems with some types of wire used, the adoption of this innovation may be in the process of slowing down.

Traps (whether metal or wood) are attached to styrofoam (or, rarely, wooden) buoys by means of a nylon or hemp rope ("warp"). Each buoy bears the distinctive colors of the fisherman, which must be registered with the state. In most areas, one or two traps are attached to a single buoy ("fishing singles" and "fishing doubles"), but in some areas it is customary to attach six to ten traps to one warp. When "fishing trawls" in this way, the Maine fisherman often lays his traps in a roughly north-south axis; only the ends of the lines are marked with buoys, rather than each individual trap. Whether fishing singles or trawls, the fisherman normally places traps in the water in "strings" or long rows; this enables him to see from one buoy to another in the fog. On good days, a good fisherman operating alone and fishing singles or doubles might pull about 200 traps. One who is fishing trawls and has a sternman might easily pull 350. Traps may be pulled every day or two in the summer when the weather is better and lobsters are more active. In winter because of bad weather and a slowdown in activity of the lobsters, traps may only be pulled once a week.

The total number of traps fishermen use varies tremendously up and down the coast. It is meaningless, therefore, to talk about a "typical" lobster fishing operation. Excluding part-timers, we can make a few generalizations about areal variation in trap numbers.* From New Hampshire to about Cape Elizabeth, Maine, a typical operation may use 350 to 500 traps, which are mainly fished in doubles. Sternmen are not common, and almost no one employs one year-round. In Portland and the adjacent Casco Bay region, larger groups of traps are the rule. A few fishermen may have 2500 traps, fishing trawls, but the average is probably in the 1000 or 1200 range. Almost all these boats have year-round sternmen. From Casco Bay to South Bristol, a large amount of lobster fishing is also carried out with traps set in trawls. However, the number of traps in each operation is smaller, usually 500 to 700 per boat. Sternmen are fairly common, but not all boat owners employ them year-round. From the Pemaquid area to the Canadian border, an average operation might have 350 to 400 traps, mostly fished in doubles. Sternmen are sometimes used on larger boats, especially during the winter or at very busy times, but use of sternmen is much less common than it is in the Casco Bay region.

Dredging

Scallops are caught by metal dredges towed from a boat, and mussels may be harvested in a similar manner.** There are several size dredges, with three or four foot ones being most common on in-shore Maine boats. Larger scallop boats, especially those which operate off-shore, use dredges from 6 to 10 feet wide. Scallop or mussel dredging is normally done over the side. It can also be done over the stern. Normally, two dredges are used in scalloping. As one dredge is hauled in, the other is put out, so the boat can continue to drag while the previous haul is being removed and the mussels shucked. A winch is used to haul back the dredge. Large scallop boats which stay out for a number of days are equipped with a shucking house, where scallops are shucked and stored under refrigeration or frozen.

The inshore scallop and mussel fishery utilizes boats in the 35 to 45 foot range, which are frequently also used in lobstering or groundfishing. Many such boats are rigged for scalloping or

*To some extent areal variations are codified in state laws. In Maine, no more than three traps may be placed on a single warp and buoy in the following areas: (1) west of Cape Elizabeth and east of Kittery (2) between Pemaquid and Robinson's Point (Isle au Haut), and (3) off Hancock County. No more than ten traps on a single warp may be fished in the Kittery vicinity (Maine Marine Resources Laws and Regulations, Revised to Sept. 14, 1979).

**Mussels are also harvested by hand, using rakes or hoes.

mussel dredging as a secondary, seasonal fishery. Such a boat usually makes use of already existing equipment, for example, electronic gear, winch, etc., adding only booms and dredges when it rigs up for scalloping. These inshore boats go day tripping in their local area. Off-shore scalloping takes place in larger boats, generally over 45 feet, that stay off the coast overnight or for days at a time. Since offshore scallop vessels have more extensive equipment (especially the shucking house, which entails a hull modification), it is much more difficult for such vessels to switch to other fisheries.

Hand-harvesting

Clams and marine worms are harvested by hand, using forks, or "hoes," as they are often called. Some clambers and wormers use outboard-powered skiffs to reach areas inaccessible by land. An average skiff used by a clammer or wormer would be in the 14 to 16 foot range, with a 10 to 40 horsepower motor. Other equipment would include a pail or box for worm storage, clam hods (a slatted wooden box for rinsing and carrying clams), perhaps lighted headgear for wormers working at night, hip boots, and a vehicle for reaching the flats and transporting gear.

Digging techniques are somewhat different for bloodworms, sandworms, and clams, but harvesting all three species requires strength and endurance to stoop for the long hours of the low tide period.

Bloodworm diggers follow the tide. As the receding tide begins to expose the mud flat, diggers follow the tide out with a three foot wide trench. On the average, a digger harvests one bloodworm for each four or five turns of the hoe. Bloodworms live fairly near the surface. When the tide comes in, the digger reverses direction and digs toward the shore.

Sandworms are best found at the lowest low water mark. Thus, the sandworm digger generally waits until the tide is near low water mark and then digs in an area parallel to the water line, often to a depth of eighteen inches. A good flat will produce one to four commercial sized worm(s) for each turn of the hoe. On dark, damp nights sandworms appear on the surface. Diggers, using a head flashlight, use split-second timing to grab the worms as they surface.

Clam diggers use two slightly different digging techniques (Welch 1979:18). Where clams are not very deep in the flat because of hard sediments, the clam hoe, which is actually a four to five tined, short-handled fork, is pushed into the required depth to break out a solid chunk of flat which is tipped upside down into the previously dug area behind it. The clams are then picked off the underside of the chunk. The second method is more common, and is used where clams are burrowed deep in muddy or sandy sediments. In this technique, the top layer (about three to five inches) is first taken off into the previously dug hole. Then, a deeper chunk of flat containing or exposing the market-size clams is dug. Both methods result in the burying of many of the remaining clams; small clams buried in the manner are estimated to have only a fifty percent chance of survival (Welch 1979:18). And even clams which are not buried stand a good chance of being broken by the tines of the clam hoe.

The hydraulic clam harvester, widely used in Maryland, is not used in Maine for commercial harvesting. Two towns have used a hydraulic digger to transplant small clams, and the Department of Marine Resources may use the hydraulic digger occasionally for studies and projects.

Digger productivity shows a good deal of variation, depending on skill, season of the year, area being dug, and intensity of digging efforts. An average to excellent Maine clammer can dig three to six hods (one and half to six bushels) on a tide, which would be a four to six hour period. Figures supplied by Dana Wallace of the Maine Department of Marine Resources and from other Department of Marine Resources sources such as license lists suggest that an average full-time Maine digger would produce 1.75 bushels/tide; would work about 100 primary tides plus 20 second tides per year; and would produce about 210 bushels per year working at this rate.

Seasonal Cycles and Fishing Areas

Groundfish and Redfish

The Maine and New Hampshire groundfish fleet operates mainly inshore and on some of the closer offshore banks such as Jefferies Ledge, Cashes Ledge, and a few farther off on Georges Banks and, in the past, Brown's Bank. With the exception of the "redfish fleet" and a few of the larger draggers, boats are operating on a "day trip" basis or are staying out at most one or two days. The map (Figure 1) in Chapter 2 shows major fishing grounds used by northern New England groundfish boats, as well as some of the areas formerly but not currently being fished (e.g. Brown's Bank, which is now closed to U. S. fishermen since it is within the 200 mile territorial zone claimed by Canada).

Redfish vessels are large, off-shore boats and normally operate year-round. In recent years, due to the closing of Canadian areas to American boats, there have been periods when some redfish boats have had to remain in port. To compensate for the decline in redfish availability, these boats have been increasingly going after other groundfish such as cod, hake, etc.

Most groundfish boats in Maine and New Hampshire do not fish very much in winter, from about the end of December to mid-February. The fish are in deeper water at that time of year, and poor weather conditions keep smaller boats in port. Beyond this, the timing of the seasonal cycle and the species sought varies from one area of the coast to another. Generally speaking, the season is about two months later in eastern Maine than it is in western Maine and off New Hampshire and Massachusetts. For example, in the central and western coastal regions of Maine and off New Hampshire, groundfish boats operate about 5 to 20 miles from shore from about mid-February until April. In this region, the first species to begin moving closer in shore in the spring are cod and haddock. In the later spring, there is a heavy admixture of flatfish. Following the fish, boats would be operating here three to four miles offshore by April and May. Most groundfish species which Maine and New Hampshire boats pursue are in fairly close during the summer, though in the eastern part of the coast, as mentioned above, the season is about two months later. Off New Hampshire and Maine's mid and west coast, by mid-summer the species mix shifts to a greater proportion of hake, pollock, and whiting, while haddock and cod predominate again in the fall.

For groundfish boats which shift into other fisheries, the seasonal cycle is somewhat different. If a boat is purse seining for herring, it normally makes the switch to this in about April or May and continues fishing herring to early fall (September, or October at the latest). Scallop fishing would be done during the winter, when little groundfishing is done anyway. Swordfish would be pursued in July and August, and lobster in August, September, and October. Very few people who are mainly in groundfishing switch to lobster. However, a fair number of lobstermen do at least a little groundfishing.

Herring

Herring fishing is concentrated in the mid and east coast regions of Maine. Fixed gear operations (weirs and stop seines) are found almost exclusively in the eastern Maine region, since this is the area where juvenile herring come inshore and can most easily be trapped in bays and coves. Purse seiners in 1978 had home ports from Boothbay Harbor eastward. Most of these vessels are relatively small, and operate inshore, in the juvenile fishery, fairly close to their home ports. A few larger purse seiners, along with the pair trawlers, fish as far away as Massachusetts and Georges Bank when they are pursuing primarily adult herring. Normally, they fish out of Portsmouth, N. H. or Gloucester, Massachusetts when they are fishing in the more southerly waters.

The fishing season for stop seines and weirs is about May to October, with the peak season varying somewhat from area to area. Since stop seine and weir fishing is sporadic in nature, owners of such operations and their crews normally have alternate income-earning activities even during the herring season. Many do lobstering, clamming, or other inshore fishing, which can be easily dropped if fish enter the cove where the weir or stop seine is located. However, someone must be available to check the cove daily, and to keep track of local herring concentrations and movements. During the off-seasons, those involved in herring stop seining and weir fishing often

continue with other fishing activities.

The purse seine season for juvenile herring in inshore Maine waters is about the same as for fixed-gear operations. However, a purse seiner or pair trawler is much more flexible than a fixed-gear operation. Such a vessel can pursue herring wherever they may be along the coast. Thus, owners and crews of purse seiners and pair trawlers work full-time in the herring fishery and do not carry out any other kinds of fishing at the same season as can those involved in the fixed-gear operations.

Large purse seiners and pair trawlers go for adult herring in waters off Massachusetts during the cold months when juveniles are absent from Maine waters. Most will also switch to otter trawling for groundfish during seasons when herring are scarce. Normally, they fish out of Maine ports when they are going for groundfish. The smaller purse seiners do not usually take part in the adult fishery, but switch to scalloping, lobstering, or groundfishing near their home ports. Normally, smaller crews are needed for these fisheries than for purse seining, so some of the crew members on these smaller vessels engage in other kinds of fishing using their own boats or seek on-shore employment during the seasons when purse seining is not being done.

Lobster

Lobstering is distributed more evenly along the Maine and New Hampshire coast than any other single fishery. There are literally almost no ports where other fisheries are carried out where there is not also some lobstering. As we shall see in the port studies, there are a fair number of ports where lobster is the only fishery. Lobster fishing is governed by a unique system of ocean territoriality, which will be discussed below in the section on social features of the harvesting sector.

The seasonal cycle of activity for a full-time lobster fisherman depends on: biological cycles and behavior of the lobsters, weather, the size of his boat, and his involvement in other fisheries. In the past, when smaller boats were the norm, many fishermen did not fish in the winter months when the seas are rough and lobsters are best caught fairly off-shore (three to ten miles in many areas). Today winter fishing is more common, but is by no means universal. Shedding season marks another period of relative inactivity in lobster fishing. Fishing is so poor at this season that many fishermen use this time to take their boats out of the water for yearly maintenance and repair.

It is difficult to describe a typical fishing operation since there are so many local variations. However, for many lobstermen the yearly cycle would be as follows:

Summer, following shedding season, about mid-July to mid-August is a period of high activity in lobstering. The weather is good, lobsters are active, and they are reported to be "hungry" after shedding (hence more likely to be trapped). Also a new group of lobsters has just molted into the legal size, increasing availability. Prices, however, are usually relatively low, and soft shelled lobsters do not command as high a price as hard ones. Furthermore, summer is the season when there is the greatest amount of trap congestion, since this is the time when most part-timers and skiff fishermen are operating.

Fall and early winter (about October to December) is usually the most productive time of the year in lobstering. Catches are usually good and prices begin to rise after their summer lows. However, the weather is often bad and boats must move further off-shore. Storms are more frequent, and can prevent the fisherman from tending his traps or can result in big financial losses due to trap loss and damage. Those with smaller boats are often not able to go out much after November. Those who do not fish at this time of the year would use this time for making and repairing traps and other gear. In the eastern part of Maine, some fishermen seek late fall and early winter employment working in the woods cutting pulp.

Winter and early spring (about January to early April) is the worst season for lobstering for three reasons. First, the weather is very bad so fishermen are often not able to go out. Second, lobsters are quite inactive during this cold season. Finally, a very large proportion of lobsters which molted into legal size the previous summer have already been caught. Many people do not fish at this season, even those who had gone out in the earlier part of the winter, but

rather devote their time to building traps and repairing gear. However, those who operate year round have increasingly been turning to other fisheries, especially dragging and gillnetting groundfish or scalloping. As people have begun to use larger boats which enable them to fish in winter, they have had a larger capital investment and can therefore not afford to keep their boats idle. Hence, scalloping or groundfishing are increasingly attractive alternatives when lobster fishing slacks off.

Spring (April to about mid-June depending on the area) was formerly a fairly good season in the lobster fishery, since weather improved and lobsters became more active as they began to move inshore in preparation for shedding. Since about the mid-1970's, however, fishing at this time of year has been very poor since most legal size lobsters have already been caught.

Scallops

Although sea scallops may be found in most large estuaries and bays, the major inshore commercial areas in Maine are Penobscot Bay, Bluehill Bay, Harrington and Addison Rivers, and the Jonesport Area (Baird 1967:3). Although they are found far offshore, especially on Georges Bank, only a few Maine fishermen venture out for the many days required to fish that far out to sea. There were no scallop fishermen in New Hampshire in 1978.

The inshore scallop fishery in Maine is restricted legally from the first of November to the fifteenth of April. The offshore fishery does not have seasonal restrictions, but Maine has only a few boats that go scalloping year-round. Most of those boats that do fish year-round spend the summer and fall fishing off Cape Cod, returning to their local areas by November first. Most of these boats do not go far offshore, but operate near their home harbors during Maine's open season. Only a few go offshore, and even these sometimes operate closer in when Maine's season is open.

As previously noted, many of the vessels in Maine's scallop fishery switch into scalloping during off-seasons in other fisheries. The open season for scallops coincides with the months when lobstering is at its low point because of weather conditions and lobster availability. The vast majority of short-term, seasonal scallopers in 1978 were lobstermen; a few were mainly in herring, groundfishing, or a combination of fisheries (e.g. lobster, herring and scallops, or lobster, groundfish, and scallops).

Clams and Worms

Worm harvesting is a highly localized activity. In 1978, full-time worm diggers worked only in Lincoln, Hancock, and Washington counties, Maine. Even within these counties, worms were harvested in only a few towns.

Clam digging is a more widely distributed activity, but tends to be concentrated in the eastern part of Maine. It is not just that the potential clam flat areas are more extensive in this region, but also that pollution is heavier in more westerly regions, which leads to flats in these areas being closed more often. Walter Welch from the Maine State Department of Marine Resources reports that in Maine, York, Cumberland and Sagadahoc Counties (i.e. the west coastal region) include some 24 percent of the state's total growing area for clams (Welch 1979:6). However, because of pollution problems, the areas of these counties actually open to digging constitute only 17 percent of the state's total growing area. The small counties of Lincoln, Knox, and Waldo include 18 percent of Maine's total growing area, with the areas open to digging being 13 percent of the state total. The eastern counties of Hancock and Washington comprise 58 percent of the total growing area, while the open area is some 53 percent of the state total (*ibid*). Over the past 15 years, Walter Welch notes, Hancock and Washington Counties have supplied well over 50 percent of the total clams marketed in Maine.

Clam and worm digging is primarily a warm weather activity. This is due partly to the behavior of the various species, partly to accessibility of the flats, and partly to economic factors.

The worming season begins around April. By August, the worms burrow deeper to keep cool in the mud. Harvesting becomes more difficult, and for some diggers, digging is not worth the time for

the amount of money involved.

Most upper estuarine areas in Maine are frozen over in mid-winter, and even areas around islands and on points of land are subject to winter's severe storms, which greatly limit clamming and worming activities. Thus, in most areas of the coast, there are very few people who go clamming or worming during the coldest winter months. For those who do, clam prices are at their highest at this season, and it is possible for an individual to earn quite a high income clamming if weather conditions permit adequate digging time. For most serious clammers, and certainly for most part-timers, clamming activity like worming would begin in earnest around April, and would continue until about September.

Market conditions are such that demand for clams is highest during the summer tourist season, and lowest during the winter. Prices, however, are related more to clam supply than to demand. Prices are highest in the winter, in spite of the reduced demand, because the weather puts serious constraints on clamming and the supply is consequently very low. In summer, good weather conditions, along with certain economic factors, brings large numbers of clammers to the flats, with a consequent rise in supply. Thus, prices offered by dealers fall in the summer, even though this is the peak demand period.

Seasonal activities of clammers cannot be explained solely by environmental and market conditions. The availability of alternate employment is probably more influential in the clam fishery than in any of Maine's other fisheries. While this will be discussed more fully in the port studies themselves and in the concluding section, it should be mentioned that in most parts of the coast clamming is not felt to be a permanent, year-round occupation the way most other fishing businesses are. Instead, for most clammers, clam digging is an interim or fill-in activity, carried out when the person does not have any other wage-labor or fishing employment. Thus, the seasonal cycle of a clammer varies at least in part because of availability of other work in his area. For example, winter clam digging is more common in the eastern part of the state, where the job market is very poor at all seasons, but especially in the winter. In Hancock and Washington Counties, clamming is frequently combined with other fishing activities such as spring and summer herring fishing, handlining or longlining for groundfish, and work as a sternman on lobster boats; work in the woods in the winter is another frequent activity in this area.



Social Aspects of the Fisheries

For a full appreciation of the data contained in the port studies, an understanding of certain structural and organizational features of some of the fisheries is necessary. Fuller socio-economic data, including statistical summaries, will be provided in the concluding chapter of this volume.

Groundfishing and Redfishing

Most groundfish boats have crews of two to four men, including the captain; a few have as many as five, and the large vessels which go mainly for redfish have six to eleven. Gillnetters normally have larger crews than comparable-sized draggers, since more labor is required to extract the fish from the nets. Three men would be an absolute minimum, and four to five is more common. With a few exceptions, almost all vessels which pursue groundfish as the major fishery are individually owned by their captains.

Crew recruitment on smaller boats which do mainly day-tripping is based to a great extent on kinship and residential ties. A significant proportion of crewmen on these boats are related to the captain and/or one another. Kinship ties through the male line (agnatic ties) are the most common, but recruitment through the female line or in-laws can also be found. Residence is an even stronger factor in crew recruitment: captain and crew almost always come from the same town or closely adjacent ones. On larger boats (such as the redfish fleet and larger draggers) kinship and residence are not as important in influencing crew composition. Nonetheless, a survey of 190 groundfish boat captains from Maine and New Hampshire revealed that crew members, with only two exceptions, came from the boat's home port or from towns within a 15 mile radius (Acheson and Lazarowitz 1980). (This sample did not include the redfish fleet.)

Maine's redfish industry is unlike that of any other fishery in the state. Virtually all of the redfish landed in Maine are caught by eleven boats owned by two large, vertically-integrated companies, one in Rockland and the other in Portland. The large crews work year-round on the company-owned vessels.

Herring Fishing

Crew size, composition, and recruitment vary depending on the gear type. Carrier vessel captains are usually men who have been with the sardine company for many years, and who are extremely proud of their vessels and their work.

Stop seine and weir crews are recruited in similar fashions to one another but the crew size varies. Normally, a stop seine or weir is owned by one or two people, who sometimes own other weirs or have other stop seine berths. When herring come in, extra crew members are called in. Normally, a weir would require at least two to three people to operate, and usually more, while a stop seine operation needs at least four and may go up to eight or nine. (The size of the cove, amount of gear, and amount of fish are the factors affecting needed crew size.) Those called in as crew usually have a long-standing agreement with the owner. They must be free to drop what they are doing on short notice to join the crew when herring enter the area. Frequently, many of the crew are kinsmen of the owner, including in-laws.

Crew size on purse seiners varies from three or four on the smallest boats to eight or nine on the larger ones. Crew members usually stay on for at least a whole season. More permanent crew are apt to be a kin-based nucleus, with others coming on a season-by-season basis.

The pair trawlers usually have a four man crew per boat, but the composition of these crews varies somewhat, depending on whether the boats are company-owned or family-owned. This is described further below in the studies of the ports of Rockland, New Harbor, and Boothbay Harbor, where pair trawlers were located in 1978.

Given the high degree of coordination and cooperation necessary for pair trawling, it is not surprising that these operations are structured as they are: two are company boats and two sets

of boats are owned by families. All these boats are in Maine; no pair trawlers hailed from New Hampshire ports in 1978.

A rather unique aspect of the Maine herring fishery is the social structure of weir and stop seine ownership and operation.* Since weirs are semi-permanent structures, their erection involves certain institutional procedures. Approval for weir construction is needed from the Maine State Environmental Protection Agency and from the Army Corps of Engineers; a commercial fishing license is required; and the town in which the weir is to be located must approve the plans. Technically anyone may build a weir if these steps are followed. Practically speaking, the need for local approval serves as the major force influencing who may build a weir and where. It is at this level that most of the controversy and "politicking" are apt to occur. Normally, a person who comes from an "old family" in the town, who has a lot of local kinsmen, and whose family has traditionally been involved in herring fishing is the most likely to build a weir. He must also usually have shore property or access to it. Finally, since weir-building is a labor-intensive operation, a man who can devote a lot of his own time to construction and who has willing kinsmen to help will be in a much better position than a person who uses only hired labor.

Stop-seining also involves the ability to manipulate kinship ties. Normally, a person inherits what is known as a "berth," the right to stop off a particular cove or bay. Usually, the family owns or has owned shore property on the cove. (As increasing amounts of shorefront have been bought by "summer people," many families or individuals with stop seine berths no longer own the actual land around the cove.) A "berth" is really a usufruct concept. The "owner" of a berth must keep a dory and seines in the cove to be ready if herring enter and to maintain his claim to the cove. If fish come in and the owner does not stop them, someone else may come in and purse seine them or even set up his own stop seine. If the owner so desires, the berth may be passed to someone else, kinsman or non-kinsman. Under ordinary conditions, if a person keeps a dory in the cove and stops it when herring enter, no one else will move in, though there is no formal law prohibiting it.

Lobstering

Most lobster boats are operated by owner-skipper who work alone. Only in areas where large "gangs" of traps are run would a sternman be used on a regular basis. In other parts of the coast, a sternman might be taken on during an especially busy time (e.g. fall) or during the dangerous winter season. The trend to larger boats, larger numbers of traps, and a longer fishing season has led to an increase in the use of sternmen. Good sternmen are difficult to find, especially given the value most lobster fishermen place on independence. A man would much prefer having his own boat to working with someone else. Usually, a given sternman would not stay with a boat owner for more than one season, but occasionally a sternman may stay longer. Often, the sternman is a young boy--often the lobsterman's son or other close relative. Boys who are in school, of course, can only help out in the summer and during vacations. And, in many cases, boys operate their own skiffs rather than, or in addition to, serving as sternmen.

Most sternmen are paid on a modified "shares" system, whereby the greater the catch, the more the sternman earns. A common arrangement is for the sternman to receive a set wage per day or \$10.00 for each 100 pounds of lobsters caught, whichever is greater. Some are paid on a straight shares system, with no guaranteed daily minimum. Whatever the arrangement, a sternman would rarely take home more than \$40 to \$50 a day in 1978-1979. (Given the "shares" system, it is usually to the sternman's advantage to work with a skilled "highline" fisherman who brings in large catches.) It should be stressed that sternmen are not considered employees and do not consider themselves as such. Traditionally sternmen were considered self-employed. Recently, U. S. tax and social security rulings attempted to define the sternman as an employee. This effort has been defeated so that sternmen are again allowed to declare themselves as self-employed, as the boat owner is.

*This discussion applies only to Maine, since environmental circumstances do not allow for weir or stop seine herring fishing in New Hampshire.

Territoriality and "harbor gangs". Legally, anyone who has a state license can fish for lobster anywhere. In actuality, as Acheson has described (1972; 1975a; 1975b; 1977), far more is involved. A would-be lobster fisherman must be accepted by the lobstermen working out of the harbor from which he wishes to fish. Once he has gained admission to such a "harbor gang" he would ordinarily be allowed to fish only in the traditional territory of that group.

In the past, before the advent of motorized lobster boats, the men from each harbor maintained distinct fishing territories in and near their harbors. Territoriality has changed somewhat since the advent of electronic gear and larger motorized boats, but it is still a very important and unique aspect of the social organization of lobstering in both Maine and New Hampshire. Acheson (1975a:193ff) has described the origin and the economic and biological effects of territoriality in Maine lobstering. He notes that territoriality today takes two forms. First, men fishing around Maine's outer islands (such as Monhegan, Matinicus, etc.) still maintain the older type of distinct territories. These "perimeter-defended" areas have sharply defined boundaries, which are defended by the men fishing the areas. Second, and more common are "nucleated areas." In these harbors (which are primarily mainland ones in both Maine and New Hampshire), there is a strong sense of "ownership" close to the harbor mouth; usually an area within two or three miles of the harbor is maintained exclusively for people fishing from that harbor. However, in this instance there is no sharply maintained boundary. Acheson notes (1977:120): "Far from the harbor mouths there is a good deal of 'mixed fishing' so that sometimes men from as many as five harbor gangs are fishing together." (This is especially true in the fall and winter when people are fishing farther from shore.) Acheson stresses that "This territorial system is entirely the result of political competition between groups of lobstermen. It contains no 'legal' element" (Acheson 1977:120). In other words it is an "informal" system, not based on State or Federal law.

The territorial system is based on shared values, and is supported by both verbal and physical means. Interlopers are strongly sanctioned, usually by the destruction of some or all of their gear. Occasionally (perhaps once a decade, according to Acheson), small incidents may escalate into a full-fledged "lobster war" with dozens of men involved and widespread gear destruction (1977:118).

The territorial and "harbor gang" system, far from being a quaint relic of the past, is an important organizational feature of the lobster fishery in this part of New England. The group fishing from a particular harbor forms a significant social unit. Besides helping to maintain a territory and control entry into fishing, the harbor gang is also a source of social control, a reinforcer of fishing norms, and a source of information. The territorial system itself can have important economic and ecological effects. For example, Acheson found that there were far fewer men per square mile of fishing area in perimeter-defended territories, since it is much more difficult to gain entry into the "harbor gangs" maintaining such areas. He also noted that men in most perimeter-defended areas have self-imposed conservation measures. The difference in exploitation rates in the nucleated and perimeter-defended areas clearly leads to differential economic and biological effects, according to Acheson (1975a). He found that men in perimeter-defended areas catch larger lobsters and more pounds of lobster per trap than those fishing in nucleated areas, and they earn higher incomes.

Scalloping

Average crew size on an inshore scalloper in Maine would be two to three men. Larger boats, up to about 60 feet, would have four to six crewmen, those in the 60 to 70 foot range about six to eight, and the very largest (those over 80 feet), eleven to thirteen. Because of the labor involved in on-board shucking, scallop boats have larger crews than a comparable-sized dragger would. Crewmen on smaller vessels or those which fish only during Maine's open season are very frequently lobstermen who are not fishing their own boats during the winter and early spring season. There is no great degree of crew continuity from one season to the next on small vessels, though sometimes a person who has served as sternman on a lobster boat will stay on as crew during scalloping. Crew recruitment on smaller, day-trip vessels that only fish during Maine's open season is not as great a problem as it is for the larger vessels that go offshore or for those which go to Massachusetts during the summer and fall. Crewmen on such a boat must be able to put up with cramped living conditions, the frictions of living with a small group of people

for days on end, and, in the case of boats fishing off Massachusetts especially, long periods away from home.

Investment

Some overall figures on average investment in the various fisheries is provided here. These figures are as of 1978, when the port studies were carried out. Absolute figures, of course, quickly become outdated because of general inflation and because of technological changes which lead to new kinds of gear being adopted. However, these figures will give the reader at least some idea of the relative costs of starting new fishing operations of various sorts in the base-line year of 1978.

Groundfish

Costs of a new fully-equipped groundfish boat have risen greatly in recent years. A 55 foot wooden boat (for dragging or gillnetting) in 1978 would have cost about \$135,000 minimum, fully equipped except for nets; somewhat larger boats with more extensive electronic gear could easily cost \$180,000. A new otter trawl net and accompanying doors and cable in 1978 went for \$6-8,000 (assuming a 60 foot net, measured along the bottom line). A dragger normally has three to four otter trawl nets, though only two would be on board at any time. Gillnets come in twenty fathom (120 foot) lengths, about three to five fathoms (eighteen to thirty feet) deep. A single gillnet in 1978 cost about \$140.00; a gillnetter is usually equipped with about twenty at any one time. In terms of replacement, an otter trawler might need to purchase one net per year, while a gillnetter might have to replace five or six per year.

Herring

In terms of capital investment, stop seining is probably the least expensive operation and pair trawling the most. However, investment in fixed gear operations is risky, since there is no way of being sure that herring will enter the cove.

Approximate costs of a brand-new operation as of 1978 were as follows:

1. Weir: \$25,000 (plus cost of dories, which would be the same as for stop seining).
2. Stop seine: New dory \$1800 (normally at least two). Nets (assume 200 fathoms, or 1200 feet) \$7-\$8,000. If the cost of the larger boat used in stop seining is included it becomes more expensive than weir fishing. However, since these larger boats are normally used for other kinds of fishing, costs would have to be apportioned over the various fisheries the owner engages in.
3. Purse seiner (assuming a fully-equipped, 50 ft. vessel, including electronics): \$100,000 to \$150,000; purse seine net (200 fathoms or 1200 feet) - \$10,000.
4. Vessel used for pair trawling (90 ft., steel, fully-equipped, including nets) \$500,000 to \$750,000.

The herring industry, unlike any other Maine fishery except redfish, has a marked degree of vertical integration. Canning companies own the carriers, as well as two of the pair trawlers and several purse-seiners. Even in operations that are not technically company-owned, a major portion of the financing may come from long-term, no interest company loans. It is a system in some ways more akin to sharecropping than to conventional financing. For example, if a company has financed a weir or stop seine, herring catches are apportioned with anywhere from 15 percent to 33 percent of the fish going directly to the company. The remaining portion is sold (normally to the same company), and the owner and crew split the proceeds. A fairly common arrangement would be: one-third to the company that gave loan, one-third to the owner(s), and one-third to the crew. Payment to the company is only required when fish are caught.

Scallops

It is rather meaningless to give total start-up costs for the majority of the scallop fleet, since these boats are involved primarily in other fisheries. In 1978 it would have cost about \$4000 to equip an existing lobster boat with the winches, boom and dredges necessary for an inshore scallop operation. In that same year, again excluding the cost of vessel, engine, and electronics, costs for rigging a larger boat for overnight or off-shore scalloping would have ranged upwards of \$30,000 for shucking house, freezer or cooler or both, extra boom and winches, and the larger dredges. Costs of the vessel, engine and electronics for one of these larger operations would be about the same as for a comparable-sized otter trawler.

Lobster

Individual investment in lobster fishing has gone up greatly in recent years because of inflation and because of the move to larger boats, more sophisticated electronic gear, and increasing numbers of traps; in some harbors, the shift to more expensive metal lobster traps has added to the fisherman's cost.

In 1978-79, if a man wanted to completely outfit himself from scratch for full-time lobstering, average costs of gear would be approximately as follows:

| | |
|--|---------------|
| Boat (wood, 35-38 foot, fully equipped with pot hauler and electronics) | \$30,000 |
| Traps (wood, fully equipped with heads, warps, buoys, about \$30.00 each; 500 traps) | 15,000 |
| Truck, Dock, Workshop, Tools (approximately) | <u>30,000</u> |
| TOTAL | \$75,000 |

This assumes that all of these items would have to be purchased. In fact, a high proportion of fishermen in Maine and New Hampshire construct their own traps during the off-seasons. And, obviously, in areas such as Casco Bay where much larger numbers of traps are fished from large boats, individual investment in fishing would run much higher. If a man purchased metal rather than wooden traps, costs would also be higher since ready-to-go metal traps in 1978 ran about \$35.00 each.

The wooden traps last, on the average, about five years, and may go up to seven, while metal ones last only about three to four years, five at the most. If a person does not fish at all seasons, his traps may go somewhat longer, especially if he does not fish during the rough winter season. If he does fish in winter, trap losses and damage are somewhat greater. On the average, a full-time fishermen would have to replace about 20 percent of his traps each year to cover lost, damaged, and worn out ones. In any case a fisherman has to go over all his traps every year and do repairs and maintenance on most.

Clams and Worms

Basic technology in the clam and worm industry is simple and inexpensive, requiring the lowest investment levels of any fisheries carried out in this area. Costs of digging gear and clothing are minimal, and auto or truck transportation can be provided by the family vehicle, with perhaps the addition of a trailer hitch if the digger uses an outboard skiff. A pickup truck is the preferred vehicle, and might be considered "basic" equipment on the basis of fishermen's values and preferences, even though a car with a large trunk is perfectly adequate for transporting equipment and dug clams or worms. An average skiff might be made of aluminum or wood, in the fourteen to sixteen foot range, with a ten to forty horsepower outboard motor, and a trailer to tow it; investment in such an operation would have been around \$2500 in 1978. A fancy fiberglass speedboat with an outboard up to 175 horsepower could easily be as high as \$8,000. Like the fast, shiny, new pickup truck, such a boat is not necessary for successful clam harvesting, but there is no doubt that ownership of these kinds of gear brings prestige. As a result, the capital owned by

individual clammers and wormers varies a good deal, in spite of the fact that there is little variation in the basic technology or equipment needed in these fisheries.

Marketing and Processing

Groundfish

Much of the groundfish landed in Maine and New Hampshire is eventually sold to dealers in the New York and Boston fresh fish markets, but an increasing amount is being processed locally and shipped to other markets in fresh or frozen form.

At the present time, probably the majority of groundfish destined for the fresh fish market are sold through a trucker-broker operation. In this system, a trucker picks up the catch at the dock in a refrigerated truck, and transports the fish, usually to Boston, where they are sold by a broker. The price received is usually set by the auction. The trucker, broker, and auction (if the fish are sold there) each receive a flat fee for handling the fish. The catch is not actually purchased by the trucker or broker, but remains the property of the boat owner until it is sold at auction. Any loss, spoilage, etc. must be borne by the fisherman, who only finds out days after the catch is landed how much he has received from it.

Local Maine processors in Portland, Rockland, and Prospect Harbor have been handling increased volumes of Maine groundfish which are processed into fresh fillets or into various frozen products. In this case, the catch is sold directly to the processor and the fisherman knows right away the price he receives. The fish are either landed directly at company-owned docks, or are shipped either by independent trucker or in company-owned trucks to processing plants from more distant ports. If possible, the fisherman tries to land his catch directly to avoid shipping costs.

Fishermen's cooperatives have not become involved in finfish marketing or processing to any great extent yet. Many lack storage, freezer, and ice-making capabilities. Some do act as shippers, or allow shippers to use their docks for handling catches.

Some groundfish are marketed to local dealers for direct retail sales. These dealers do some processing--heading, gutting, filleting. Although statistics are lacking, local dealers and retailers may account for a much larger proportion of the area's groundfish market than anyone has estimated.

Groundfish destined for Boston, New York, or other fresh fish markets are usually only headed, gutted, iced, and boxed. Some of this minimal processing is done on-board vessels, especially gutting and heading for those species marketed without heads (e.g. hake). Icing and boxing for shipment is usually done ashore, although some captains prefer to box on-board. The majority of Maine and New Hampshire boats lack icing or refrigeration.

There are a good many small processing facilities in the area, most of them being associated with or part of small retail establishments. A few of these small-scale processors produce fresh fillets which are shipped to Boston or elsewhere, but most fillets produced by these small firms are sold locally.

The largest processors rely heavily on frozen fish blocks imported from Canada and elsewhere. Achieving a steady supply of locally caught fish is a major problem for these firms, which is one reason why they have turned to imported fish. (Foreign vessels cannot land fresh fish.) Because of heavy government subsidies, imported frozen fish blocks enjoy a price advantage over "native" fish.

Herring

The marketing and processing of herring in Maine is a largely vertically-integrated operation. As was previously noted, harvesters frequently have loan arrangements with processors which require them to market all their fish with that company. Even when no such loan arrangements exist, a harvester usually has a long-term arrangement to sell his catch to a particular company. Some

of these marketing arrangements carry on not only for years but even for several generations. Sometimes there are kinship ties between harvesters and processors, but even when there are not, these long-term arrangements are normally phrased in terms of "first refusal." If a harvester notifies "his" processing company of a catch which the company cannot or will not handle at the moment, he may seek to sell to another company. Normally, a plant operator will try to buy catches from "his" harvesters if at all possible.

A purse seiner or pair trawler can transport its own catch to the plant which has accepted it. If the company-owned carrier vessel is used instead, the harvester must pay a per hogshead fee for transporting the fish to the plant.

Most of the plants in Maine process herring as canned sardines or specialties, but a few are expanding to produce frozen fillets from large fish for the European market. Canned sardines, "steaks," "tidbits," etc. are mainly packed in oil, but some firms produce fish packed in mustard sauce, hot sauce, tomato sauce, spices, etc. Canning sardines, as it is done in Maine, is a labor-intensive operation. The packer (usually a woman), removes heads and tails by hand and places them in a can. In the past, mostly small, one and two year old herring were packed as sardines. During the latter half of the 1960's, canneries began to depend on larger fish (three years old), whose tail ends are packed as sardines. The remainder of the body is used for steaks, snacks, fish meal and lobster bait. Use of large herring for steaking and canning is increasing. The steaking is carried out largely by machine, but the cut herring is still manually placed in cans and the rest of the processing proceeds in the same manner as for sardines and other herring specialties.

Filleting and freezing of adult herring is carried out for the expanding European market. It is a more automated process than the production of canned sardines, and relies on special European filleting machines (Baader or Arenco) which can remove heads, tails, viscera, and backbones of up to one hundred fish per minute. The fillets are packed in thirty pound cartons, plate frozen, and shipped in refrigerated ships to Europe.

Smoking of herring was formerly a much more important part of the industry than it is today. Only a few firms in 1968 produced smoked herring. One produced pickled herring steaks and tidbits.

Herring by-products are used in various ways. Remnants are used in the production of fish meal. Several plants manufacture "pearl essence" a silvery substance used in paints, nail polish, etc. from herring scales.

Redfish

Three firms in Maine process and market redfish. Two of these, O'Hara and Maine Fisheries, are vertically integrated companies whose fleet of boats keep the processing plants supplied. The third, National Sea Products of Rockland, buys frozen blocks (mainly imported) and produces frozen portions of breaded and batter-dipped fish cakes, wedges and fillets. (For further discussion, see port studies of Rockland and Portland.)

Lobster

Lobstermen in Maine and New Hampshire market their catches in four ways: to local private dealers or pound operators; through fishermen's co-ops; directly to local retailers (fish markets, etc.); and by peddling it themselves or having a family member or employee do so. It is almost impossible to arrive at the volume of lobsters sold by this last method. For example, the figure of 20 to 25 percent has been suggested as an estimate of the proportion of Maine's total landed weight which is consumed or peddled directly and which, therefore, does not appear in official catch statistics. Since there has been no solid research on the subject, however, any figures are just educated guesses.

As far as is known, the largest volume of lobsters is marketed to dealers (including pounds and co-ops), with direct retail sales being much less. Besides dealers, co-ops, etc. which buy directly from lobstermen, there are a variety of wholesalers who buy from the primary purchasers for resale to restaurants, retail outlets, institutions, etc.; some dealers and co-ops do their

own wholesaling.

In Maine and New Hampshire almost every sizable harbor has at least one dealer, retailer, or co-op. In order to provide a regular supply of lobsters to wholesalers, restaurants, for retail sale, etc., dealers must compete for the supply of lobsters by trying to "attach as many lobstermen to themselves as possible" (Acheson 1975a:186). To achieve this steady supply, a dealer will typically supply "his" lobstermen with gas, oil, bait, and other supplies at low margins of profit, will allow them to use his dock free or charge, and supply them with liberal credit (*ibid*). Usually, a lobsterman sells to a dealer in his home harbor, though the location of dealerships is not connected to fishing areas. Occasionally, a fisherman may sell to two or more dealers, or may change dealers. However, the usual pattern is for a fisherman to maintain a long-standing relationship with one dealer and to sell his catch exclusively to him (Acheson 1975a:186).

It is important to note that there is very little competition in ex-vessel prices in the lobster industry: "On any given day, all the dealers in the state are paying approximately the same price" (Acheson 1975a:186). However, some dealers do offer a "bonus" or premium price to some fishermen. Dealers compete for the lobsterman's catch mainly by offering him services and credit. Co-ops operate somewhat differently. Although the range of services offered by different co-ops varies, all provide wholesaling and retailing services for lobster marketing, in many instances thereby eliminating middlemen. All offer price advantages to their owner-members. Lobstermen receive the regular dealer price at the time they bring in their catch, and at the end of the year receive a premium, based on their own catch and on co-op operating expenses. Premiums may range from eleven cents per pound down to none at all if the co-op is a new one and is paying off a mortgage. Most co-ops have docks and sell supplies such as gas, bait, etc. Some have refrigerated storage and their own trucking service. Although many have access to credit union service, co-ops do not normally provide credit in the way many dealers do.

Almost all Maine co-ops now have full-time, paid managers. The role of the co-op manager is a very difficult one. To date, few managers have managed to last more than two or three years on the job. The manager is in the difficult business of working for a large group of employers, many of whom do not necessarily see eye-to-eye with him or with one another. Many co-ops hire managers who are quite young, since members feel such a manager will be more responsive and less apt to "tell them what to do." At the same time, a manager is expected to administer the co-op to the best advantage of its members, which means he must have a good knowledge of and ties to wholesaling and retailing businesses, truckers, suppliers of bait and equipment, etc. This, of course, requires experience which many younger managers have not yet acquired.

Besides co-ops, dealers, etc. there is one other important link in the lobster marketing chain, namely pounds. Technically, a lobster pound is an enclosed tidal area, usually a cove with its open side walled in, used for long-term storage of lobsters. For purposes of nutrition and to avoid the spread of contagious diseases, areas with heavy tides to ensure water movement are the ones most frequently chosen for pound construction. Most pounds are owned by dealers or large firms involved in lobster wholesaling. Some pound owners do not buy from local lobstermen at all, but rather from Canadian firms, co-ops, or other dealers or wholesalers. The purpose of pounding is primarily to level the market--to ensure a steady supply of lobsters in the face of seasonal catch fluctuations, and to maintain price levels. During periods of peak supply (and lowest ex-vessel prices), lobsters are pounded, to be sold later when prices rise during the season of lower catches. During the summer, pounds may also be used for storage of soft-shelled lobsters until their shells harden ("hard-shells" command a higher price than "shedders").

Scallops

Scallops are sold shucked, either fresh or frozen. Shucking is done on board the vessel, and all portions of the scallop except the large muscle are discarded. Some effort is made to return the shells to known areas of scallop concentration, in the hope that this will encourage further production because of the scallop's tendency to attach itself to shells. Boats which stay out overnight have either icing or freezing facilities to keep the shucked meats fresh.

Scallops are marketed in a variety of ways. Especially for small or seasonal operations, direct retail sales to local establishments or sales on the dock are not uncommon. Some co-ops, in Hancock and Washington Counties, handle scallops brought in by their members. Local dealers who

handle other seafood, especially lobsters, also take scallops. Finally, there are several truckers who pick up scallops from Maine boats and transport them to Boston to be sold through brokers there.

Probably the majority of scallops landed in Maine are shipped out of state, mainly to Boston, rather than being marketed locally. No Maine processors, at least as of 1978, produced any scallop products, though scallops are breaded, frozen, etc. by companies elsewhere.

Scallops are a high-priced, luxury species. To date, demand has been high and rising. Maine fishermen find a ready market for their catches.

Soft-Shell Clams

Typically a clam digger will sell clams to the same dealer. Nothing, however, obligates a digger to always sell to the same dealer. Clam dealers do not make loans to diggers or give some of them preferential prices for their clams, as some lobster dealers have been known to do. There is, however, a feeling of loyalty and trust between clam dealers and their diggers, so that while diggers technically may sell clams to anyone, they often keep coming back to the same dealer for years on end.

Ordinarily, individual diggers bring their clams to the clam dealer's establishment, where they are inspected and measured in bushel baskets. Some clam dealers are far more lenient about accepting damaged clams than others. No dealer, however, will accept loads with a lot of rocks or mud or with many damaged clams. However, no dealer will insist on "perfect clams" either for fear of alienating his diggers. The clammer is paid immediately for the clams he brings in. Clam dealers used to pick up clams in their own trucks from individual diggers, but this is rarely done anymore.

In the recent past, when there was a glut of clams on the market, buyers used to set production quotas for their diggers. This prevented a complete "layoff," and ensured that regular diggers received at least some income. In the past several years, such "quotas" have been unnecessary. Rather than a surplus of clams, there has been a shortage so that dealers have been able to buy all the clams their diggers have produced at unheard of prices.

Clams are marketed as shellstock, to be used primarily as steamed clams, or are shucked by hand and sold for use as fried clams, and in canned products such as chowders. Currently, about two thirds of Maine's clam landings end up as shellstock, and the remaining one third are shucked and processed further.

Ordinarily, shellstock clams are put in a cooler and sold within a few days. It is very difficult to keep live clams, particularly in hot summer weather, unless they are stored in large tanks with circulating salt water.

Clams are shucked by hand. No machinery is used in the operation. Ordinarily the shuckers are local women. An average shucking house will employ two to five shuckers, although some large operations have employed up to 20 shuckers.

Clams find their way into the market by several different mechanisms. First, dealers based in Massachusetts and Rhode Island (e.g. Bay State) purchase clams along with lobsters at the various dealerships they own. They then ship the clams out of state on their own trucks for sale on the national market. Second, owners of small shucking houses ship clams in their own small trucks to restaurants in Maine which they have agreed to supply. Some of these local dealers also supply clams to food store chains and institutions. None of the owners of small shucking houses take their own clams to markets in New York or Boston, etc.

Marine Worms

Marine worms are shipped from Maine all over the United States; almost none are sold in-state. It is a highly specialized marketing procedure, and Maine dealers who handle bloodworms and sandworms deal only in these species. After sorting (to remove broken or undersized individuals),

worms are packed in seaweed-filled boxes and shipped by a variety of means, e.g. Greyhound bus, private trucking companies, air freight. Some dealers have their own trucks.

Usually, a dealer has a regular "core" of wormers from whom he purchases. A dealer must have a steady supply in order to satisfy his out of state buyers, so he endeavors to keep "his" wormers happy. There are very few worm dealers in the state, and they are located in only seven ports (see descriptions of the ports of Hancock, Sullivan, South Addison, Wiscasset, Newcastle, Boothbay, and Jonesport).

Legal Environment

All commercial fishermen operating in Maine and New Hampshire waters must obtain licenses--shellfish, lobster, finfish, etc. Each fishery has somewhat different fees, requirements, etc. Complicating the legal situation is the fact that some fisheries fall under both state and Federal jurisdiction. Therefore, our discussion of the legal environment of Maine and New Hampshire fisheries is very general. Only information necessary for a fuller understanding of the port studies is provided.

Groundfish

The legal environment in the groundfish fishery is complex because groundfishing takes place in both state and federal waters. Furthermore, since the Fishery Conservation and Management Act (FCMA) went into effect in 1977, federal management of the groundfishery has been complicated and is changing virtually constantly.

Under the FCMA, states retain rights to manage fisheries which occur predominantly within their territorial waters, which extend three miles from the shore or from the baseline from which territorial seas are measured. They also retain the right to manage fishing for federally-managed fisheries in these waters, so long as their actions or lack of actions do not impede the objectives of federal fisheries management plans. As of 1980, Maine and New Hampshire had only a few regulations on groundfishing, most of which were not comprehensive but only covered certain areas or species.

Federal fishery management takes place through Regional Councils. The New England Regional Fishery Management Council is made up of state fishery directors from the five coastal New England states, the Regional Director of the National Marine Fisheries Service, and "knowledgeable" individuals from the public sector from all states, nominated by the states' governors and appointed by the U. S. Secretary of Commerce. Most of the public members come from some area of the fishing industry. Maine presently holds three of the public seats in the New England Regional Fisheries Management Council, in addition to the seat held by the Commissioner of Marine Resources.

Under the Fisheries Conservation and Management Act, the Council draws up fisheries management plans which describe the fishery in terms of biological, social and economic objectives, and which set forth conservation and management objectives and strategies designed to achieve optimum biological, social and economic aims. These plans are developed with the help of industry advisors, and are given public hearings. The Council then "signs off" the plan, and it is sent to the Secretary of Commerce for approval or rejection. Once approved by the Secretary, the National Marine Fisheries Service is responsible for the implementation of the plan.

A federal plan for the major New England groundfish species has been in effect since March, 1977. The Council has managed cod, haddock, and yellowtail flounder (the most popular and over-exploited species) since that time, in what has been a frequently changed, confusing, and unpopular regime. While several different management regulations were put into effect, the key one has been the establishment of quotas. The maximum sustainable yield of a stock was determined by scientists at the National Marine Fisheries Service Lab at Woods Hole, and when that amount of fish was caught, fishing was prohibited. Confusion surrounding the Council groundfish regulations has occurred because frequent changes have been necessary in order to try to correct problems caused by the plan itself. Both the Regional Council and the NMFS have made frequent changes: NMFS primarily by closing and opening the fisheries in attempts to try to keep catches within the

quotas, and the Council by trying to make structural changes in order to solve the allocation problems being caused by the low quotas.

A good deal of the uncertainty, rapid changes, and lack of stability came about because of the political activities of the fishermen themselves, who felt that the regulations were attempting to drive them out of business or to make it almost impossible for them to maintain an adequate income. Their fears were not unjustified, and in many instances their political activities were successful in changing regulations to ease the impact on the fishing industry (e.g. quotas raised, fishing moratoriums lifted, etc.). All told, during the period from March, 1977 to the end of 1979, there was some change in groundfish regulations almost every month. The negative effect of groundfish regulations was exacerbated by biological and technical factors involved in groundfish harvesting. For the most part, gear used for groundfish (i.e. otter trawls, gillnets, and longlines) is not species selective. Thus, for example, during a ban on cod and haddock, there is no way one can use otter trawls to catch the permitted hake, pollock, whiting, etc. without also catching some of the "forbidden" cod and haddock. Although some fishermen with a variety of gear could switch to other species to some extent when closures came, with only a few days loss of revenue while they shifted gear types, most could not do this. Many fishermen under the quota system of regulations were faced either with violating the law or going out of fishing during the duration of the ban.

During this whole period, Maine and New Hampshire have not passed any regulations to either support or complement the Council's plans, although several state laws have been discussed, especially in Maine, and even have been taken to public hearings.

In 1979, the Council was working on two management regimes. First, there is an interim plan which is being designed to hopefully eliminate the worst problems caused by the old plan. Second, there is a more comprehensive, long-term management attempt, the Atlantic Demersal Finfish Plan (ADF). This plan will include other species caught along with cod, haddock, and yellowtail flounder, so that the entire mixed trawl fishery of New England would be managed under a single plan. Certainly this is more realistic from both a biological and a socio-economic point of view. Neither of these will be in effect before 1981, however, and the Atlantic Demersal Finfish plan is scheduled to begin at least a year after that.

Herring

There are a good many Maine state regulations governing the taking of herring. In addition, the New England Fisheries Management Council currently has a management plan for herring under Federal jurisdiction. This plan clearly recognizes the connectedness of the inshore and offshore fisheries, and therefore includes the Maine juvenile inshore fishery in its considerations, even though this is carried on within the state's three mile territorial waters. There are also a good many state regulations governing transport and processing, which will not be described here.

The most important Maine herring regulations are those governing conservation and the operation of fixed and mobile gear. Herring under 4 1/2 inches may not be taken or sold (except that up to 25 percent of a given lot may be over this size). Periodic spawning closures are another conservation measure. Several regulations prohibit the setting of seine or nets near licensed weirs, and prevent purse seiners from operating near stop seines which are in operation. Purse seining herring is forbidden altogether in Washington County waters from April 10th to October 15th. All these latter laws are designed to protect traditional fixed-gear operations.

Since very few schools of herring frequent New Hampshire waters, the state has not developed a management plan for herring.

Lobster

To date, lobster fishing regulations have fallen entirely under state jurisdiction. However, as of 1979-1980 there is a proposed New England-wide lobster management plan being prepared by the New England Regional Fishery Management Council.

Although Maine and New Hampshire laws governing lobstering vary somewhat in detail, both states have minimum size regulations (3 3/16ths inches, measured along the carapace, for Maine, and 3 1/16th inches in New Hampshire), both states require traps to be marked with license numbers and lobster buoy colors to be registered with the state, and both states forbid the taking of egg-bearing females. In addition, Maine has a law forbidding the taking of lobsters five inches or larger, based on the assumption that larger lobsters are "breeders." Maine also recently instituted a regulation requiring that traps be vented to allow undersize lobsters to escape. Additional laws govern the timing of lobster fishing (e.g. in Maine, no lobsters may be taken on Sundays from June 1st through August 31st), or govern fishing in specific areas (e.g. lobster fishing around Monhegan Island, Maine may only be done from January 1st through June 25th).

Soft-Shell Clams

Management of clam resources in Maine is unique among Maine's fisheries. While a state shellfish license is required, most aspects of management are in the hands of the individual town having jurisdiction over the tidal flat.

Under state law, any municipality in Maine that votes to do so may set up a shellfish conservation ordinance, and may manage shellfish (including clams) by a variety of means (the most common, and most controversial, being a limited entry scheme whereby only town residents or those receiving a license from the town may dig its flats). Clams may be dug only by hand, except that the Department of Marine Resources is empowered to grant a special license for the operation of hydraulic or mechanical soft-shell clam dredges. Finally, state law provides for the Department of Marine Resources to close polluted or infected flats to digging.

In New Hampshire, the small clam resource is reserved exclusively for recreational fishermen who are residents of the state. No commercial harvesting is allowed. There is no size limit on clams in New Hampshire, but harvesting is not allowed in the summer months.

Scallops

In Maine, scallop fishing requires a scallop license, at a cost of \$25. Only resident licenses are issued, but one license covers both captain and all crew members on a given boat. Scallop fishing is closed in most Maine state waters from April 16th to October 31st. To promote conservation and preserve the breeding stock, no scallops under three inches across the shell in its longest diameter may be taken, except that 10% or less of any bulk pile may be under three inches. There are some local area restrictions as well: in parts of Blue Hill Bay, it is unlawful to fish for scallops with any one combination of scallop dredges in excess of eight feet in width; and scallops may not be taken by otter trawl in the Penobscot River, north of a line drawn from Castine, through Islesboro, to Northport.

Very little scalloping is being done from New Hampshire ports. The state, however, forbids taking scallops under 3 inches. Moreover, scallops may not be taken between April 15 to October 15.

SECTION II

THE PORTS

EASTPORT

Physical Setting and Population

Eastport, with a population of 1989 (1970 census), is the easternmost city in the United States, and the easternmost deepwater port. Because of this, it has received attention as the possible site of a mammoth facility for the reception and storage of imported oil. The city is located on the east side of Moose Island and is connected by causeway to the mainland. Its location places it on the principal approach to Passamaquoddy Bay and the St. Croix River. Deer Island, Canada is directly north of and very close to Eastport. Campobello Island, Canada is to the east and also very close. Lubec is almost directly south, and is only about five miles away by water. Overland the distance between the two is over forty miles by the road circling Cobscook Bay.

Major Industries and Economic Pursuits

Eastport and its environs can best be described as an economically depressed area. The community has historically been heavily dependent on the sardine canning industry. Declines in the fortunes of the industry have been paralleled by circumstances in the town. Today, the herring industry is still important, but is of far less consequence than it has been in the past.

In addition to the fish processing facilities which will be considered in a following section, Eastport has a small woolen mill, Guilford Mills, specializing in the spinning of yarn. This mill burned in the fall of 1978, but is being rebuilt and will employ up to 300 people when in full operation. The other major nonfishing employment in the area is provided by the pulp mills in Woodland, roughly thirty-two miles from Eastport. Men from Eastport and the surrounding area commute to the pulp and paper mills daily. This Georgia Pacific Corporation facility is the biggest single employer in Washington County with over 1000 employees.

General Infrastructure

Eastport is served by a good quality paved highway (Route #190) and a railway line, in addition to being accessible by water. A ferry operates between Eastport and Deer Island, Canada during the summer. Eastport is a Customs port of entry.

The community has a complete range of retail businesses from a supermarket, to hardware stores, a drugstore, and restaurants. The total business community of the town is small, and most establishments are concentrated along the road entering the town and the street nearest the waterfront. Eastport's businesses continue to service a relatively large surrounding hinterland, but the Calais-Woodland area has new shopping malls and more extensive business districts and attracts a large portion of the region's retail trade.

The general impression even the casual visitor receives when viewing Eastport's central business district is one of neglect and deterioration. Abandoned and crumbling buildings abound, as do open lots where already demolished buildings once stood. The same is true in many residential areas of the town, where neglected and decaying houses are a common sight.

A new development in Eastport is the Washington County Vocational Technical Institute. This was recently moved from Lubec.

Port Infrastructure

Anchorage near Eastport for large boats are extensive and present a minimum of hazards. No special facilities are available for large craft. For the use and protection of small craft there is a substantial L-shaped town dock which affords good protection but which is simply not large enough to comfortably accommodate all of the boats using it. The transfer of materials is accomplished from trucks brought onto the dock. There are no other services available at this dock.

Immediately south of the town dock is a small private dock maintained by one of the local fisherman. Many of the handliners use this facility and store their catches in a small icing room there.

The herring processors in the area have their own facilities for unloading sardine carriers but these are not available to other craft.

Types of Fishing

The herring industry, clam digging, handlining for groundfish, and scallop dredging are the primary fishing pursuits in the Eastport area. Minor fisheries include tub trawling for halibut and groundfish and very limited lobster fishing.

Herring

1. Number of Boats, People, and Fishing Areas

The herring industry tends to dominate the fisheries of Eastport and the surrounding area. The primary capture techniques employed in the area are stop seining and weir fishing. A single purse seiner operates from the area.

The focus of herring fishing in the Eastport area is along a stretch locally referred to as the "Perry Shore," just north of Eastport and extending along the United States side of Passamaquoddy Bay and the St. Croix River. During the 1978 season, fifteen weirs operated by seven individuals were placed along the shore. Most weir operators also possess stop seining equipment. At least as many more men do at least some stop seining when conditions permit. The family firm with the largest number of weirs also owns the "Chester Marshall," a 70 foot purse seiner.

Fishing for herring with weirs and stop seines presents unusual and erratic labor demands so it is impossible to present figures for the total labor force involved without qualifications which would render them meaningless. Construction of a weir requires the efforts of two men, but often more are involved on a part-time basis. Tending the weir is a one man job until fish are to be removed or repairs need to be made.

Stop seining is equally complex. A very large portion of the time involved in a stop seining operation is spent observing the bays and inlets where seines may be set. Only rarely is the seining crew assembled and the nets deployed. As noted, it is usual to combine weir fishing and stop seining activities.

Given these considerations, a reasonable estimate for the number of men involved in weir fishing and/or stop seining is around fifty. The intricate patterns of financing, cooperation in work efforts, and division of rewards is beyond the scope of this treatment. Suffice it to note that such patterns are present for virtually all weir and stop seine operations.

Large boats are not required for either weir fishing or stop seining. Small outboard-powered boats are all that are needed. Each operator has at least two small boats and often more. One individual uses an inboard-powered lobster boat as a utility craft.

2. Marketing

Herring marketing is a regional rather than a local phenomenon. Fishermen sell their catches to processors who generally provide sardine carriers to move the fish from the area of entrapment to the processing plant. Fish caught along the Perry shore find their way to processing plants all along the eastern coast of Maine and to factories in nearby New Brunswick towns. Herring fishermen usually have long-standing informal arrangements with processors. The processor has first option on any fish caught, in return for which he is obliged to help the fisherman find a market if he is unable to take the catch. Financial considerations such as low or no interest loans are often also part of these informal relationships.

3. Processing

The eastern shore of Moose Island is dotted with the remains of abandoned sardine canneries in various states of decay. Others have completely disappeared. Today only two concerns remain in operation: The Holmes Packing Corporation, and the Mearl Corporation.

Scallops

1. Number of Boats, People, and Fishing Areas

Five boats engaged in scalloping during the 1978-1979 season. There are three others capable of dredging scallops, but for a variety of reasons it seems unlikely they will be used. All of these are old wooden boats in the 40 to 44 foot class, used as day boats and working close to shore with crews of three to five men.

2. Marketing

No formal marketing structure exists for scallops. Catches are sold to waiting customers at the dock or to customers who have requested specific quantities in advance.

3. Processing

Scallops are shucked on the boats. No further processing is done.

Groundfish

1. Number of Boats, People, and Fishing Areas

Up to twenty men are engaged in handlining, but the number involved at any given time varies markedly. Activity is lowest during the rough weather winter months. Open boats 18 to 20 feet in length and powered by outboard motors are used for handlining, with one or two man crews. Pollock and cod are the primary species taken.

2. Marketing

One of the local fishermen attends to most of the marketing of fish landed in Eastport. This is the same individual who has the small wharf facility with the ice storage room. Fish are stored on ice, and arrangements made to transport them to a buyer on Campobello Island by pickup truck. Aside from this casual set of arrangements, no marketing system for groundfish exists in Eastport.

3. Processing

Processing, like marketing, is strictly an informal operation. One fisherman fillets and freezes some fish for sale to friends and neighbors. No other local processing of fin fish occurs.

Clams

1. Number of People

Clamming has more men involved in it than any other fishery. Eastport proper has about 25 clambers; Pleasant Point (the Passamaquoddy Indian Reservation) about 15; Perry around 30; and Pembroke about 10. Only an estimated 10% of these men are full-time clam diggers, most combine this with other economic pursuits, for example, handlining or work at the Mearl Corporation plants.

2. Marketing

Clams are usually sold to the Pembroke Shellfish Company in Pembroke which is very near Eastport.

3. Processing

No processing is done in the area.

Minor Fisheries

Tub Trawling. Four men engaged in tub trawling in 1978. Most efforts were directed toward catching halibut, with some groundfish being taken. With the exception of one retiree who rather avidly pursues the activity as something of a hobby, tub trawling is an incidental activity.

Lobstering. Two men fish for lobsters part-time. Each, rather coincidentally, has seventeen traps and treats lobstering as a hobby. Neither man markets any of his catch.

Important Institutions Related to Fishing

Holmes Packing Corporation

This company operates a sardine canning plant in an older wooden building near the downtown section of Eastport. The company employs between 90 and 125 people during the height of the season. The plant does nothing but pack herring in 15 oz and 4 oz cans, which are sold under the Holmes label.

Mearl Corporation

The Mearl Corporation operates four different plants in different sections of Eastport and employs about 250 people on a full-time basis. The plant at Estes Head, about one mile west of the center of Eastport, employs 75 people filleting and freezing herring and alewives. The herring are shipped directly to Europe on refrigerator ships that dock at Eastport; the alewives are shipped to other locations in the U. S. where they are used in "pickled herring." The plant at Broad Cove has 50 to 75 employees and manufactures three products: fish meal and oil; pearl essence from fish scales; and fire foam from chicken feathers and hog bristles which it obtains from Pine State Byproducts, Inc. in South Portland. At Princess Cove, also on the western side of Eastport, Mearl has a plant that canned herring and fish roe, but this was closed in 1978. Close to the downtown section of Eastport, an old can manufacturing plant has been turned into a freezer and cold storage operation. Twenty-five people who skin herring by hand are also employed in this building.

Quoddy Boats

This small plant, located in Quoddy Village on the outskirts of Eastport, employs six people in the manufacture of small fiberglass boats.

Argenta Products Company

This company operates a small plant on a wharf near the center of Eastport, which manufactures pearl essence from herring scales. The scales are obtained from herring carriers in Maine and Canada; the pearl essence is sold to cosmetic manufacturing companies in the U. S. The company was begun in 1949 and employs six people.

Maine Pearl Corporation

This company has a small plant on the eastern side of Moose Island where it employs about six people manufacturing pearl essence.

Distinctive or Unusual Characteristics of the Harbor

Eastport is probably most notable for the importance of the herring industry in the local economy. Very few other communities are so heavily influenced by it. Eastport reportedly has the only plants in the nation manufacturing pearl essence, which is a silvery substance made from herring scales.

The presence of handlining as the major method for taking groundfish is an equally unusual feature. To our knowledge, Eastport and Lubec are the only areas along the New England coast where handlining is still a commercial fishing technique and Eastport the only one where it is predominant.



LUBEC

Physical Setting and Population

Lubec with a population of 1989 (1970 census) is on the Canadian border. In the township is Quoddy Head Lighthouse, the most eastern location in the United States. The town is located on a peninsula or "neck" with a northeast to southwest orientation, and it is separated from Campobello Island, Canada by the Lubec Narrows. A bridge spanning the narrows connects Lubec with Campobello.

The town is located on the southern rim of the mouth of Cobscook Bay, opposite Eastport on the northern rim. Like Eastport it is relatively isolated, being over forty miles from Machias and over fifty miles from the Calais-Woodland area, the two main commercial centers in the region.

Major Industries and Economic Pursuits

Lubec was, along with Eastport, the focus of a once thriving sardine industry. Abandoned canneries are still scattered along the shoreline of the area as mute testimony to the decline of the industry. The herring industry is still important to the community but both the community and the industries are remnants of a past era.

Aside from limited fishing activities, discussed later, and modest retail businesses, Lubec has no major industries. Economic options in the area are quite limited. A few individuals commute to the Woodland area to work in the Georgia Pacific pulp and paper plants. A few more commute to the woolen mill in Eastport. Another handful work as woodcutters. Very few additional employment alternatives are present.

General Infrastructure

Lubec is served by a good quality paved highway (Route #189) in addition to being accessible by water. It also has a small airport suitable for light planes.

The community has an essentially complete range of retail businesses from a supermarket, to gas stations, to hardware stores and a motel. Most are of very modest size. The majority of these establishments are situated along the highway entering Lubec or along the waterfront.

Lubec, in the same manner as Eastport, conveys the impression of deterioration and neglect. The central business district (or possibly more accurately what was once the central business district) along the waterfront is a collection of crumbling old buildings. Neglected and decaying homes in the residential areas of the town are an equally common sight.

Port Infrastructure

Although the area around Lubec has the highest tides recorded in the United States and very fast currents, the area around the peninsula on which Lubec is situated abounds in good, well-protected anchorages for shallow draft boats. This is particularly true in Johnson Bay, on the northeast side of Lubec.

Lubec's main waterfront is along Water and Commercial streets on the east and north sides of the peninsula. The only public facility available for the use of small boats is the State boat launching facility, designed primarily for recreational use. The herring processing firms are also situated along the waterfront and have facilities for unloading sardine carriers. Their facilities are not available for public use.

The town has made requests for funds to construct a commercial pier adjacent to the existing boat ramp. If construction plans have gone according to schedule it should either be complete or near completion as of this writing.

The lack of developed wharf facilities and the multiplicity of good anchorages in the area has resulted in the dispersion of fishing boats over a wide area around Lubec. Boats can be found anchored in suitable locations from North Lubec (a primarily residential area on the peninsula adjacent to Lubec and extending into Cobscook Bay) to Trescott which is located about ten miles southwest along the coast.

Types of Fishing

The herring fishery, clam digging, tub trawling and handlining for groundfish, scallop dredging and lobster fishing are the primary pursuits in the area. The predominant pattern is of multiple fishing operations or of a combination of fishing and nonfishing efforts. Heavy specialization in a single fishery is the exception rather than the rule.

Herring

1. Number of Boats, People, and Fishing Areas

The herring fishery is very important to Lubec in the same manner as it is in Eastport. Along with the local fishery, Lubec has canneries which are supplied by sources all along the coast and from Canada. Hence, fish processing, as well as fishing, is a source of employment.

The primary herring capture technique employed locally is stop seining. During the 1978 season at least six seining crews were in operation. Additional individuals would probably respond to fishing opportunities if they presented themselves. As usual with stop seining and weir fishing, only small outboard-powered craft are needed to tend the nets. One purse seiner (52 feet "Rodine") operates from Lubec. In addition, there were 6 weirs in operation in 1978, and more were being constructed.

As in the nearby Eastport area the demand for labor in herring fishing is erratic and seasonal. Part-time sporadic involvement is the rule rather than the exception. In all, 35 to 40 men devote at least occasional effort to herring fishing.

2. Marketing

Herring are marketed directly to processors who provide carriers to transport the fish to their processing facilities. The pattern is the same as that for fishermen in the Eastport area (see Eastport - Herring: Marketing).

3. Processing

Lubec has five concerns processing herring: The R. J. Peacock Canning Company, Booth Fisheries, the McCurdy Company, U.S.A. F.I.S.H., and Nordic Delight, Inc.

Other Fisheries

1. Number of Boats, People, and Fishing Areas

As complex as the patterns of the herring fishery are, it is easier to delineate than the other fisheries in Lubec. At least for herring it is possible to note the number of operations and the number of processors and to provide a good approximation of the total labor force at peak production periods. It was impractical to develop this type of data for the remainder of Lubec's fisheries.

The economic depression of the region has resulted in a high degree of dependence on various governmental subsidies. This makes the remunerative activities of many individuals a sensitive topic. It is generally acknowledged that some abuses or "bending" of some regulations covering receipt of subsidies occurs but, for obvious reasons, such matters are not discussed in detail.

James Wallace and Sons, the only buyer of groundfish and shellfish in Lubec, purchased marine

products from an estimated 203 different individuals in 1977. Unfortunately, information is available for only about 50 of these individuals. The remaining 150 individuals fish and dig clams on a sporadic part-time basis.

The general picture emerging from the incomplete information available indicates the following distribution of fishing efforts.

| | | |
|-------------------------------|------------|----|
| Lobstering (exclusively) | full-time* | 7 |
| | part-time | 4 |
| Stop seining/weir fishing for | full-time | 4 |
| herring (exclusively) | part-time | 4 |
| Combined fishing efforts** | full-time | 18 |
| | part-time | 6 |

A further indication of the composition of the fisheries in Lubec is provided by the registry of boats there. In 1977 approximately 150 were registered. Of these, only six were 25 feet in length or longer (one of these has since burned). There are a number of boats in Lubec which are not registered. Local informants suggest that 15 boats over 25 feet is a more realistic projection. The total number of boats, which includes even small recreational craft, is probably around 200.

The boats under 25 feet have very limited applications, and are used primarily by clam diggers, tub trawlers, handliners, lobster fishermen and, of course, stop seiners. The larger boats are used primarily for lobstering and tub trawling, with a couple of individuals engaging in limited scallop dredging and gillnetting.

2. Marketing

As noted, Lubec has only one seafood buyer (James Wallace and Sons) who conducts a modest business. Some seafood is marketed locally, with the remainder trucked to other markets, usually Boston. Additionally, some fish is marketed to a Canadian buyer (Jackson's at Wilson's Beach) on Campobello Island. Wallace handles limited quantities of lobsters. More are marketed to the buyers in Cutler 20 miles by road down the coast.

3. Processing

The only processing done, excepting herring, is by James Wallace and Sons which has a small fish filleting facility. The modest quantities of fillets produced are for the local market and are sold from the small retail store also operated by Wallace.

Important Institutions Related to Fishing

Booth Fisheries

Booth Fisheries operates a herring packing plant located in an older building on Cobscook Bay about one half mile from the main street of Lubec. Between 60 and 100 people are employed there packing herring in oil. The plant owns one herring smack, the 59 foot "Bofisco III."

The McCurdy Company

This company operates a smoke house and herring packing operation on the main street of Lubec.

*Full-time means the individual devotes all of his efforts to fishing. Part-time means the individual also has some type of non-fishing occupation.

**Combined fishing includes a diverse array of efforts (clam digging, stop seining, trawl fishing, and handlining for cod, pollock, and halibut, scallop dredging and gillnetting). Accurate information on clam digging is unavailable, but clamming, according to several local sources, is the largest fishery in the area. Many of the individuals selling marine products to James Wallace and Sons are marketing small quantities of clams.

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The company's smoke house will hold 600 hogsheads of herring. The smoked herring are then skinned by hand, and packed in wooden boxes (10 lbs.) for shipment. The company employs about 20 people during the height of the season. The herring are sold, in the main, through a broker in Boston.

R. J. Peacock Canning Company

The Peacock Company Plant is located on the main street of Lubec. During the peak season, it employs between 60 and 100 female packers, and another 15 or 20 men who are involved in maintenance, machinery operation, etc. The company has two herring smacks: the "Grayling" (60 feet) and the "Medric" (61 feet), which generally operate only in Passamaquoddy Bay or waters nearby.

U.S.A. F.I.S.H.

This concern had not begun operation in the summer of 1978. However, the firm is planning to fillet herring by machine, freeze it, and ship it to Europe. In the early stages of the operation, the work force was projected to be between 10 and 20.

Nordic Delight, Inc.

This is a very small "backyard" type of operation located in North Lubec, which packs and markets pickled herring. In 1978, jars of herring from this firm were being sold throughout Maine.

Herring Pumping Stations

The Stinson Canning Company and the L. Ray Packing Company of Milbridge maintain large pumping stations in Lubec to transfer herring from carriers and purse seiners to trucks. Both pumping station docks are along the main street. The trucks in turn take the fish to the company plants at other locations along the coast. Neither L. Ray nor Stinson have plants in the Lubec area, but both buy substantial quantities of herring from Canadian boats. These pumping station docks in Lubec are thus one of the major lines in the system by which a very large amount of herring enters the United States.

Distinctive or Unusual Characteristics of the Harbor

The importance of the herring industry, as in Eastport, is the most notable feature of Lubec's fisheries. The overall economic distress of the area is equally notable.

In addition to these glaring features, Lubec stands out because of the virtual lack of fisheries infrastructure for anything other than the ailing herring industry. Both physical facilities and well established market patterns are absent.

The individual fishing strategies of fishermen in the area, in sharp contrast to the specialization in other regions, are highly diversified. Extremely few are strictly fishermen, and even fewer specialize in a single type of fishing. The usual pattern is to combine a variety of economic pursuits, of which one may be some type of fishing.

CUTLER

Physical Setting and Population

Cutler is 14 miles southwest of West Quoddy Head. Along highway 191, the community is 20 miles from Lubec and 17 miles from Machias. It is located at the head of an excellent and very pictureque harbor. If the Naval radio station is included, Cutler has a population of 588; excluding the installation, the population is about 400.

Major Industries and Economic Pursuits

The primary economic activity in Cutler is fishing. The town has two commercial docks. The only other commercial establishment is a small general store, and the small A. M. Look Cannery. About 10 to 15 men cut pulpwood. The Naval radio station built in 1961 has added a few local jobs (10 to 15), but has not influenced the area markedly in other respects.

Roughly one half of the 160 houses in Cutler are now occupied by people who occupy them seasonally. The seasonal summer population is growing increasingly important, not only as a source of employment for a few local individuals, but more important, because it supplies a significant portion of the local tax base.

General Infrastructure

As noted, Cutler is served by Route 191, which is a good paved road. It is of course also accessible by water. Also as noted, it has a single small store. Machias is the primary shopping area for the community, although trips to the Calais-Woodland area are not uncommon.

In general, Cutler is more of a rural location than a nucleated settlement, as are many other small hamlets along the coast. Aside from the town hall, it does not have the trappings of a town.

Port Infrastructure

The harbor at Cutler is probably one of the best small boat harbors in Maine. It is protected by hills on three sides and an island at its mouth. Several hundred boats could easily be moored in it. Two commercial docks service fishermen and recreational craft. In addition, a number of private docks are maintained by fishermen for handling and storing equipment.

Types of Fishing

Lobstering and clamming are by far the two most important fisheries in Cutler. Stop seining for herring is the only other commercial fishing activity.

Lobster

1. Number of Boats, People, and Fishing Areas

Cutler has 22 lobster boats (the specialized lobster fishing design) and eight skiffs powered by outboard motors engaged in lobster fishing. Twenty men were full-time lobstermen, while 16 combined lobstering with other activities in 1978.

2. Marketing

A. M. Look and Neil Corbett operate commercial docks. These operations specialize in the purchase of lobsters, and also supply fuel and supplies to fishermen.

3. Processing

No processing of lobsters takes place in Cutler, but A. M. Look company does process some lobster meat at their plant in Whiting.

Clams

1. Number of People

In 1977 there were 85 resident clamming licenses issued in the town. Interviews with fishermen indicate that 25 men make the major portion of their income from clamming. In addition, 83 non-resident licenses were issued, which allow the holder to take up to one peck of clams per day for personal consumption.

2. Marketing

Neither of the two clam buyers (Arthur Porter and Dan Look) have specialized facilities for their operations. Both purchase clams for resale to a variety of outlets.

3. Processing

No processing of clams is done in Cutler.

Herring

1. Number of Boats, People, and Fishing Areas

There is only one stop seining operation in Cutler, which operates with a nine man crew. All of the individuals involved are also lobstermen. Two boats are used.

2. Marketing

As for most stop seining operations, marketing arrangements are made between the man controlling the operation and processors. Sardine carriers are dispatched by the processor to the area of fish entrapment to move the fish to the processing plant.

3. Processing

No local processing of herring.

Important Institutions Related to Fishing

A. M. Look Cannery

This company, which is also in many other facets of the fishing business, operates a small cannery in Whiting, which is nearby. It produces products made from crab, clams, and lobster (e.g. clam dip), and employs six to eight local women.

Distinctive or Unusual Characteristics of the Harbor

The most outstanding feature of Cutler is the tall set of radio towers the Navy has at its installation and the fact that the installation is there. With Eastport and Lubec being very minor lobster fishing areas, Cutler has the distinction of being the last significant lobster fishing harbor before reaching Canada.

MACHIASPORT AND BUCKS HARBOR

Physical Setting and Population

Machiasport is located about two and one half miles below Machias which is the head of navigation on the Machias River. Bucks Harbor is located roughly eight miles south of Machiasport on the west side of Machias Bay. Additional anchorage is available at Starboard Cove, a small cove two miles south of Bucks Harbor.

Machiasport has a population of 887 (1970 U. S. Census). Figures for Bucks Harbor and Starboard are unavailable, but combined they should equal somewhat less than Machiasport.

Major Industries and Economic Pursuits

The commercial focus of the area is in Machias and East Machias. Aside from the cannery in Machiasport, a small boat yard, fish dealers, the main businesses in the areas are a few small stores. Fishing is an important activity in the area. A significant number of people commute to jobs in Machias.

General Infrastructure

The Machiasport, Bucks Harbor, Starboard area is connected to Machias by a fair quality paved road. A rail line services Machias which also has a small airport. All of these locations can be reached by water. There is no shopping district in either town. People from the area do most of their shopping and obtain most services in nearby Machias. The few businesses south of Machias tend to be located along the highway except those related to fishing which concentrate on the water.

Port Infrastructure

Machias, well up the river, has a paved town launching ramp suitable for small boats. Machiasport has a cluster of small wooden floats which are used as a landing dock for small boats. It is also the location of a sardine cannery. A small boat shop is located at Starboard but it has no dock facilities. Bucks Harbor has the dock facilities of two lobster buyers and a clam dealer.

The major anchorage areas in the region are at Bucks Harbor and Starboard Cove, although a few boats are kept at Machiasport.

Types of Fishing

Lobstering and clam digging are the primary fishing activities in the area. Mussel dredging ranks a distant third.

Lobster

1. Number of Boats, People, and Fishing Areas

Bucks Harbor is the focus of lobster fishing in the area. Approximately 40 specialized lobster boats (25-35 ft. class) and 20 skiffs with outboard motors are moored there. Starboard Cove has five lobster boats and four skiffs, while Machiasport has three or four lobster boats. Generally each craft has a single owner-operator, bringing the total number of men involved in lobstering to about 70-75.

2. Marketing

There are two lobster buyers in Bucks Harbor (Bucks Harbor Lobster Cooperative and the Bucks

Harbor Lobster Company). Each has dock facilities and supplies fuel and bait to fishermen. Fishermen at Machiasport and Starboard get supplies and sell lobsters at Bucks Harbor.

3. Processing

No processing is done in the area. The Bucks Harbor Lobster Company is doing work on a lobster pound which is anticipated to be operational in 1979. In operation, it should have a capacity of approximately 35,000 lbs. of lobsters.

Clams

1. Number of People

We have no precise information on the number of clam diggers in the area; there are at least 150 who get some of their income from clamming. However, only 30 to 35 of these can be considered full-time clammers.

2. Marketing

Bucks Harbor Seafood buys a significant proportion of the clams dug by local diggers. Alfred Polk, a local man, also buys some clams. One company from Boston periodically sends a truck to the local area to buy mussels; and a clam buyer from Pine Point, Maine periodically sends a truck to buy clams.

3. Processing

Bucks Harbor Seafood, the largest clam buyer in the area, operates a schucking house and shucks a large proportion of the clams it purchases. Machiasport Canning Co. is located near Bucks Harbor.

Minor Fisheries

Bucks Harbor has seven boats which did some tub trawling, primarily for halibut in 1978. These were all lobster boats which engaged in tub trawling for only about three months during the spring before returning to lobstering exclusively. Five boats do some mussel dredging. Two operate as dredgers most of the year, while three devote most of their time to lobstering. All are converted lobster boats. One local lobsterman, in past years, has operated a stop seine for herring.

Important Institutions Related to Fishing

Bucks Harbor Fishermen's Cooperative

This Cooperative was started in 1974. It owns a large pier at Bucks Harbor itself. There are 19 members in the Co-op, but some 60 men from Bucks Harbor and neighboring harbors regularly sell there. The cooperative supplies fuel and bait.

Bucks Harbor Seafoods

This small company is located in Bucks Harbor, and operates a clam buying and shucking operation. The company buys clams from about 20 local men in the summer, and employs a buyer in Jonesport and another in Roque Bluffs who get clams from other men in those harbors. The shucking house employs 18 to 20 women at the height of the season. Much of the output of the company is sold to a buyer from Rhode Island.

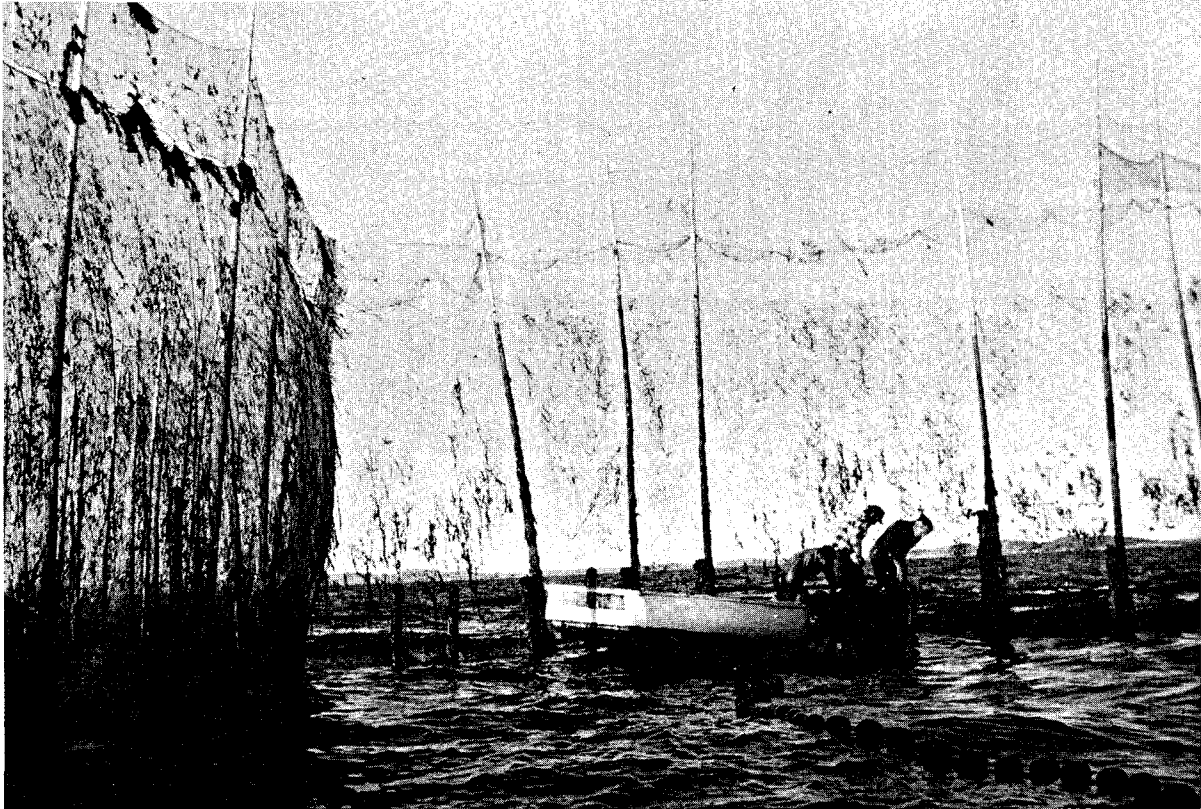
Machiasport Packing Co.

This company packs cans of herring in oil in its factory between Bucks Harbor and U. S. Route 1.

The company employs about 60 to 70 people. The company is owned by the L. R. Ray Corporation of Milbridge and packs herring under the L. R. Ray brand names.

Distinctive or Unusual Characteristics of the Harbor

Machiasport for practical purposes is not the center of fishing activity in the area in spite of the fact that a sardine cannery is located there. Commercial services are supplied to fishermen in Bucks Harbor, while Starboard Cove, the remaining heavily used anchorage in the area, is used primarily by pleasure craft.



JONESPORT AND BEALS ISLAND

Physical Setting and Population

Jonesport is located about 32 miles west/southwest of the Canadian border at Lubec. The town is on a peninsula, about 10 miles south of U. S. 1. Jonesport is on the north shore of Moosabec Reach; Beals Island, a separate township, is on the south side of Moosabec Reach opposite Jonesport. In 1970 the population of Jonesport was 1326 and the population of Beals Island was 663. A highway bridge was built between Jonesport and Beals in 1957.

Major Industries and Economic Pursuits

Fishing is the largest source of employment in Jonesport and Beals Island. There are, however, a large number of boat shops in these two towns, which build a high proportion of the small fishing boats used in Maine. These shops supply a substantial number of jobs for local men--particularly in the winter months. Jonesport has a small shopping district whose commercial establishments provide some employment. However, there are no other industrial plants in the area. Moreover, there are no motels or hotels catering to transient tourists, and only one restaurant. There are relatively few summer cottages in the area. Most of the houses are owned by local people, and occupied year round.

General Infrastructure

Jonesport and Beals are in one of the most isolated parts of the Maine coast. The area can be reached by sea or by automobile on Route #187, a small state highway. There is a small privately owned airfield in the local area, and the closest railroad connection is in Machias.

Jonesport has two hardware stores, a large IGA food store, a clothing store, a restaurant, ceramics store and a couple of convenience stores. There are two doctors and a lawyer in town as well. Nevertheless, many residents of the area do a good deal of their shopping and obtain many services in Machias or Ellsworth. Many families go to Ellsworth or Bangor at least once a month. Jonesport has a grade school and a high school. It also has several churches, including three denominations of Latter Day Saints.

There are no industrial plants or government agencies in Jonesport-Beals save for the Coast Guard station.

Port Infrastructure

There are three general anchorages used in the Jonesport-Beals area. About 45 inboard powered boats are moored all along the Jonesport side of Moosabec Reach. Another 42 boats are anchored off the northwestern side of Beals Island; and about 40 boats are moored in Alley Cove, on the northeastern side of Beals Island. Smaller clusters of boats are moored at other locations in the area.

There are several very large wharfs in the Jonesport and Beals area. The most notable are four piers in Jonesport: the U. S. Coast Guard wharf, which is protected by a large steel boathouse; the Jonesport/Beals Fisherman's Cooperative wharf; the wharf owned by E. W. Kelley Shellfish Company; and the Jonesport boat landing wharf, maintained by the state. There are another 30 smaller docks and wharfs all over the Jonesport and Beals area, belonging to lobster dealers, boat yards or private individuals.

Along the Jonesport waterfront are several other installations of interest: the Taubenberger Machine Shop, which maintains and installs boat machinery; the O.W. and B.S. Look, Inc. Company, which has two docks, one equipped with tanks which are used to receive oil, and the other used as a lobster dealership.

Types of Fishing

Jonesport is one of the largest lobster fishing harbors on the Maine coast. Several boats in the area fish for herring and groundfish. There are also a large number of clambers in the area.

Lobster

1. Number of Boats, People, and Fishing Areas

There are an estimated 160 lobster fishing boats in Jonesport and Beals. About 60 of these are owned by part-time fishermen, the rest by full-timers. At least 20 of these are over 38 feet and are used with a two man crew and large gangs of gear. Most of the boats are standard lobster fishing boats between 30 and 38 feet long. About 40 outboard powered skiffs are used in Jonesport-Beals; and a few fishermen have turned to large open skiffs (18 to 22 feet) powered by inboard engines.

Jonesport fishermen have a very large fishing area. They fish around Great Wass Island, and Beals Island. They also fish very far out to sea. It is not uncommon for Jonesport men to go 20 miles out. One fisherman, with a 55 foot fiberglass boat, fishes for lobster off-shore--as far away as the edge of Georges Bank.

2. Marketing

In Jonesport and Beals there are five companies that buy lobsters and supply fishermen with gas and bait. The largest in the entire area is the Jonesport-Beals Fishermen's Cooperative, located in Jonesport, which buys from about 60 fishermen on a regular basis. In Jonesport there are also two other dealerships: Bert Look's Wharf which buys from about 15 fishermen; and Leon Smith who buys from about 25 fishermen. On Beals Island there are two buyers: Uriah Beal and Son which buys from eight fishermen and Herman Backman with some 23 fishermen. Louis Kirby owns a lobster pound, but does not buy directly from fishermen.

3. Processing

No firm in the Jonesport-Beals area processes large amounts of lobsters. However, there are about five or six local women who buy lobsters and pick the meat for sale to restaurants and private buyers.

Herring

1. Number of Boats, People, and Fishing Areas

Four men regularly fish for herring in Jonesport and Beals. Two are lobster fishermen who have boats under 40 feet long and operate stop seines. Two other men have boats about 45 feet long, which they use for dragging and stop seining.

2. Marketing

Virtually all of the herring caught by these four men are sold to L. R. Ray or Wyman Canning Company in Milbridge, the Stinson Canning Company in Prospect Harbor or the Peacock Canning Company in Lubec.

3. Processing

No herring are processed in Jonesport or Beals at the present time.

Groundfish

1. Number of Boats, People, and Fishing Areas

There are four boats in Jonesport-Beals which drag for groundfish and another six which gill-net. None of these is under 35 feet long or more than 45 feet. Four owners of these boats are involved in herring fishing; and two others go lobstering during the late summer and fall. Seven or eight lobster boat owners regularly go longlining for groundfish in the spring.

2. Marketing

Three draggers and three gillnetters regularly sell their fish to E. W. Kelley Shellfish Company, which fillets a few for the local market and trucks the rest to Boston or other locations. One gillnetter and seven or eight trawl fishermen (longliners) regularly sell to a dealer who operates from the Co-op dock.

3. Processing

The E. W. Kelley Shellfish Company employs two to four filleters to process some of the groundfish they purchase for local markets. At present, no other company fillets groundfish in Jonesport-Beals.

Clams

1. Number of People

An estimated 50 men go clamming on a full-time basis, while another 60 men and boys dig clams from November to July.

2. Marketing

Some of the clams dug by people from Jonesport and Beals are sold to the Look Family, Inc. of South Addison, or to a buyer working for Buck's Harbor Seafoods of Buck's Harbor. More are purchased by Grey Shellfish Company and Carver Shellfish Company, two local dealers. Andy's Seafood from Sangers, Mass. has recently hired a local man to run a buying station in Jonesport.

3. Processing

Grey's Shellfish Company and Carver Shellfish Company both operate shucking houses. Carver Shellfish employs about 12-15 people and Grey's a smaller number.

Minor Fisheries

In the winter of 1975 only four men went scalloping in Jonesport and Beals. In the winter of 1978, about 55 fishermen rigged up for scalloping. Most of these boats are used to fish for lobsters in the spring, summer and fall. The Jonesport-Beals Cooperative is the largest single buyer of scallops in the area.

A few fishermen in Jonesport and Beals are beginning to go after mussels. Carver Shellfish, Frederick Cowles, and Andy's Seafood all buy mussels.

An estimated 20 men from the Jonesport and Beals area dig marine worms on a full-time basis. Another 125 youngsters do some digging in the summer. Most of these are sold to Clifford Hagan of West Jonesport, the B and J Bait Co., or to dealers in Addison.

Important Institutions Related to Fishing

E. W. Kelley Shellfish Company

This company recently bought out the Three Rivers Company. At present it is the major buyer and trucker handling groundfish in the Jonesport-Beals area. It employs between two and four filleters who process fish for the local market. Most of the groundfish it buys are shipped to Boston or to

other markets.

Jonesport-Beals Fishermen's Cooperative

This cooperative was started in 1967. It is one of the largest and most successful in the state. At present, there are approximately 60 members, and about the same number of men regularly sell lobsters there. The Co-op supplies fuel and bait. While the Cooperative does not buy groundfish it allows a private buyer to use its facilities to land groundfish there. In the winter, when several lobstermen, who are members of the Cooperative, rig up for scalloping, the Cooperative buys scallops.

The Cooperative owns no pound or other storage facilities. It sells lobsters both wholesale and retail.

U. S. Coast Guard--Jonesport Station

The Coast Guard maintains a Search and Rescue Unit with facilities in Jonesport, near the Beals-Jonesport bridge. There are 24 men attached to the Station who operate a 44 foot lifeboat and a 41 foot utility boat. An 82 foot patrol boat is also stationed at Jonesport most of the time. This boat is under the command of the Group Commander in Southwest Harbor and is used to patrol offshore areas.

Boat yards

In Jonesport there is one operating boat yard: Lenfesty's Boat Shop. In Beals there are the following boat yards: Gower Boat Yard, Willis's Boat Shop, Osmund's Boat Shop, Richard's Boat Shop, Libby's Boat Shop, Backman's Boat Yard, Clifford Alley and Sons Boat Shop, Mariner Beal and Sons, and Kelvin Beal Boat Shop. Most of these yards employ one or two men on a regular basis and hire additional help when needed. Only two of the boat yards operate throughout the year. The other eight are open only in the winter; their owners go fishing the rest of the year. Virtually all of these boat yards build small lobster boats under 40 feet long. Most of the boats are built of wood, although fiberglass is increasingly being used.

Emerson Bait Company

This company owns eleven trucks and has its headquarters office in Jonesport. It purchases herring cuttings and fish frames from plants in the United States and the Atlantic Provinces of Canada (including Newfoundland), and then sells them to cooperatives and lobster dealers in Maine for bait.

Lobster Pounds

The Jonesport-Beals Island area has the largest concentration of lobster pounds on the Maine coast. O.W. and B.S. Look have a pound in Jonesport. There are another seven pounds on various parts of Beals Island owned by Donald Alley, Elmer Beal, Carver Industries, Oscar and Kirby Look and the Libby Family.

SOUTH ADDISON

Physical Setting and Population

South Addison is located at the tip of a peninsula bordered on the west side by Western Bay and on the east side by Pleasant Bay. It is roughly 10 miles south of Route #1 on a paved secondary highway. The 1970 population was 773.

Major Industries and Economic Pursuits

The primary occupations in the area are fisheries-related.

General Infrastructure

In addition to a fair quality paved secondary road, South Addison is accessible by water. The area has a couple of small stores but no commercial districts. Most retail services are obtained in Milbridge, Jonesport, or Machias.

Port Infrastructure

South Addison has a comfortable small craft harbor. The commercial dock and lobster pound in the area have dock facilities. There are a few private docks in addition but no developed public facilities.

Types of Fishing

Clam digging is the single most important fishery in South Addison. This is followed by lobstering with herring fishing a very poor third.

Clams

1. Number of People

In the area around South Addison there are approximately 80-90 clam diggers of whom roughly half dig clams on a full-time basis.

2. Marketing

Looks Family, Inc. purchases clams from the local diggers.

3. Processing

In addition to purchasing clams, Looks Family, Inc. also operates a shucking operation (removing clams from their shells) which employs five local women as shuckers.

Lobster

1. Number of Boats, People, and Fishing Areas

There are about 24 lobster fishermen in South Addison. Ten of these are full-time fishermen, while the remainder fish on a part-time basis. Unlike many harbors with numerous skiff fishermen, South Addison has only two or three part-time skiff lobster fishermen.

2. Marketing

D. H. Looks is South Addison's only local lobster buyer. He also operates a small general merchandise store and carries supplies for lobstermen.

Eastern Harbor Lobster Pound (James Buckman, Prop.) operates a pound at South Addison. The pound is capable of holding 100,000 lbs. of lobsters. This is a wholesale operation which purchases lobsters from a variety of sources. It is not involved with the local fishery.

3. Processing

No processing is done in South Addison.

Marine Worms

1. Numbers of Boats and People

Approximately 25 men in the Addison and South Addison area dig marine worms on a full-time basis during the season and an indeterminate number of other men dig worms occasionally.

2. Marketing

Most of the worms dug by local fishermen are sold to Keith Crowley or Wright's Bait Company of Addison.

3. Processing

None.

Herring

In 1978 there was one herring weir operated from Eastern Harbor near South Addison. The owner has other business interests (primarily in Harrington), and made arrangements for others to handle the operation of the weir. It was a very unproductive venture, but catches would have been sold directly to a processor if they had materialized.

Distinctive or Unusual Characteristics of the Harbor

In a certain sense South Addison is caught in a pocket between the large fishing harbors of Jonesport on the east and fishermen from Milbridge on the west. Fishermen from these areas fish locations adjacent to the grounds used by fishermen from South Addison. It was suggested by local fishermen that the proximity of large fleets on either side of them tends to restrict the fisheries from the local area.

MILBRIDGE - STEUBEN

Physical Setting and Population

Milbridge is located near the mouth of the Narraguagus River and is situated along its western bank. Highway #1 enters the town from the west, with the divergence of highways #1 and #1A occurring virtually in the central business district. Steuben is about five miles west of Milbridge, a short distance on Route #1. Steuben and Milbridge are treated together because of their proximity and the patterns of interrelationship between the two areas. Steuben is the westernmost town in Washington County. Milbridge and Steuben have populations of 1154 and 697 respectively (1970 U. S. Census).

Major Industries and Economic Pursuits

Milbridge has a diverse range of retail business, from lumber yards and sardine canneries to a gift shop and a second hand shop. It covers essentially the entire range of retail goods and services the typical shopper could desire. Steuben has only a couple of small stores and a restaurant. Ellsworth (32 miles west) and Machias (23 miles east) are the two nearest shopping centers offering services comparable to those available in Milbridge. This puts Milbridge in the position of servicing a relatively large hinterland.

In addition to these retail services and supply businesses, Kelco Industries purchases balsam (evergreen) boughs which are fashioned into Christmas ornaments. This provides seasonal employment during the fall at their processing facility and a market for those who wish to harvest boughs. Wood cutting is also a significant pursuit for many individuals. Blueberry harvesting provides additional seasonal employment. The focus of the blueberry industry is north of Milbridge in the Cherryfield area but draws many workers from the Milbridge and Steuben areas.

Milbridge also has a 56 bed nursing home which provides additional local employment.

Finally, there are two boat building operations in the area. Franklin Beal and James Wallace finish and fit out fiberglass hulls for lobster boats. Both are small-scale operations employing only a few men.

General Infrastructure

Milbridge is served by Route #1, the main highway in coastal eastern Maine, which runs through the central business district. The overwhelming majority of the businesses in the area are located along the highway. The two canneries in Milbridge are located along the Wyman Road a short distance south of the primary retail business district. Both are located so they are accessible from the water. Lobster pounds, to be discussed below, are located in a variety of locations.

Port Infrastructure

Milbridge has one commercial pier (Jordan Pier) which is used by sardine carriers and lobster boats. The sardine carriers use it as an occasional location to tie up, and the lobster fishermen use it primarily for loading and unloading. In addition there are two private commercial docks. One is owned by Jasper Wyman and Son, Inc. and is used by sardine carriers. The other is owned by Mitchell and Merser, Inc. for landing lobsters.

The areas close to the facilities of Mitchell and Merser, Inc. tend to be favored by lobster fishermen as moorage locations as a matter of convenience, but Milbridge has no single area used for mooring. Instead, boats are moored at any area along the shore of several bays. There are enormous areas which provide suitable moorage locations. Selection thus becomes more a matter of convenience than necessity. The primary moorage areas are along the bays adjacent to the Wyman Road, Pigeon Hill Road, and the Dyers Bay Road. All of these roads extend down peninsulas surrounded by well-protected bays.

Types of Fishing

The largest single fishery in the area in terms of numbers of harvesters involved is clam digging. If processing is considered, the herring industry would involve the largest number of people. Lobstering is next and the taking of groundfish a distant fourth.

Clams

1. Number of People

Between 90-100 people make the largest portion of their incomes from clamming in Milbridge. Milbridge issued 160 clam digging licenses in 1978. Nearby Steuben has approximately as many diggers.

2. Marketing

Clams are sold by the individual diggers to one of seven local buyers. Clam production for Milbridge can reach 320 bushels per day with 160 a more typical figure.

Four of the seven local buyers (Lester Wallace, Gerald Tibbits, Edward Cody, plus Rodney Robinson in Steuben) wholesale clams to buyers primarily in the Boston market. The other three buyers (Neamiha Beal, Irene Chipman, and Cecil Hall in Steuben) also maintain shucking operations and market shucked clams. Of the three, Chipman's operation is quite small and the market local. The others sell to a more extensive market, with the Bay State Company being a major client.

3. Processing

As noted above, clam shucking operations are run by three of the local clam buyers. These operations are quite small, employing between four and ten individuals, with work forces varying in relation to the supply of clams available.

Lobsters

1. Number of Boats, People, and Fishing Areas

Milbridge has roughly 40 lobster fishermen (32 full-time and 6 part-time) with possibly a few more men fishing part-time with very small numbers of traps. As already noted, they are scattered over a relatively large area. Most lobster fishermen discontinue fishing in the winter when moorage areas freeze over, although a few may move their boats to other areas. Thirteen of the men considered full-time lobster fishermen do at least some clam digging.

2. Marketing

Mitchell and Merser, Inc. is the primary lobster buyer in Milbridge. Other pound operators may purchase lobsters locally but only on a sporadic occasional basis.

In all, Milbridge has three active lobster pounds (Mitchell and Merser at 120,000 lbs. capacity, Lyndon Perry with 60,000 lbs. capacity, and Richard Dorr with 12,000-15,000 lbs. capacity). Lyndon Perry obtains lobsters from the Harrington area (where the pound actually is located) eight miles east of Milbridge, and from Bar Harbor, but like Mitchell and Merser makes purchases from a variety of areas. Dorr uses his pound primarily for his own catches or those of a very small number of local fishermen.

In Steuben, there is another small pound owned by Robert West, and a larger pound owned by Williard Kelsey.

Arnold Francis in Steuben has two pounds (over 100,000 lbs. capacity) to add to the total en-pounding capacity in the area. He purchases from a variety of sources, and handles a large number of lobsters imported from Canada.

3. Processing

No processing in the area.

Herring

1. Number of Boats, People, and Fishing Areas

During the 1978 season there were 10 herring weirs under the primary control of seven different men in the Milbridge area. Several of these operators also engage in stop seining when favorable concentrations of herring occur.

In addition to these operations, the L. Ray Packing Company has a sardine carrier capable of operating as a purse seiner. The L. Ray Packing Company has a second craft which is exclusively a sardine carrier. Jasper Wyman and Son, Inc. operates a single carrier.

2. Marketing

Marketing arrangements are, as usual in the industry, made directly between the processors and the fishermen. The primary buyers in the area are the local processors and the Stinson Canning Company, of nearby Prospect Harbor.

3. Processing

Milbridge has two canning operations (Jasper Wyman and Son, Inc. and the L. Ray Packing Company).

Groundfish

1. Number of Boats, People, and Fishing Areas

In the Milbridge and Steuben area, four fishermen otter trawled for groundfish while one employed gillnets during the 1978 season. All used boats in the 36-42 foot class which were primarily designed for lobster fishing. In this area, dragging for groundfish is a seasonal activity (during the spring), and the fishermen rig for lobster fishing during the remainder of the fishing season. In all, about 12 men are involved.

2. Marketing

One of the fishermen also has a small fish buying and shipping business (James Salisbury). He purchases some of the fish landed and ships them to the Boston market. The remainder of the fish caught locally go to the Stinson Canning Company in Prospect Harbor.

3. Processing

No local processing is done.

Minor Fisheries

Marine worms and crabs constitute the remaining fisheries of the Milbridge-Steuben area. Crabs are an incidental catch brought in with lobsters. Most go to the Bay State Company at Bunker's Harbor, which sells them in the Boston market. A crab picking facility at Addison handles some processing. Edward Cody, one of the clam buyers also handles limited quantities of crabs. Finally, some of the fishermen's wives pick some crabs and sell the meat locally.

Marine worms are collected by many of the people who dig clams. These are sold locally to Abe Wonsler of Milbridge and the Maine Bait Company buying station, which in turn ship worms for sport fishing around the country.

Important Institutions Related to Fishing

L. R. Ray Packing Company

This company cans sardines in oil (4 oz. cans) under the company's brand name "Fishermen's Net." The plant was built in the early 1930's and is still owned by the Ray family. At the height of the season the plant employs about 80 people, who come from Milbridge and towns within a 20 mile radius. The company owns a carrier, the "Gary Allen," and a purse seiner called the "Lawrence Wayne."

Jasper Wyman and Son, Inc.

This company owns a sardine packing plant on Leighton's Point about four miles south of Milbridge; it also operates a blueberry factory in the Milbridge area. In the summer, this concern employs about 55 people packing sardines in oil in 4 oz. cans. In the winter, it manufactures pellitized mouse food, which is purchased mainly by laboratories. The concern owns a 64 foot carrier called the "Jasper Wymen."

Distinctive or Unusual Characteristics of the Harbor

The Milbridge-Steuben area has a highly dispersed group of fishermen located along three peninsulas between two town centers. Even by the standards of the highly dispersed fishing populations of Maine, this area has a scattered fishing population.

The large number of lobster pounds in the area is also somewhat unusual. Like the other eastern Maine lobster pound areas, the combination of coves with appropriate configurations and heavy tides to insure water movement make the area attractive for lobster empoundment.

Probably the area's most distinctive feature is its high degree of diversity in economic pursuits. A single individual during the course of a year will commonly combine balsam bough and cordwood cutting, blueberry picking and clam and worm digging. This varied set of economic activities is typical in most of coastal Washington County. It is highly pronounced in this area.

PROSPECT HARBOR

Physical Setting and Population

Prospect Harbor is situated at the intersection of highways #195 and #186 in the township of Gouldsboro (pop. 1028). The hamlet is located five miles east of the Schoodic Point segment of Acadia National Park.

Major Industries and Economic Pursuits

Prospect Harbor is dominated by the Stinson Canning Company which operates a large plant. Except for the cannery, the area has a decidedly rural character. The hamlet itself has a cluster of houses and only a couple of small stores.

General Infrastructure

Aside from highways #186 and #195, Prospect Harbor can only be reached by water. The area is basically rural and lacking features usually associated with urban concentrations, including industrial plants, shopping facilities, and professional services. The primary shopping area for the region is Ellsworth, roughly 30 miles away.

Port Infrastructure

Aside from the Stinson Canning Company facilities, which include well-developed arrangements for handling sardines arriving by truck or sardine carrier, Prospect Harbor has only a few small private docks.

Types of Fishing

There is a very modest amount of lobster fishing plus some local clam digging. The massive Stinson Cannery dominates the community. There are no other fisheries except the occasional tub trawls set for halibut by lobster fishermen in the spring.

Lobster

1. Number of Boats, People, and Fishing Areas

Prospect Harbor has six full-time lobster fishermen and six men who fish part-time. Nearby Bunker's Harbor has an additional six to eight lobster fishermen.

2. Marketing

Catches are sold at nearby harbors (Corea, Winter Harbor, Bunker's Harbor). The McLuen Lobster Company at Bunker's Harbor apparently buys a major portion of the lobsters coming from Prospect Harbor and provides services to most of its fishermen.

3. Processing

There is no processing of lobsters in Prospect Harbor.

Groundfish

Except for a few tub trawls for halibut set by lobster fishermen as an incidental activity, Prospect Harbor has no groundfishing. The Stinson Canning Company did begin buying groundfish (cod, haddock, halibut, hake, and flounder) in late 1977.

Clams

In the town of Gouldsboro as a whole, there are an estimated 75 full-time clam diggers and about 210 part-time clambers. Not all of the part-time diggers have licenses.

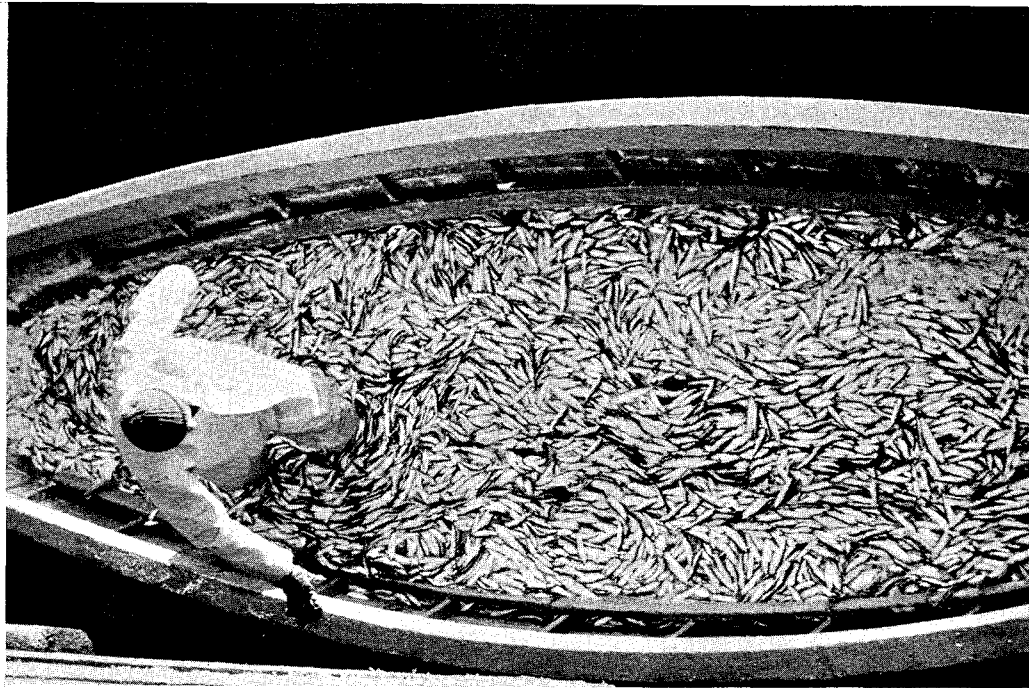
Important Institutions Related to Fishing

Stinson Canning Company

The Stinson Canning Company operates a large, new herring canning plant in Prospect Harbor and maintains its home offices there as well. The Company packs sardines and fish steaks in oil under its own set of brand names. At the height of the season, the plant employs about 125 people, and is clearly the largest employer in the whole region. Herring arrive at the plant via Stinson Company carriers and purse seiners. A very high proportion of the herring packed in this plant are caught in Canadian waters by Canadian boats and weir operators, etc.; brought to the company pumping station in Lubec; and pumped into large tank trucks, which bring them over the road.

In recent years, the company has purchased a large amount of groundfish in the local area from fishermen from Jonesport to Bar Harbor, with the majority coming from the Milbridge to Winter Harbor area. Except for two or three gillnetters, most of the individuals selling to the company are primarily lobster fishermen who set their boats up for otter trawling during the spring.

Weekly poundages of groundfish bought average about 40,000-50,000, with a range of 20,000-80,000 lbs. during the spring. Landing figures drop to zero as the lobster season gets underway. Some flounder are filleted at Prospect Harbor, but most fish are shipped to Rockland for processing by automatic machinery.



COREA

Physical Setting and Population

Corea is a hamlet in the township of Gouldsboro and is located on the east side of the Schoodic Peninsula overlooking Gouldsboro Bay. The community is at the very end of Route 195, about 12 miles from U. S. 1.

Major Industries and Economic Pursuits

Fishing is the primary economic pursuit in the area, with some individuals engaged in woodcutting. There is one large "cottage development" in Corea with about 40 houses, some of which are occupied seasonally, others permanently. There are, however, very few facilities for transient tourists. In the township, there is one set of cabins which are rented in the summer months only.

General Infrastructure

Corea is served by highway #195 and of course can be reached by water. The town is very rural with a scattered population. There are no shopping facilities in the town aside from two small general stores.

Port Infrastructure

Corea has a comfortable small harbor capable of serving many more craft than now frequent it. In addition to a number of private docks, the community has two commercial wharfs. Young Brothers Boat Yard, which employs about 10 men, is also located in the town.

Types of Fishing

The primary fisheries of Corea are lobstering, clamming, otter trawling for groundfish and scallop dredging. Otter trawling and scallop dredging are secondary activities undertaken by lobster fishermen.

Lobster

1. Number of Boats, People, and Fishing Areas

Corea in 1978 had an estimated 62 lobster boats operating. About 40 of these operated essentially full-time while the remainder fished only during the summers. A few skiffs can be added to the total for the summer fishery.

2. Marketing

Most of the fishermen in Corea sell at the local fishermen's cooperative. Seven sell to Don Smith, who operates a small dealership. Many of the lobsters bought by Smith's operation are sold to a local pound operator.

3. Processing

No processing is done in Corea.

Groundfish

Groundfishing is very new in Corea, having started during the 1978 season. Two men who primarily fish for lobsters did some otter trawling during the spring. Catches were sold to the Stinson

Canning Company in Prospect Harbor. Additional lobster fishermen set tub trawls for halibut in the spring and sell catches to Stinson but this is more of an incidental, almost recreational, fishery than a major fishing effort.

Scallops

Six lobster fishermen rigged for scallop dredging (this includes the otter trawlers) during the winter of 1978. This fishery lasts between one and three months depending on the individual, and is viewed as a fill-in activity. Catches of 7 to 10 gallons of scallops are obtainable on a good day. Scallops are handled through the fishermen's cooperative.

Herring

One herring weir was set in Gouldsboro Bay near Corea during the 1978 season. It was the first built in the area in many years.

Clams

Clamming is an important activity in Gouldsboro Bay but no accurate count of clambers is available. It is estimated that about 24 men from Corea earn most of their income clamming, while another 55 earn some of their income from this activity.

Important Institutions Related to Fishing

Corea Fishermen's Cooperative

This cooperative is the largest lobster buyer in the area. It has about 44 members and over 50 fishermen who regularly sell their lobsters to the Co-op in the summer. The Cooperative also handles scallops, but does not buy groundfish. It sells bait, fuel and supplies to men who sell their catches there.

WINTER HARBOR

Physical Setting and Population

Winter Harbor is a hamlet located in the township of Gouldsboro on the west side of the same peninsula as Corea and Prospect Harbor. It is about 3 miles from the Schoodic Point segment of Acadia National Park. In 1970 the township had a population of 1028; Prospect Harbor had only an estimated 300 people.

Major Industries and Economic Pursuits

There is one motel in town, along with three restaurants and three "take out" stands. There are no industrial plants in town. Some residents, however, go to Prospect Harbor to work in the Stinson Canning Co. Plant there.

There is a small Navy base in Winter Harbor which houses a "security group." We have no information on the number of people employed or the mission of this installation.

General Infrastructure

Highway #186 provides road access to Winter Harbor. In addition it can be reached by water. The area around the harbor is relatively densely settled but is basically a rural area without the usual urban infrastructural features. There are four stores in the township--all very small. Most people do most of their shopping and obtain most services in Ellsworth.

Port Infrastructure

In addition to private docks, the harbor has one commercial wharf operated by the Winter Harbor Fishermen's Cooperative.

Types of Fishing

Winter Harbor is primarily a lobster fishing port with a little otter trawling done by lobster fishermen as a secondary activity.

Lobster

1. Number of Boats, People, and Fishing Areas

Winter Harbor has 12 full-time lobster fishermen. All of them use specialized lobster boats (30-42 ft. class). There are another 13 part-time fishermen.

2. Marketing

Lobsters are sold to the Winter Harbor Fishermen's Cooperative. No other buyer exists.

3. Processing

No processing is done.

Groundfish

1. Number of Boats, People, and Fishing Areas

During the spring of 1979 seven lobster fishermen rigged for otter trawling in Winter Harbor.

They all converted to lobstering for the summer.

2. Marketing

Catches were landed and sold in nearby Prospect Harbor to the Stinson Canning Company. This is a major outlet for fish in the area.

3. Processing

No processing is done in Winter Harbor.

Clams

1. Number of People

An estimated 24 men earn most of their income digging clams, and another 115 earn part of their income from clamming.

2. Marketing

The Fishermen's Cooperative in Winter Harbor buys most of the clams produced by local diggers.

3. Processing

None.

Minor Fisheries

In 1979 five men rigged their lobster boats over for scalloping. The scallops were sold to the Co-op. In addition, one lobster fisherman goes stop seining in the summer and fall.

Important Institutions Related to Fishing

Winter Harbor Fishermen's Cooperative

In 1979, this Cooperative had 22 members and a full-time manager. Most of the fish and shellfish caught by fishermen from the area were sold to this Cooperative. The Cooperative purchases lobsters from some 25 men and sells them both wholesale and retail. It also buys fish, clams, and scallops. The fish and shellfish purchased by the Cooperative are transported to Boston and New Bedford markets by Gordon Kelly, a trucker.

HANCOCK AND SULLIVAN

Physical Setting and Population

Hancock and Sullivan are two small towns located at the upper reaches of Frenchman's Bay in east central Maine. Hancock is about nine miles east of Ellsworth on U. S. 1. Sullivan and the hamlets in the township (East Sullivan and West Sullivan) are a little further east on U. S. 1. In 1970 the population of Hancock was 1070; Sullivan had some 824 people.

Major Industries and Economic Pursuits

Both Sullivan and Hancock are tiny, rural communities with no industrial plants and few job opportunities. A good many local men combine worming and clamming with working in the woods in the winter months. Most of the people in the local area who hold steady jobs commute to Ellsworth to work. A few commute as far as Bangor, about an hour away by highway. There are very few facilities for transient tourists in the area. There is one motel in Hancock; none in Sullivan. Unlike so many towns in Maine, the shores of these two townships are not covered with summer cottages. There is one older summer cottage colony at Sorrento on Waukeag Point in the township of Sullivan; another such colony is located at Hancock Point in the town of Hancock.

General Infrastructure

Both Hancock and Sullivan may be reached by automobile on U. S. 1. There is no airport in either town, and the closest rail connection is at Ellsworth, some nine miles to the west. There are three small stores in Hancock and one in Sullivan. Virtually everyone does all their shopping in Ellsworth. Services are obtained in either Ellsworth or Bangor. There are no governmental or industrial installations of any kind in either town.

Port Infrastructure

There are no large concentrations of boats in either town. A few boats are moored in the gut connecting Taunton Bay with Sullivan Harbor. The rest of the boats are scattered along the shores of the townships in small coves, etc. Since both townships are so far inland, there are innumerable small coves which are relatively well-protected. There are no large docks open to fishermen save for the one operated by the Tidal Falls Lobster Pound in Hancock. There are, however, two very large lobster pounds. One owned by Ford's Lobster Pound will hold about 240,000 lbs. of lobster and is one of the largest in the state.

Types of Fishing

The area has no finfishing, and little lobstering. It is a center of worming and clamming, however.

Lobster

1. Number of Boats, People, and Fishing Areas

There are an estimated 14 full-time lobster fishermen in Hancock and Sullivan who operate small one man boats in Frenchman's Bay. None of these men goes fishing all year round. Several take other jobs in the winter months. There are also an estimated 10 to 12 skiff fishermen.

2. Marketing

Most of the lobsters caught by fishermen from Hancock and Sullivan are sold either to Tidal Falls Lobster Pound or to Lyle Ford, another dealer. The large pound owned by Ford Lobster

Pound buys most of its lobsters from other dealers and cooperatives.

3. Processing

None.

Marine Worms

1. Number of People and Areas

In Hancock and Sullivan, there are an estimated 150 men who earn a major part of their income from marine worms. Many of these men dig worms (and a few clams) in the warm months of the year and cut pulpwood or take another job in the winter. Most of the worms are dug in the headwaters of Frenchman's Bay or Blue Hill Bay to the west.

2. Marketing

There are four worm dealers in Hancock and one in Sullivan. The two largest buyers in Hancock are Eastern Bait Company, and the Maine Bait Company's buying station. (See Damariscotta.) Warren Dorr and Richard H. DeRaps buy smaller amounts of worms. Oscar Greeley of Sullivan also buys.

3. Processing

All of these buyers pack their worms in seaweed-filled boxes and ship them by truck and/or air freight all over the United States.

Clams

1. Number of People and Areas

An estimated 60 men from Hancock and Sullivan dig clams. Most of these men also dig marine worms, and take other jobs in the winter. The clam beds are primarily in the tidal coves of the headwaters of Frenchman's Bay or Blue Hill Bay.

2. Marketing

Most of the clams dug in Hancock and Sullivan are sold to Boynton's at Lemoine or Richard H. DeRaps of Hancock.

3. Processing

Both Boynton and DeRaps hire small crews of women to shuck some of the clams they purchase.

Minor Fisheries

There are two herring weirs in the town of Hancock which may be in operation for the 1979 season. A few men from Hancock and Sullivan go to Winter Harbor to work on herring boats and operations there.

Important Institutions Related to Fishing

Lobster Pounds

Three lobster pounds are located in the township of Hancock. One is owned by Ford's Lobster Pounds, and holds in excess of 240,000 pounds of lobster. Ford also manages another pound with a capacity of 80,000 lbs. and the third is owned by Tidal Falls Lobster Pound and holds about 60,000 lbs.

Marine Worm Buyers

There are six large buyers of marine worms in the area. In Hancock there are: Eastern Bait Company, Richard H. DeRaps, Maine Bait Company, and Warren Dorr. In Sullivan, Oscar Greeley buys worms, and in nearby Gouldsboro, there is the Gouldsboro Bait Company.

BAR HARBOR

Physical Setting and Population

Bar Harbor is on the northeast side of Mount Desert Island facing Frenchman's Bay. Except for a small slice of land to the north of Bar Harbor, the community is completely surrounded by Acadia National Park. Bar Harbor has a population of 3716 (1970 U. S. Census).

Major Industries and Economic Pursuits

The economy of Bar Harbor is dominated by the tourist industry. Outside Bar Harbor is located the Jackson Laboratories, an internationally known cancer research facility. A very high proportion of all jobs in the area are in the hotel and restaurant trade, or the service industries serving transient tourists and cottagers. Bar Harbor is also the home of the College of the Atlantic, a Liberal Arts college with some 250 students.

General Infrastructure

The community is served by highways #3 and #233. It also has a ferry terminal for the Bar Harbor to Yarmouth, N. S. ferry (the Bluenose). In addition it has an airport with regularly scheduled commercial service.

The central business district tends to be concentrated along the main routes (#3 and #233) and in the waterfront area. Very few areas of the town do not have some tourist-related businesses. There are some two dozen motels, guest houses and restaurants in the community as well as small retail shops specializing in everything from homemade candy and ice cream to antiques. The vast majority of the business establishments are seasonal. They open in the spring when the tourist season begins and close in the fall when the tourists leave.

Port Infrastructure

Port facilities are elaborate but primarily directed toward the recreational use market rather than fisheries. Because of the international ferry, Bar Harbor has a customs office. There is also a town dock with a visitor's information center. A few fishing boats use this facility for loading and unloading gear (usually during the nontourist season).

In addition, marinas, restaurants and yacht clubs are found in the harbor area. These are all directed toward the tourist and recreational market with virtually no connection to the fishing industry. Two seasonal party fishing boats operate from a dock near the town dock.

Space in the harbor is ample in the off season, but the area becomes congested when recreational craft arrive in substantial numbers during the summer. Bar Harbor is an important yachting center.

Types of Fishing

Bar Harbor has an extremely small number of fishermen, making it difficult to view one fishery as more important than another.

Lobster

1. Number of Boats, People and Fishing Areas

Bar Harbor has five "serious" lobster fishermen and five men who can be considered as part-time or casual fishermen.

2. Marketing

Lobsters are generally marketed to local restaurants, dealers in Southwest Harbor, or to Lydon Perry of Milbridge. One of the lobstermen maintains a small retail outlet in his home where he sells lobsters to tourists.

3. Processing

None.

Minor Fisheries

Only one fisherman does any commercial groundfishing. He has a 50 foot boat and a dredge used for both mussels and scallops. One additional fisherman with a 40 foot boat does some mussel dredging and scalloping. The commercial fisherman also owns trucks and carries on a small filleting operation and marketing business to local stores.

In addition, an estimated 20 men go clamming on a part-time basis. Many of these clams are sold to Tibbetts Shellfish.

Distinctive or Unusual Characteristics of the Harbor

As already noted Bar Harbor has a massively developed tourist business. This virtually submerges all other economic pursuits in the community.

NORTHEAST HARBOR

Physical Setting and Population

Northeast Harbor is located on Mount Desert Island and is roughly 20 miles from Ellsworth. It is near the mouth of Somes Sound on its east bank. The population of the town of Mount Desert, which includes Northeast Harbor, Seal Harbor, and Somes Sound, is 1659 (1970 U. S. Census).

Major Industries and Economic Pursuits

Like Bar Harbor, Northeast Harbor and the surrounding area is dominated by the tourist industry. There is a difference, however. Bar Harbor is oriented toward the transient tourist trade. Northeast Harbor has few motels and restaurants. There are, however, a large number of cottages in the area and several large estates, including one owned by the Rockefeller family. There are no industrial plants of any kind.

General Infrastructure

The area has a heavily developed infrastructure catering to the tourist trade. This includes a wide array of seasonal shops and several motels and restaurants. The town has few food stores, services or professional offices. Thus, local people do much of their shopping in Ellsworth.

This area is served by Routes #3 and #198 as well as being accessible by water.

Port Infrastructure

Northeast Harbor is a well-protected harbor of modest size. It is about 300 yards wide at the mouth and three quarters of a mile long, with shoal waters in its upper reaches. It does have an excellent moorage area roughly 200 yards wide at its lower end and good shallow water moorages near the town dock. The town dock is a small facility generally adequate for loading and unloading materials. It is the only public facility in the harbor. The harbor also has an impressive set of facilities for the yachting trade: the Northeast Harbor yacht club, the Northeast Harbor Marina, and Clifton Dock, another marina.

Types of Fishing

There are very few fishing boats in Northeast Harbor and no fish dealers of any kind.

Lobster

1. Number of Boats, People, and Fishing Areas

There are approximately 12 lobster boats operating from Northeast Harbor on a full-time basis. One of these lobstermen has a stop seine operation. Another four rig up in the winter to go scalloping. In addition, there are about 15 part-time lobster fishermen, most of whom go fishing in skiffs only in the summer.

2. Marketing

Most of the lobsters caught by Northeast Harbor fishermen are sold in Southwest Harbor or Bass Harbor.

3. Processing

None.

Herring

1. Number of Boats, People, and Fishing Areas

There are two crews in Northeast Harbor who do a substantial amount of stop seining. One boat purse seines as well.

2. Marketing

Most herring caught by Northeast Harbor fishermen are sold to the Stinson Canning Company plant at Southwest Harbor.

3. Processing

No local processing.

Minor Fisheries

There are four boats in the 36-42 foot class that do several types of fishing over the course of the year. One purse seines; and two others are involved in stop seine operations. These boats also do some otter trawling and scallop dredging in the winter. One of these boats takes out fishing parties.

SOUTHWEST HARBOR

Physical Setting and Population

Southwest Harbor is on the south side of Mount Desert Island near the mouth of Somes Sound on its western bank. It is adjacent to the westernmost segment of Acadia National Park. Southwest Harbor has a population of 1657 (1970 U. S. Census).

Major Industries and Economic Pursuits

As in most harbors in the area, Southwest Harbor is heavily dominated by the tourist industry.

General Infrastructure

The Southwest Harbor area has a well-developed infrastructure catering to the tourist trade. Major developments include seasonal motels and guest houses, restaurants and small shops. Businesses tend to be concentrated along the main road which passes through the central business district and around the harbor.

Port Infrastructure

Southwest Harbor has very good anchorage with deep water and ample room. The harbor possesses an impressive collection of marinas and boat yards catering to the recreational market. In addition, a ferry service operates between the harbor and Cranberry Isle. Southwest Harbor also has a U. S. Coast Guard Station.

There are three town docks. One serves the Cranberry Isle ferry as well as fishermen and recreational boaters. The second is used more by fishermen than recreational boaters. An additional town dock is located across the harbor from the main wharf concentration. This is also used by fishermen. Added to these facilities are the private facilities of the fish buyers in the harbor. These are of course accessible to fishermen.

Types of Fishing

Lobstering is the largest fishery in Southwest Harbor. This is followed by scalloping, with crabbing and fin fishing being essentially incidental fisheries. Herring processing is significant in the community but local herring fishing is not.

Lobster

1. Number of Boats, People, and Fishing Areas

Between 30 and 35 boats fish for lobsters from Southwest Harbor throughout most of the year. Another 15 part-time fishermen operate from the harbor in the summer.

2. Marketing

The two large buyers in the harbor are H. R. Beal and R. D. Lunt. Both purchase lobsters and scallops. Lunt also handles limited quantities of crabs.

3. Processing

No processing is done.

Scallops

1. Number of Boats, People, and Fishing Areas

Scalloping is done during the winter by men who fish primarily for lobsters. Four to six boats usually fish for scallops during the winter.

2. Marketing

H. R. Beal purchases most of the scallops landed although R. D. Lunt does purchase some.

3. Processing

No processing is done on shore. The scallops are shucked on the boats.

Minor Fisheries

One local lobsterman also has a stop seine operation. Some lobster fishermen land crabs as an incidental catch which are purchased by R. D. Lunt. In addition about six men from town do substantial amounts of clamming although only three could be considered full-time clambers.

Important Institutions Related to Fishing

H. R. Beal and Sons, Inc.

This company operates a lobster dealership from its dock next to the Coast Guard station on the northern shore of Southwest Harbor. In the summer, about 30 fishermen sell their catches to the company; approximately 22 of these men have inboard-powered, standard lobster boats; the rest have skiffs. Most come from Southwest Harbor itself, but a sprinkling of men from Northeast Harbor, etc. also sell here. The firm supplies bait and fuel to its fishermen.

R. D. Lunt

Another 25 lobster fishing boats sell their catches to this company. R. D. Lunt also buys crabs from its fishermen and supplies them with fuel and bait.

Village Electronics

This company, which employs eight people, was begun in 1975, and operates from a building near the Coast Guard station on the north side of Southwest Harbor. It sells and services several different types of marine electronics, including Loran, radar and fish finding gear. It also handles T.V., radio, and electric pumps.

Stinson Canning Company

The Stinson Canning Company plant was built in the 1930's at the head of Southwest Harbor. The plant employs about 110 people and does nothing but can herring steaks and herring fillets in oil in 3 3/4 oz. cans.

U. S. Coast Guard

There are two types of operations carried out at this station. First, Southwest Harbor is the Headquarters of one of the four "Groups" in the U.S.C.G. First District. This Group Command controls all activities between the Canadian border and Port Clyde, Maine. Under the Captain in charge is the station at Jonesport, and the large station at Rockland, as well as the Southwest Harbor Station. Second is the Southwest Harbor Base which has an Aids to Navigation team which maintains buoys etc. in the area (aided by a 46 foot buoy boat) and also a Search and Rescue Unit which has a 65 foot seagoing tug boat, the "Bridle," and three smaller boats: a 44 foot life boat, a 41 foot utility boat, and a 21 foot boat.

BASS HARBOR

Physical Setting and Population

Bass Harbor and Bernard face each other across the harbor which serves both. Both are part of the town of Tremont which has a population of 1003 (1970 U. S. Census). Tremont is on the southwest corner of Mount Desert Island.

Major Industries and Economic Pursuits

As in virtually all communities on Mount Desert Island, tourism is the dominant industry in the area. Unlike most other communities in the area, fishing, particularly lobstering, is also a significant economic pursuit.

The Tremont area does not have a lot of motels and restaurants, etc. serving transient tourists. There are, however, a good many seasonal and retirement homes. The area also has several boat yards (i.e. James Rich Boatyard, Power and Robinson, Stanley Boatyard, and Bass Harbor Boatyard) and a machine shop (i.e. Power and Robinson) which employ an estimated 50 people.

General Infrastructure

Highway 102 serves the area, connecting it with Ellsworth approximately 30 miles away. Ellsworth is the primary retail shopping area for the Tremont area as it is for the rest of Mount Desert Island. Bass Harbor has no large stores or professional offices.

Port Infrastructure

A state run ferry operates between Bass Harbor and Swan's Island and Long Island. It uses its own terminal. Adjacent to the ferry terminal is a small town dock used mainly by boaters.

In addition to a number of private docks, fishermen have access to the facilities of the three buyers in the harbors. One is on the Bass Harbor side of the harbor and two are on the Bernard side. Bass Harbor Marine operates a marina with ice, fuel, and other services for the yachting trade.

Bass Harbor has a spacious harbor with ample water depth. It is well-protected. It does have rock ledges obstructing the middle of the harbor mouth, but these are marked and easily avoided.

Types of Fishing

The most important fishery in the Bass Harbor area is lobstering. This is followed by scalloping, crabbing, clamming and groundfish, but not necessarily in that order. Scalloping and crabbing are both secondary fisheries to lobstering, as is most of the groundfishing.

Lobster

1. Number of Boats, People and Fishing Areas

In all there are approximately 60-65 lobster fishermen in the area. These men use specialized lobster boats between 30 and 44 feet in length. In addition there are a number of skiff lobster fishermen; the number is not known, but it is not large.

2. Marketing

C. H. Rich Company, Inc., F. W. Thurston Company and Damon Enterprises, Inc. are the three lobster buyers in the area. C. H. Rich, serving 35 lobster fishermen, is the largest dealer

and lands about twice the poundage of lobsters as F. W. Thurston. F. W. Thurston serves about 30 fishermen. The remainder sell to Damon Enterprises. Most of the lobsters landed in Bass Harbor eventually go to the Boston market.

3. Processing

No processing is done in the area.

Scallops

1. Number of Boats, People, and Fishing Areas

About 20 boats convert from lobstering to scalloping during the winter. Of these 10-12 do the vast majority of the scalloping.

2. Marketing

F. W. Thurston, Damon Enterprises, and C. H. Rich purchase virtually all of the scallops landed.

3. Processing

No processing is done beyond shucking on the boats.

Crabs

1. Number of Boats, People, and Fishing Areas

Crabs are landed as an incidental catch by most of the lobster fishermen in the area. In addition crabs are brought in from surrounding areas.

2. Marketing

C. H. Rich is the major crab buyer in the area. Damon Enterprises and F. W. Thurston also purchase crabs but resell them to C. H. Rich. Most crabmeat eventually goes to the Boston market.

3. Processing

C. H. Rich has a crab picking facility.

Clams

1. Number of People

An accurate count of the clam diggers in the area is virtually impossible to obtain. Clamming tends to be an occasional part-time activity for most of those involved in it. There are probably 15 relatively serious diggers in the area (making substantial portions of their incomes from the activity). There are probably 100 occasional diggers.

2. Marketing

C. H. Rich is the major clam buyer in Bass Harbor, although substantial numbers of clams are sold to Mount Desert Shellfish, the largest clam buyer on the Island.

3. Processing

Only a few clams are processed for sale by C. H. Rich in his own small seafood market.

Groundfish

1. Number of Boats, People, and Fishing Areas

Bass Harbor has three boats groundfishing (two otter trawling and one gillnetting). One otter trawler operating from Southwest Harbor also lands fish in Bass Harbor. All of these boats are between 36 and 44 feet in length. The small otter trawlers have the usual two man crews and the gillnetter uses three.

2. Marketing

C. H. Rich is the largest buyer of groundfish in the area, although recently Damon Enterprises has begun to buy groundfish as well.

3. Processing

C. H. Rich has a small filleting room in his facility and Damon Enterprises also fillets some groundfish.

Distinctive or Unusual Characteristics of the Harbor

Bass Harbor has the largest fishery on Mount Desert Island. Crabmeat production on the scale found at Bass Harbor is unusual by standards anywhere on the coast.

Important Institutions Related to Fishing

C. H. Rich Company, Inc.

This company buys and processes a large variety of seafood. It operates a lobster buying station and supplies fuel and bait to some 35 fishermen. The company also buys a lot of crabs and operates a crab picking house. About 500,000 lbs. of crabs are picked annually, yielding 40,000 to 50,000 lbs. of crabmeat. Between 5 and 15 local women are employed as crab pickers, depending on the volume of crabs being processed. The company is the major clam buyer in the area and purchases some 20 bushels of clams on an average day. C. H. Rich also is the only groundfish buyer in the area. Morris Rich, the owner, and an occasional helper attends to the filleting. The company sells its products both wholesale and retail. The company's small retail shop sells all the groundfish fillets cut, as well as shucked clams, crabmeat, and lobsters. Most of the fish sold on the wholesale market is shipped to the Boston market.

Cranberry Islands Fishermen's Cooperative

A small cooperative was started on Cranberry Islands in 1978. These islands are located about five miles from Bass Harbor at the entrance to Somes Sound. There are approximately 12 members. The Cooperative deals in nothing but lobsters, and furnishes its fishermen with bait and fuel.

SWAN'S ISLAND

Physical Setting and Population

Swan's Island is located about four miles southeast of Bass Harbor, and about six miles due east of Stonington. The island is about five miles long and almost four miles wide at the widest point. The island is an independent township. It has three hamlets where most of the permanent population live: Atlantic on the northern part of the island; and Swan's Island and Minturn along Burnt Coat Harbor on the southern part of the island. In 1970, the year round population of the island was 490. In recent years, however, a large number of summer cottages have been built on the shore. The summer population of the island is estimated at 900.

Major Industries and Economic Pursuits

Fishing is the major industry of Swan's Island. There are no industrial plants of any kind, and no facilities for transient tourists either, save for a couple of small rooming houses. In recent years, about 130 "summer camps" have been built on the island, which has provided jobs for three crews of carpenters. There are two small road contracting firms which maintain the island's road system. There are only two small stores on the island, and one small take-out food stand. Five men are employed by the Fisherman's Cooperative, the largest single employer on the island.

General Infrastructure

The Maine State Ferry Service runs an automobile and passenger ferry service between Bass Harbor and Mackerel Cove on the northern side of Swan's Island. The ferry runs four times a day in the winter and six times a day in the warm months of the year. There are about 20 miles of highway on the island. Approximately eight miles of this road system (between Atlantic and Burnt Coat Harbor) are paved. The township maintains an elementary school with three teachers. As in so many other island communities, the children from Swan's Island go to high school on the mainland, and the State of Maine pays the tuition. Most students go to high school on Mount Desert Island or to Gould Academy.

Islanders do some of their shopping in the two small general stores on the island; but most families go to the mainland several times a month to get most of their food and other supplies. Most go shopping in Ellsworth, but some people regularly go all the way to Bangor.

Port Infrastructure

There are two anchorages in general use on Swan's Island. About six boats are regularly moored at Mackerel Cove in the summer. The large Maine State Ferry terminal is located here, and beside it is a launching ramp and float maintained by the township.

Most of the boats are kept at Burnt Coat Harbor on the southeastern side of the harbor. Twelve boats are moored on the Minturn side and about thirty near the cooperative on the Swan's Island side. Burnt Coat Harbor is about 1.5 miles long and about 450 yards wide. It is a well-protected anchorage since it is surrounded by high land on all sides and Harbor Island sits in the middle of the harbor entrance. There are three large wharfs along Burnt Coat Harbor. There is a town wharf at Minturn, which is in very bad condition. On the Swan's Island side of the harbor is the Swan's Island Fisherman's Co-op and close by is Kent's Wharf, owned by a private lobster buyer. Most of the lobsters and fish caught by island fishermen are landed at these two wharfs on the Swan's Island side. In Burnt Coat Harbor, near Hockamock Point, is the Burns Boat Yard, which has a marine railway and storage for about 25 boats. At the entrance of Burnt Coat Harbor (on Hockamock Point) is the Burnt Coat Harbor Light, an unmanned lighthouse.

Types of Fishing

Lobstering is the major type of fishing done on Swan's Island. In recent years some fishermen

have rigged their boats up for winter scalloping.

Lobster

1. Number of Boats, People, and Fishing Areas

There are 49 lobster boats on Swan's Island. Forty-two of these are between 30 and 40 feet long. Only one boat is over 40 feet long, and there are only four skiffs regularly used around the island.

Only nine of these fishermen are considered "part-time fishermen." Four of these part-timers are retired from some other occupation; the other five earn part of their income through some other occupation, such as carpentry, truck driving, or marine engine repair.

2. Marketing

All of the lobsters caught by Swan's Island fishermen are sold to the Swan's Island Fisherman's Cooperative or to Kent's, an independent lobster dealer. About 39 fishermen belong to the Cooperative. Only eight or nine men regularly sell their catches at Kent's Wharf. Fishermen can buy bait and gas at both the Cooperative and Kent's Wharf. Most of the lobsters bought by the Cooperative are sold to Heansslers' on Deer Island.

3. Processing

None.

Scallops

1. Number of Boats, People, and Fishing Areas

In the winter, 14 boats from Swan's Island go scalloping. Most scallops are dragged between January and March in tows within five miles of the island itself. One boat, however, has been dragging for scallops throughout most of the year: around Swan's Island in the winter and off Chatham, Massachusetts in the summer.

2. Marketing

All scallops produced by Swan's Island boats are sold to the Fisherman's Cooperative, which in turn markets them to seafood wholesalers on the mainland. Most are sold to M.D.I. Shellfish in Bass Harbor.

3. Processing

All scallops are shucked on board, and sold by the gallon. No further processing is done on Swan's Island.

Minor Fisheries

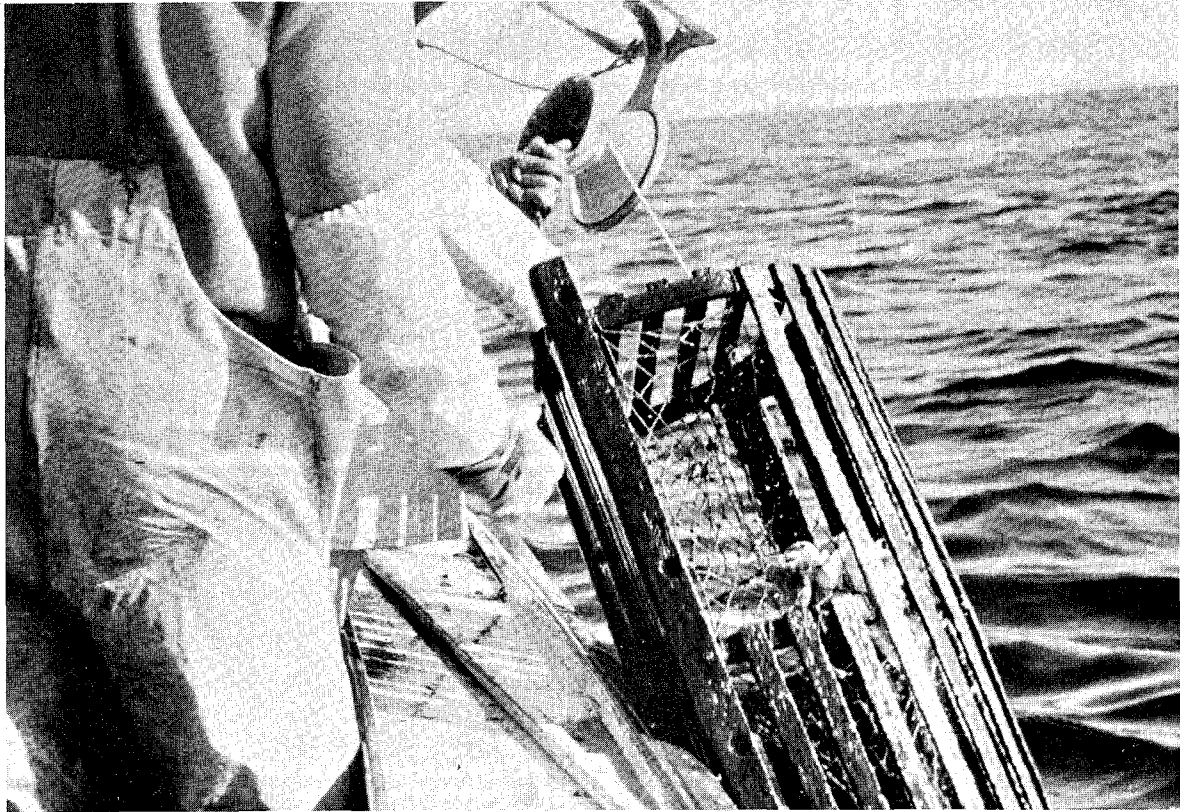
In the recent past one fisherman maintained a stop seine operation. In the past year, he has given up seining in favor of scalloping on a year round basis.

One or two local fishermen dig clams on the island on a part-time basis. A few clambers from the Waldoboro area also visit the island periodically to dig clams.

Important Institutions Related to Fishing

Swan's Island Fisherman's Cooperative

This cooperative, formed in 1971, currently has about 40 members and five employees, including a full-time manager. It maintains a large dock on the west side of Burnt Coat Harbor and two buildings: one is used as a bait shed, the other as an office and supply store. The Cooperative supplies both fuel and bait to its members throughout the year. It buys both lobsters, which it generally markets to Haenssler on Deer Island, and scallops in the winter months, which are generally sold to M.D.I. Shellfish in Bass Harbor.



BLUE HILL AND BROOKLIN

Physical Setting and Population

Both of these tiny towns are located on the western shore of Blue Hill Bay, in the east central part of the Maine coast. Blue Hill had 1367 people in 1970 and is the shopping and service center for the area. It lies on the shore about 10 miles southwest of the city of Ellsworth. Brooklin is a very rural community of 598 located about 15 miles further south of Blue Hill. The little hamlet of Brooklin itself (population 200) overlooks Eggemoggin Reach, which lies between the mainland and Deer Isle.

Major Industries and Economic Pursuits

There are no industrial plants or governmental agencies in either town and little fishing. An indeterminate number of people from these two towns go to Bucksport to work in the St. Regis Paper Company Mill there. Blue Hill does have a number of stores, shops, tourist facilities, and service businesses, which provide employment for local people. The success of Blue Hill's business establishments is due to the fact that the area has a sizeable "retirement colony." A large number of scattered old houses and farms have been bought by retirees and "other-out-of-staters." Some of these people are wealthy, and many stay in the area on a year round basis.

General Infrastructure

Blue Hill and Brooklin may only be reached by highways #176, #175, and #172, very small state highways, which connect various parts of the Blue Hill peninsula with U. S. 1 to the north. There are no airports or railroad spurs in the immediate area.

Brooklin has no commercial establishments save for a couple of small general stores. Blue Hill has a small commercial section with two good-sized food stores, beauty shops, a drug store, a department store, some craft stores, a hospital, and doctors and dentists. It also has two restaurants and a motel. While many residents of the area do a lot of their shopping and obtain many services in Ellsworth or Bucksport, 15 or 18 miles away, Blue Hill offers a large number of services for a town of its size.

Port Infrastructure

Blue Hill has a large, spacious harbor, which could accommodate many more boats than are currently moored there. The outer harbor (to the east of Parker Neck) has ample water for large boats; the inner harbor is very shallow, and considerable portions drain at low tide. There is a town landing in the inner harbor, but there are no commercial wharfs. The harbor is used, in the main, by yachtsmen, who moor their boats near Parker Head, about 1/2 mile from the center of Blue Hill. The only commercial maritime activity of note is Blue Hill Yacht sales, which sells pleasure boats.

In Brooklin, boats are moored in two very small harbors: in the hamlet of Brooklin, and off Naskeag Point. Both harbors are well-protected by virtue of the fact that Deer Isle lies between them and open ocean. Neither is capable of accommodating more than a few dozen small boats. Brooklin Harbor has a boat yard (Brooklin Boat Yard), and one other wharf. There are no wharfs of any kind at Naskeag Point. Fishermen and others using this anchorage get on their boats by using skiffs, which are pulled up on the beach when they are not in use. There is no fish buyer located at either harbor.

Types of Fishing

Lobster

1. Number of Boats, People, and Fishing Areas

At Blue Hill there are approximately four standard powered lobster boats whose owners use them on a part-time basis in the summer and fall. There are also another three boats moored at South Blue Hill. In Blue Hill as a whole, there are another six to eight skiff fishermen.

In Brooklin, there are three inboard-powered lobster boats moored at Center Harbor near the hamlet of Brooklin and another six lobster boats moored at Naskeag Point. There are perhaps another ten skiff fishermen as well.

2. Marketing

There is one small-scale lobster buyer in Blue Hill, who does not have a wharf and who sells most of his lobsters retail in the summer. Most of the lobster fishermen with big boats sell their catches to dealers on Deer Isle--particularly Haenssler's at Sunshine.

3. Processing

None.

Scallops

1. Number of Boats, People, and Fishing Areas

Four lobster boats from Brooklin regularly rig up for scalloping in the winter along with another three boats from Blue Hill. One of the boats from Blue Hill is about 40 feet long and does nothing but drag for scallops and groundfish depending on the season.

2. Marketing

Phil Wood, a small dealer, buys clams and scallops in Brooklin. Other scallops produced by fishermen from Blue Hill and Brooklin are sold to dealers on Deer Isle or to Jeff's Lobsters in Bucksport.

3. Processing

None.

Minor Fisheries

An estimated seven men from Blue Hill and Brooklin earn a high percentage of their income digging clams while another 28 men go clamming on a part-time basis. Periodically, however, larger numbers of diggers from out of town invade local clam flats, a sore point with local people. A lot of the clams dug locally are sold to Phil Wood of Brooklin.

Some marine worms are dug in local areas by people from other towns.

Important Institutions Related to Fishing

Boatyards

The area has one of the largest concentrations of boatyards in Maine. They are widely scattered and not apparent to the casual visitor. Webber Cove Boatyard, in East Blue Hill, produces

fiberglass hulls in its East Blue Hill yard which are used in the production of a variety of different kinds of small fishing boats. The company employs between 6 and 8 men.

There are three boatyards in Brooklin. 1. Duffy and Duffy, which employs 3 to 5 men and makes small fiberglass hulls. 2. Brooklin Boatyard, which again has 3 to 5 employees, but makes both wood and fiberglass hulls. 3. Western Boatyard, a very small operation making wooden hulls.



STONINGTON AND DEER ISLE

Physical Setting and Population

The towns of Stonington and Deer Isle are located on Deer Island which is at the end of a large peninsula and island formation which juts south approximately 35 miles from the mainland. The island is connected to the mainland by a large bridge. Penobscot Bay lies to the west and Jericho and Blue Hill Bays to the east.

The town of Stonington is the commercial center for fishing for the entire island area. The town of Deer Isle is located at the northern end of Deer Island and includes the small hamlets of Deer Isle, Little Deer Isle, Sunset, and Sunrise.

Stonington has a population of 1291 (U. S. Census 1970), and Deer Isle a population of 1211. According to informants, the population has grown greatly since 1970--particularly since a large number of retirees have moved to the island.

Major Industries and Economic Pursuits

Stonington, once called "Granite Town," was once a focal point of the granite quarrying industry in Maine during the late 19th century and early 20th century. Although the last quarry closed in the 1960's, the town still retains its proletarian flavor.

At present, Stonington, on the southern end of Deer Isle, is dominated by the fishing industry. It has two restaurants and two motels for transient tourists, but is not mobbed by tourists as are many of the communities on Mount Desert Island. There are no industrial plants. There are, however, four boat yards, two of which are very large. Deer Isle has a more dispersed population. Most of its people are employed in fishing and clamming.

General Infrastructure

Stonington is served by highway #15 and a small airport. A ferry service also operates between Stonington and Isle Au Haut located a short distance south.

The primary business district is located in the waterfront area. Stonington has a basic range of retail services from supermarkets to clothing stores. Most are of very modest size. Most local people regularly go to Ellsworth to shop and obtain services.

Deer Isle, by way of contrast, has 3 widely separated hamlets (Deer Isle, Sunrise and Sunset) none of which have a shopping center.

Port Infrastructure

Most of Stonington's port facilities are oriented toward the fishing industry. The exceptions are the town wharf, which is primarily used as a small recreational boat wharf, and the Atlantic Avenue Hardware, Inc. facility. This is used as a landing site for the Isle Au Haut ferry.

There are a good many piers and wharfs available to fishermen. The most important are those owned by the Stonington Fishermen's Cooperative, Colwell Bros. Inc., L. Clyde Conary, the Port Clyde Packing Company, Fifield's Lobster Company, Billings Diesel Marine Services, and the Lobster Transport Company. There is also a large hardware store specializing in marine supplies.

The town of Deer Isle's three hamlets (Deer Isle, Sunrise and Sunset) all have small harbors. Only Sunrise, however, has a good harbor with a sizeable number of boats

Types of Fishing

Lobstering is the largest fishery in the area. Scalloping is second in terms of dollar value, while clamming is second in terms of people involved. Clamming is a large industry, followed by mussel dredging. There is one herring cannery in Stonington. In recent years an increasing number of men have gone groundfishing--especially in the spring.

Lobster

1. Number of Boats, People, and Fishing Areas

There are probably about 300 lobster fishermen in Stonington and Deer Isle, making it one of the largest lobster fishing regions in the State of Maine. Accurate figures on the number of specialized lobster boats fishing in the area are lacking but there are probably over 250. Stonington also has one boat engaged in offshore lobstering, which regularly sells its catch in Portsmouth, N. H.

2. Marketing

Stonington has a multitude of lobster buyers. The Stonington Co-ops #1 and #2 are the largest in the area, accounting for 125-130 men and over 90 boats. L. Clyde Connary is the second largest dealer. Smaller concerns include the Lobster Transport Co., Colwell Bros. Inc., Fifield's Lobster Co., plus two or three small individual operations. Haenssler's in Sunshine also buys a lot of the area's lobsters.

3. Processing

None.

Clams

1. Number of People

There were approximately 191 clam digging licenses issued in 1979 to people in Deer Isle and another 220 in Stonington itself. Of these, approximately 250 went to full-time clam diggers while another 100 went to individuals engaged in it as a serious part-time activity. The rest are inactive or non-commercial diggers.

2. Marketing

There are six outlets for clams in Stonington. Douglas Hardy and Ralph Carter are the largest buyers, with Eugene Joyce, Jr., Colwell Bros., Curtis Haenssler and the Lobster Transport Co. also purchasing clams.

3. Processing

Ralph Carter and Eugene Joyce operate clam shucking houses employing six to eight women.

Scallops

1. Number of Boats, People, and Fishing Areas

The Stonington, Deer Isle scallop fleet is the largest on the Maine coast. Stonington and Deer Isle had 57 boats which engaged in some scallop dredging in 1978-79. These range from 36 to 72 feet in length. With the exception of one 65 ft. and one 72 ft. boat, all are 44 feet in length or under. The vast majority are used for lobstering most of the year. Two or three men is the typical crew size on the smaller boats. However, 11 of these boats spend the summer fishing in the Cape Cod area. The waters near Stonington are closed to scalloping at this time of the year. These boats spend the winters in the waters near Stonington when

the local season is open and when waters off Cape Cod are too rough for small scallop boats.

2. Marketing

Major local buyers are Colwell Bros., Stonington Lobster Co-op #2, Clyde L. Conary, Curtis Haenssler and Douglas Hardy. As already noted, scallops are a very seasonal product, being landed only in the winter, so all of the buyers also engage in other purchase activities.

3. Processing

The Cooperative processes, packs and freezes scallops for sale to both retail and wholesale markets.

Mussels

1. Number of Boats, People, and Fishing Areas

Thirteen boats engaged in mussel dredging during 1978. These are all lobster boats (30-36 ft.) which were rigged for dredging. A two man crew is usual.

2. Marketing

Douglas Hardy is the only mussel buyer in the area. The mussels are transferred from the boats to waiting trucks over the facilities of the Stonington Lobster Cooperative #1. Its facilities are utilized, but the Cooperative is not involved in the business.

3. Processing

No processing is done locally.

Crabs

1. Number of Boats, People, and Fishing Areas

Lobster fishermen land crabs as an incidental catch. There is no specific crab fishery, although the quantities landed are substantial.

2. Marketing

Most of the lobster buyers purchase crabs for resale to the Stonington Cooperative #2.

3. Processing

The Stonington Lobster Cooperative #2 has a crab picking facility. Up to 18 people are employed processing crabs.

Groundfish

1. Number of Boats, People, and Fishing Areas

Ten boats were involved in groundfishing from Stonington in 1978. Three were otter trawling, while the remainder were gillnetting. Three of the gillnetters were from surrounding areas but landed fish at Stonington because it was the best marketing location in the area. All of the boats were between 36 and 42 feet in length. Most also engage in lobstering and some also do some winter scallop dredging.

2. Marketing

The Stonington Cooperative #1 is the major groundfish buyer in Stonington. Most of the fish

landed go to buyers in Boston. The Co-op handles roughly 2-2.5 million pounds of fish annually, making it the largest groundfish market east of Rockland. Douglas Hardy also purchases some groundfish as well.

3. Processing

Fish are packed on ice and shipped. No processing is done.

Herring

1. Number of Boats, People, and Fishing Areas

There are four stop seining crews and three purse seiners in the area.

2. Marketing

As in most areas, sales are made directly to processors. With processing facilities in Rockland, Stonington and Southwest Harbor (all relatively close by water) there is a wide range of choice in markets.

3. Processing

The Stonington Packing Co. owned by Port Clyde Foods, Inc., is the only herring processing facility in Stonington.

Important Institutions Related to Fishing

Boat Yards

There are two large firms in Stonington building and repairing substantial numbers of fishing vessels. First, there is Billings Diesel Marine Service, Inc. which operates year-round with about 25 full-time employees. This firm has six floats, with dry storage for some 50 boats and moorings for wet storage. It operates a marina which supplies fuel and electricity to visiting boats. The firm also has four marine railways, a crane, and a very large shed for building boats. Second, Northeast Boat Company recently moved to Stonington from New Hampshire. The company is not yet in full operation. However, it is building several different kinds of fishing vessels, including a 54 foot fiberglass hull.

L. Clyde Conary

This company operates a pound in the Stonington area and has one of the largest lobster dealerships in the state. An estimated 55 fishermen regularly sell lobsters to this firm. The company also buys scallops, and supplies fishermen with fuel, bait and marine supplies

Curtis Haenssler

Haenssler operates a lobster dock in nearby Sunshine in the town of Deer Isle. At least 50 local fishermen sell to this firm, along with the Swan's Island Fishermen's Cooperative. The firm supplies fishermen with fuel and bait. It also owns a pound in the Stonington area.

Stonington Fisherman's Cooperative

This Cooperative is one of the largest and most successful in the state. Approximately 150 fishermen are members of the Cooperative and regularly sell there. About 125 of these fishermen are lobstermen primarily, although the Cooperative also buys scallops and crabs. It is the only groundfish buyer in the Stonington area. The Cooperative owns two docks called Docks "1" and "2;" it also regularly uses one of the local lobster pounds to store its catch.

Stonington Packing Company

This company is owned by Port Clyde Foods, which in turn has recently been purchased by Zapata Foods of Houston, Texas. The plant employs about 100 people canning sardines in oil, tomato sauce, spices, etc. It occasionally packs small amounts of mackerel and alewives. In the winter of 1978, it was experimenting with packing squid. Two herring smacks are regularly stationed at this plant: the "Novelty" and "Betsy and Sally."

Distinctive or Unusual Characteristics of the Harbor

Stonington is physically one of the more isolated harbors in Maine. It is on the tip of an island which is on the tip of a very long peninsula. To go to any city of any size from Stonington is at least a 70 and more typically a 110 mile trip over relatively slow highways.

It is also a harbor in which fishing is the dominant industry. The range of high volume fisheries in Stonington is greater than in almost any other harbor in the state. It has a very large lobster fishing fleet plus scallop, clam, crab and groundfish fisheries all larger than in the vast majority of Maine's harbors. In addition, it has a herring processing plant.



ISLE AU HAUT

Physical Setting and Population

Isle au Haut is an island seven miles long and two and a half miles wide, lying south of Deer Isle on the eastern side of Penobscot Bay. It is about 6 miles (40 minutes by mail boat) from the dock at Stonington. Half of the island is a part of Acadia National Park and is owned by the Federal Government. There are 55 to 60 permanent residents and about 250 people living on the island during the summer. There is one cluster of houses and the store at the Isle au Haut thoroughfare, and another cluster of houses at Head Harbor, on the south side of the island. The summer cottages are scattered all along the shore.

Major Industries and Economic Pursuits

Isle au Haut is a very isolated rural community with very few job opportunities of any kind. There are no industrial plants on the island. Most of the permanent male residents are fishermen. Several others are retired. There is a store and gas station, an electric company, a sawmill, one U. S. Park Service Warden, and a small boat yard. All of these activities together provide full or part-time employment for another six or eight men.

Only three or four fishermen earn part of their income as "caretakers" for summer people. Unlike other sections of the Maine coast, the summer community has not grown in recent decades. The summer residents are not wealthy estate owners, but they have not sold large amounts of island land either.

General Infrastructure

Isle au Haut can only be reached by boat. The mail boat runs between Stonington and the island several times a day in the summer and once a day in the winter. The boat carries passengers and cargo, but no automobiles. There is only one small store on the island. Isle au Haut people go to Stonington, Bucksport, or Bangor (the latter being three hours away) to do most of their shopping and obtain most of their services. The community has a diesel-powered electric generating plant owned by local people and some of the "summer people."

Half of the island is part of Acadia National Park, and is maintained by the Federal Government in a natural state. There are no large buildings in the park, no camp sites, and only one ranger. People who come to visit the park must leave the same day by boat as there are no motels or other accommodations on the island.

Port Infrastructure

All of the boats used on Isle au Haut, save for a few owned by summer people, are moored in the Isle au Haut thoroughfare, between Kimball Island and Isle au Haut. Although it is open to the ocean at both ends, the long narrow thoroughfare provides reasonable protection. The town dock, the only large wharf on the island, is also located near the north end of the thoroughfare. This wharf is used by the mail boat, fishermen, and other craft visiting the island. Virtually all passengers and cargo coming or leaving the island pass over this one wharf. There is no marina, marine railway, or other service facility located on Isle au Haut.

Types of Fishing

Most of the fishermen on Isle au Haut are engaged in lobstering. Herring fishing is of secondary importance. There are no draggers on the island, nor do any people earn their living clamming or digging marine worms.

Lobster

1. Number of Boats, People, and Fishing Areas

There are 14 lobster fishermen on Isle au Haut with inboard-powered boats, who fish at least nine months a year. Three of these men go lobster fishing all year round. Several of them earn some of their income at part-time jobs (being caretakers, herring fishing). Two of them go to Jonesport in the winter to work in boat building shops there. The lobster fishermen from Isle au Haut generally fish around the island in areas which are also fished by Stonington lobster fishermen. Isle au Haut fishermen maintain no exclusive fishing areas.

2. Marketing

All of the lobsters caught by Isle au Haut fishermen are marketed in Stonington. Most of the fishermen from the island are members of the Stonington Cooperative and regularly sell their lobsters to the Co-op and obtain their gas and bait there as well.

3. Processing

None.

Herring

1. Number of Boats, People, and Fishing Areas

Two of the men who earn most of their income lobstering also own weirs, which are located in coves on the north end of the island. Two other island lobstermen and two other Stonington fishermen also do stop seining in various coves around the island. All told, there are five stop seine "berths" around the island.

2. Marketing

One of the weir operators has ties to the Stinson Canning Company. The other sells to a variety of factories. One of the stop seiners from Stonington generally sells to the Port Clyde Canning Co. plant in Stonington.

3. Processing

No herring are processed on Isle au Haut.

Minor Fisheries

There is one 37 foot boat, which was dragging for scallops throughout 1978-79. In the winter months, this boat drags near Isle au Haut inside the 12 mile limit. After April 1st, it drags outside the 12 mile zone, where scalloping is legal.

In the spring of the year (1979), two local lobstermen have gone gillnetting in areas within 10 miles of the island. These fish are sold at the Stonington Cooperative.

CASTINE AND BROOKSVILLE

Physical Setting and Population

Castine and Brooksville are small towns on the eastern shore of Penobscot Bay. Both towns are on the same peninsula as Blue Hill and Brooklin. Castine has 1080 permanent residents (1970 census), most of whom live in the nucleated section of town on the north shore of the Bagaduce River. The population of Brooksville was 673 in 1970. Most of the houses in this township are scattered along the roads of the township--not in any one or two hamlets.

Major Industries and Economic Pursuits

The Maine Maritime Academy is located in Castine, and the Academy's buildings, large training ship, and 600 students dominate the township. The Maritime Academy is clearly the major employer. There are no industrial plants in Castine. The town does have a very large retirement colony, who occupy a large proportion of the old colonial houses lining the streets of the town. The existence of this retirement colony and the large number of seasonally occupied houses in the area produces service jobs for carpenters, maintenance people, etc.

Brooksville also has no single major employer. Its scattered population is composed of people working in the construction trades, fishing, or who are retirees.

General Infrastructure

Castine may be reached by Route 166. The town has a small hospital with a small medical staff. It also has several small food stores, etc. However, most of the people in town do much of their shopping and obtain many services in Bucksport or Bangor. The only large installation of any kind is the Maritime Academy.

Castine is a very old town, and many of the older houses have been well preserved. In many respects the town is a museum of 19th century America.

Brooksville is very rural and has only two small stores and a couple of other commercial establishments. Most local people shop and obtain services in Bucksport, Blue Hill, or Bangor. Most of the houses in the township were once old farms; many have been remodelled, either by local people or "out of staters." As in many towns in the area, many of the newcomers and summer people are relatively wealthy, as is testified by the number of yachts in the harbor.

Port Infrastructure

The harbor at Castine is in the mouth of the Bagaduce River. Most of the boats are moored very close to the center of Castine. Many of the smaller Maritime Academy boats are moored about 1/2 mile away, on the Brooksville side of the river. There are four notable establishments along the Castine waterfront. First, the "State of Maine," the Maritime Academy's training ship is tied up to a dock near the center of town about nine months a year. (The other three months it is on a cruise.) Near the Academy dock is the large town wharf, which has a good-sized parking lot and a large float. This pier is the one used by most commercial fishermen. A short distance away is Eaton's Boatyard which repairs boats and has fuel. About 1/4 mile down the harbor is the Castine Yacht Club with a new clubhouse and moorings for yachts, etc. Eaton's buys some lobster, but there is no full-fledged lobster buyer in town.

There are two sets of harbors in Brooksville: Buck's Harbor and nearby Orcutt's Harbor on Eggemoggin Reach. Buck's Harbor, the major harbor, is very well-protected due to the fact that there is a small island in the harbor mouth. There is no dock for commercial fishermen, nor any dealer. There is, however, a Yacht Club Wharf and a small marina, called "Kips Wharf" where boats can buy gas, oil, and a few other stores. The harbor is dominated by recreational boats. At Buck's Harbor, there were 28 yachts moored and only 4 lobster boats. Orcutt's Harbor is used as a mooring for only a few boats.

The other set of harbors is at Cape Rosier, on Penobscot Bay. There are three harbors at Cape Rosier: Weir Cove, Horseshoe Cove, and Goose Cove. Weir Cove, the major anchorage, has about 5 boat moorings, and Goose Cove 2 moorings. Horseshoe Cove has only one or two moorings, although there is a boatyard operated by Robert Vaughn at the head of the cove.

Types of Fishing

Lobster

1. Number of Boats, People, and Fishing Areas

At Castine there are four large inboard-powered boats whose owners go lobstering for at least some time during the year. There are also another 12 skiff fishermen who operate from the harbor in the summer and early fall.

In Buck's Harbor (Brooksville) there are four inboard-powered lobster boats and another four to six skiff fishermen. Cape Rosier has another six lobster fishermen with inboard-powered boats and a few skiff fishermen.

2. Marketing

Eaton's boat yard buys a few lobsters from Castine fishermen. Since there is no dealer in either town, most of the local fishermen sell their catches to dealers on Deer Isle or to Jeff's Lobsters in Bucksport. A large number of lobsters caught by local fishermen are sold directly by fishermen to local consumers.

3. Processing

None.

Scallops

1. Number of Boats, People, and Fishing Areas

At Castine there are two wooden draggers about 40 feet long which do a good deal of scalloping in the winter. Another 48 foot dragger goes scalloping all year. In the winter this boat fishes in local waters around the mouth of Penobscot Bay; in the summer and fall, it goes to Cape Cod and fishes there.

At Castine, there are another six boats that go scalloping in the winter. Most of these are from other towns; however, two local lobster fishermen rig up for scalloping in the winter as well.

At Cape Rosier and Buck's Harbor, there are two lobster fishing boats that have gone scalloping in recent years.

2. Marketing

Scallops caught from Castine are sold to one local retail market and to Jeff's Lobsters in Bucksport. Buck's Harbor fishermen tend to sell their scallops at Stonington.

3. Processing

None.

Minor Fisheries

One Castine boat (40 feet) does a good deal of groundfishing in the summer and fall. (It scallops in the winters.) Moreover, there are approximately 12 men from Castine and Brooksville who earn most of their income clamming and another 20 to 25 men who go clamming part-time. These clams are sold either to Jeff's Lobsters in Bucksport or to Black's shucking house in Brooksville. Black's employs about six to eight women and girls to shuck clams.

BUCKSPORT AND VERONA ISLAND

Physical Setting and Population

Verona Island is located in the Penobscot River. It stretches from the place where the river meets Penobscot Bay inland for six miles. The town of Bucksport is on the east bank of the Penobscot River, at the point where the river divides and forms two channels which flow on either side of Verona Island. Bucksport is thus about six miles from Penobscot Bay and some 17 miles from the cities of Bangor and Brewer to the north. In 1970, Bucksport had a population of 3756, and some 470 of those people lived at scattered locations on Verona Island, also a part of Bucksport. Very little fishing is done in the area. The major maritime activity is unloading ocean-going tankers carrying oil and liquid sulfur.

Major Industries and Economic Pursuits

Bucksport is dominated by the St. Regis Paper Company mill which employs approximately 1100 workers in the production of lightweight coated paper. A very high percentage of people in Bucksport work at the paper mill, but many commute to the Bangor area to work. A few people are employed by the C. S. Sprague Company, the Freeport Sulfur Company and Webber Oil Company which unload the tankers and operate a small tank farm. The only tourist facility of note is the Jed Prouty tavern on the main street of town. Only a dozen people are employed in fishing, and most of them have other jobs.

General Infrastructure

U. S. Highway 1 passes through Bucksport, and the town is also served by State Highway 15 connecting it with Bangor. A spur line of the Maine Central Railroad serves the St. Regis paper company and other installations near the Bucksport waterfront. Bucksport has a small shopping district with some eight or nine small stores. Most people in the area do their shopping and obtain most services in Bangor. There are no commercial establishments of note on Verona Island.

Port Infrastructure

All of the boats in the Bucksport-Verona Island vicinity anchor in the Penobscot River. There are about six moorings off the Bucksport town wharf, near the center of town. This is the largest concentration of boats in the area. Another three or four small boats are anchored at scattered locations along the shoreline.

There are two large piers at Bucksport where tankers unload cargo. One is owned by the C. H. Sprague Company and juts out into the Penobscot River near the downtown section and the paper mill. This pier is used to unload oil. The Freeport Sulfur Company pier is located on the river a little north of town.

The large ocean-going vessels coming to Bucksport ordinarily wait for favorable tide conditions below Verona Island in Penobscot Bay, and then come to Bucksport with the aid of tug boats from Belfast.

There is a small U. S. Coast Guard office in Bucksport, but no Coast Guard boats are stationed in town.

Types of Fishing

Only lobstering, crabbing, and scalloping are done by boats from Bucksport, and total landings from these boats are relatively small.

Lobster and Crabs

1. Number of Boats, People, and Fishing Areas

There are approximately 12 lobster fishermen in the area. About six operate out of Bucksport itself; the other six keep their boats at different locations around Verona Island. Two of these men fish for crabs primarily, although they inevitably catch some lobsters too. Virtually all of these fishermen have other jobs and fish only from April to October. In the summer, about 25 men and boys fish for lobsters and crabs from small skiffs.

2. Marketing

Most of the fishermen in the area sell their catches locally--primarily to Jeff's Lobsters, located on Verona Island.

3. Processing

Jeff's Lobsters cooks and picks a good many lobsters to sell as lobster meat. The wives of the two fishermen who concentrate on crab fishing pick crabmeat and sell it packaged to Jeff's Lobsters, to restaurants or in private sales. At present, there is very little scalloping in upper Penobscot Bay.

Minor Fisheries

Two of the local fishermen in the past several years have gone scalloping in the upper reaches of Penobscot Bay during the winter, and have switched to lobstering in the warm months of the year. The scallops they catch are sold to Jeff's Lobsters.

Important Institutions Related to Fishing

Jeff's Lobsters

This firm retails and wholesales all kinds of seafood from its store on Verona Island. The company has a small, garage-sized structure which houses its lobster tanks, retail display cases and fish cooler and freezer. The company own two trucks, which are used to deliver seafood to restaurants, etc. The firm has six employees.

Jeff's Lobsters regularly buys lobsters from six "big fishermen" and several "part-timers." In addition, fish are obtained from Stonington, Thomaston, and sometimes in Boston. Most of the fin fish are obtained from firms in Rockland, Thomaston, and Nova Scotia. Periodically, fish is purchased in Boston and Gloucester as well. Most of the clams are obtained from a dealer in Steuben.

The company sells some fish and lobsters in its small retail operation. Most are sold wholesale. Lobsters are air freighted out of the Bangor International Airport and are sold all over the United States. The firm regularly supplies restaurants in Lewiston and Bangor. At times, the firm will sell fish as far away as Gloucester, Boston and New York.

SEARSPORT

Physical Setting and Population

The town of Searsport is located about nine miles north of Belfast at the point where Penobscot Bay meets the Penobscot River. In 1970, the town had 1951 people. Searsport is one of the most important cargo ports on the Maine coast and is visited by dozens of ocean-going freighters and tankers each year. Searsport itself is a picturesque little village extending along U. S. 1. The docks and unloading facilities are located one mile east at Mack Point.

Major Industries and Economic Pursuits

A large part of Searsport's work force is employed at the docks. Both Shell Oil Company and Irving Oil Company maintain tank farms in Searsport along with the C. H. Sprague Company, which not only handles oil, but gypsum and salt as well. The U. S. Government also unloads oil to supply Loring Air Force Base in the northern part of the state. In addition, the Bangor and Aroostook Railroad maintains a set of tracks and a large pier in Searsport, and Merrill Transportation Company tank truck terminal is located close to the tank farms. The companies which maintain unloading facilities in Searsport, the railroad, and the trucking firm probably employ about 100 people total. More people are employed on a temporary basis when ships arrive to be unloaded.

The single largest employer in the Searsport area is the Delta Chemical Company which has a plant along U. S. 1 near the Stockton Springs town line. This highly automated plant employs some 73 people manufacturing ammonium sulfate, sulfuric acid and liquid alum for the paper companies of Maine and for food processing industries. The company receives its raw materials by barge from Australia, Jamaica, etc.

An indeterminate number of people are employed in the motels, shops and restaurants that line U. S. 1 in Searsport.

General Infrastructure

Searsport is served by U. S. 1; the Bangor and Aroostook Railroad maintains a spur line into the community; and of course, Searsport is accessible by water as well. The community has many fine old houses, which were built by retired sea captains, a Marine Museum, and a small business district which is housed in red brick buildings built in the last century. It does not have a full range of stores or a shopping center, or many professional offices. Many people from Searsport make a habit of going to Bangor on a regular basis to shop and obtain other services.

Port Infrastructure

There are two large piers in Searsport. One is a 610 foot pier owned by the C.H. Sprague Company and equipped with dump cars and unloading towers and conveyors which take dry cargo to storage areas. The Bangor and Aroostook railroad maintains the 750 foot I.T.O. pier which is used by Shell Oil Company, Irving Oil Company and the U. S. Government. The pier can accommodate about 30 railroad cars, and is equipped with a lot of other equipment for unloading both dry and wet cargos.

The Delta Chemical Company has a small dock near its plant in Stockton Springs harbor. The plant has an offshore pipeline which runs from an offshore mooring platform near Sears Island (1/2 mile away) to a series of storage tanks on shore.

Near the central part of Searsport, the town maintains a rock filled dock, capable of carrying small trucks. Nearby there is also a parking lot and a small launching ramp. This is the pier used by the fishermen in the area, and their moorings are within a few hundred yards of this dock.

Types of Fishing

Lobstering and clamming are the only kinds of fishing activities carried out in the area.

Lobster

1. Number of Boats, People, and Fishing Areas

There are no full-time lobstermen operating out of Searsport. Five men own inboard-powered boats or large skiffs and earn much of their income from lobster fishing during the warm months of the year (May to October). Most of these men have other jobs in the winter.

2. Marketing

Lobsters caught by local fishermen are sold to Superior Shellfish Company in Searsport, or to local restaurants.

3. Processing

None.

Clams

1. Number of People

There are about 20 part-time clammers operating in the Searsport and Stockton Springs area.

2. Marketing

Virtually all clams are sold to Superior Shellfish Company since these clams are dug in polluted waters and this company is the only one with a depuration plant in the area.

3. Processing

Superior Shellfish Corporation shucks and packs large quantities of clams for shipment out of state. However, most of the clams dug in the area are sold as shellstock.

Important Institutions Related to Fishing

Superior Shellfish Company

This company is housed in a large metal building on Mack Point near the railroad tracks, tank farms and salt piles. The company operates a unique combination of different kinds of businesses. There is a retail fish market, a restaurant serving lobsters, clams, etc., a "Nautical Gift Shop," a clam depuration plant, and a clam shucking operation. The gift shop and restaurant operate only during the summer months; the other operations are open from April to December. In the middle of the summer, the company employs about 20 people. The restaurant and the shucking operation employ most of them.

The fish sold in the retail store come from as far away as Digby, Nova Scotia and New Bedford. Most of these fish are shipped to the company, although the company's trucks will go after them should need arise. The lobsters and clams are obtained both from five local fishermen and clambers and from dealers from Spruce Head to Jonesport.

The company owns two trucks which it uses to supply fish and shellfish to restaurants in Bangor, Rockland, Waterville, etc. They also ship lobsters and clams out of state, but these are shipped on trucks operated by interstate shipping companies.

The clam depuration operation consists of 10 fiberglass tanks, capable of holding 140 bushels of clams. A constant flow of sterilized water is pumped through the tanks. The clams are considered clean in 48 hours.

BELFAST

Physical Setting and Population

Belfast is a small industrial city about 35 miles southwest of Bangor. The city is located at the mouth of the Passagassawakeag River at the point where the river enters the headwaters of Penobscot Bay. In 1970, Belfast had a population of 5957 people. Unlike Camden, Rockport, and other towns on the lower part of Penobscot Bay, which are picturesque tourist towns, Belfast is dominated by the food processing industries. Only a few commercial fishing boats are moored in Belfast Harbor, but there are three fish packing operations in the community.

Major Industries and Economic Pursuits

The largest plants in Belfast are those owned by the Penobscot Poultry Company and the Maplewood Poultry Company. Each of these plants employs about 375 people to pack chickens, which are grown on farms within a 50 mile radius of Belfast. The grain to feed these millions of chickens arrives on the Belfast and Moosehead Railroad, and is mixed with fish meal to form a "high protein ration." Much of the fish meal produced by plants in Rockland and South Portland is purchased by these two chicken producing firms. There are two large shoe manufacturing firms in Belfast: Waldo Shoe Company and Truett Brothers. Together, they employ about 500 people. In addition, the Mathews Products Company employs about 60 people manufacturing doors and windows, and the Belfast Manufacturing Company has about 50 to 55 people who make ski pants and other types of sportswear. Other large employers in the area are the Stinson Canning Company, which packs sardines, and the Penobscot Freezing Company (90 to 100 employees), which produces frozen squash and baked stuffed potatoes under the "Penobscot" brand. Many people from the Belfast area are employed in the motels, restaurants and shops which line U. S. 1 a few miles north in East Belfast and Searsport.

General Infrastructure

Highway U. S. 1 runs along the outskirts of the city of Belfast. Belfast also has a downtown shopping district with a complete range of stores, and two shopping centers, one on U. S. 1, just outside of town, the other in town. However, some people from Belfast obtain professional services and shop in Bangor, about 35 miles away.

While Belfast has several thriving plants, it is not an imposing city. The "downtown" shopping section is housed in a set of brick buildings which were built in the late 1800's. Along the waterfront are the packing plants, a grain mill and a couple of large empty lots filled with debris from buildings that once stood there. Away from the waterfront are several beautiful tree-lined streets with large houses built before World War I, but even they cannot mask the fact that Belfast is an industrial community--not a tourist attraction.

Port Infrastructure

The mouth of the river affords a protected anchorage for boats operating out of Belfast. Belfast's waterfront is dominated by the docks and wharfs of several industrial concerns, such as the Stinson Canning Company. The city of Belfast maintains a landing and launch ramp for small boats. There is also a privately owned marina ("City Boat Landing Marina") with a marine railway and dry storage facilities. The Penobscot Bay Towing Company moors its six large tug boats at Marshall's wharf, near the center of town. These tug boats are used to aid large tankers and freighters going up the Penobscot to Searsport, Bucksport, Winterport, and Bangor. Central Maine Power Company moors a research vessel at Belfast. The Department of Marine Resources uses Belfast as a home port for two extension vessels, which do gear evaluation and resource assessment studies in upper Penobscot Bay.

Types of Fishing

Lobster and Crabs

1. Number of Boats, People, and Fishing Areas

There are only five full-time lobster fishermen in Belfast, and three of these men reportedly had other jobs. In the summer an estimated 20 people fish for lobsters on a part-time basis out of skiffs.

2. Marketing

Three of the full-time fishermen and most of the part-time fishermen sell their lobsters and crabs to Young's Lobster Pound in East Belfast, or to City Boat Landing.

3. Processing

City Boat Landing sells live lobsters and lobster tails, lobster meat and cracked crab claws. In addition, the owner of one of the local restaurants is planning to open a crab processing plant in a small building on the Belfast waterfront in the summer of 1979.

Minor Fisheries

In the past few years, two or three of the larger local lobster boats have gone scalloping in the upper reaches of Penobscot Bay. Only one has gone after scallops in 1978 and 1979. About 10 men do clamming on a part-time basis.

Important Institutions Related to Fishing

Stinson Canning Company Plant

The Stinson plant is located on the waterfront at the upper end of the harbor near the large U. S. 1 bridge. The plant is a one story brick structure built in 1902. The Stinson Company purchased the plant in 1958 and currently uses it to can sardines and fish steaks in 3 3/4 oz. cans. (In the past, the plant used to pack shrimp, but the two shrimp machines have not been run for five years.) At the height of the herring season, the plant employs 165 to 170 workers. About 20 people are employed all year long.

If the fish are caught within 80 miles of the plant, they are brought in by herring carrier; if they are caught further away, they are transported to the plant by truck. This plant cooperates closely with the other Stinson Canning Company plants. If herring are caught in the Penobscot Bay area, all the fish might be brought to this Belfast plant, and dumped into trucks to go to other plants. When fish are in other areas, the Belfast plant receives fish by truck from them. All of the fish used are caught by the Stinson Company's own fleet of purse seiners or by other fishermen throughout Maine and the Maritimes who are obligated to give the Stinson Company first refusal on their fish.

Many of the canned sardines from this plant are shipped to California. A lot are also shipped to the South where they have been sold for the past 50 years under the company's "Possum" brand.

Young's Lobster Pound

This seafood business is located on a wharf jutting out into Belfast harbor from the East Belfast side. Young's sells lobsters, clams, crabmeat, and sometimes haddock both wholesale and retail. In the summer, it operates a small restaurant specializing in steamed lobsters and clams. The restaurant, lobster holding tanks, and retail operations are housed in one building on the wharf.

All the seafood is bought from other dealers in the central coast area, save for a few lobsters and crabs which are bought from three full-time lobstermen who bring their catch directly to

Young's (Young's does not supply these fishermen with gas or bait, however.)

Young's Lobster Pound has tanks for 35,000 lobsters, but no pound. The company ships lobsters via air freight out of the Bangor International Airport, and also uses its own truck to supply restaurants on the coast and in the Waterville area.

City Boat Landing

This company is a large buyer and seller of lobsters, which it purchases throughout Maine and Nova Scotia. The company supplies lobsters to restaurants and seafood dealers in about 25 southern and western states, primarily Florida, Louisiana and Texas. In addition to shipping live lobsters, the company processes lobster and crabs and distributes lobster tails, lobster meat and cracked crab claws. It employs approximately 15 people.



LINCOLNVILLE BEACH

Physical Setting and Population

Lincolnville Beach is a very small hamlet on the western shore of Penobscot Bay about 8 miles north of Camden. The hamlet literally consists of a few houses and 3 restaurants strung along a half mile section of U. S. 1 which runs very close to the shore at this point. The most noteworthy feature of the community is that it is located on one of the very few sand beaches in the central part of the Maine coast. Lincolnville Beach is in the township of Lincolnville which had a population of 955 according to the 1970 census. Besides Lincolnville Beach, there are two other hamlets in the township, Lincolnville Center and Heals Corner, located in the interior of the township, some 6 or 8 miles from Penobscot Bay itself.

Major Industries and Economic Pursuits

The town of Lincolnville is very rural and has little industry of any kind. Most of the people in the township work either in Camden or Belfast, or are retired. There are a small number of dairy farms and chicken farms scattered throughout the township, a boat shop located on Penobscot Bay, and two or three small lumber mills. Tourism is probably the most important industry in the town. Not only are there three restaurants at Lincolnville Beach itself, but there are several motels, antique stores, and gas stations scattered along U. S. 1.

General Infrastructure

U. S. 1 is the only highway of note running through Lincolnville. There are a couple of other tarred roads serving the interior part of the town, but they are of secondary importance. The State of Maine operates a car ferry between Lincolnville Beach and Isleboro.

There are very few commercial establishments of any kind in the whole township of Lincolnville, and nothing that resembles a shopping center, or downtown area. Most of the people from Lincolnville shop and obtain services in Camden or Belfast.

Port Infrastructure

The only structure of note along the waterfront area of Lincolnville Beach is the large State Ferry Wharf. Along one side of this wharf is a float which serves as the town dock. The strip of land between the beach and U. S. 1, near the center of Lincolnville Beach is a state park. The park is open during the summer months and has facilities for swimming and picnicking.

There is no protected anchorage at Lincolnville Beach. Most of the boats are moored north of the State Ferry Wharf where they find some protection. The entire anchorage, however, is exposed to winds from the north and east.

Types of Fishing

Lobster

1. Number of Boats, People, and Fishing Areas

There are six inboard-powered lobster boats which operate from Lincolnville Beach. The men who own these boats go fishing between six to nine months of the year. None of these men do any fishing in the winter months since there are very few lobsters in this part of the Bay during this season. As a result, all of these men have other jobs in the winter months and some of them have other jobs throughout the year. In addition, there are eight men and boys who go lobstering on a part-time basis in the summer months in small outboard powered skiffs.

2. Marketing

There is no lobster dealer in Lincolnville Beach. Some of the lobsters are bought by one of the local restaurants, which is equipped with storage tanks, but the vast majority are sold to Jordan's Market in Rockland or City Boat Landing in Belfast.

3. Processing

No lobsters are processed in Lincolnville Beach.

Minor Fisheries

One boat, about 40 feet long, alternates between groundfish dragging and scalloping in the upper reaches of Penobscot Bay. This fish is sold in Rockland. There are no clammers, wormers, or herring fishermen in Lincolnville Beach.



ISLESBORO

Physical Setting and Population

Islesboro is a long, narrow island (14 miles long) in the middle of Penobscot Bay. West of the island is West Penobscot Bay, about three miles wide; to the east is East Penobscot Bay, which is also some two to four miles wide. The island has a very large wealthy summer colony. In the winter the population is about 480 (1970); in the summer it expands to about 2500 people. The houses (summer and permanent) are located all over the island, but predominantly around Dark Harbor and Gilkey's Harbor. The northern section of the island is relatively sparsely populated. A ferry connects Islesboro with Lincolnville Beach.

Major Industries and Economic Pursuits

The major industry on Islesboro is maintaining and caring for the estates of wealthy "summer people." There are at least 50 or 60 people who are either "caretakers" or else employed as carpenters, plumbers, and workers on "cottages" much of the time. The Dark Harbor Boatyard on nearby 700 Acre Island, employs a few islanders. Many islanders commute to the mainland every day to find work in Rockland, Camden, or Belfast. Only a few islanders go fishing, and most of them are "part-timers." The Islesboro Inn and two small restaurants are the only businesses catering to transient tourists. Both are closed from September to June.

General Infrastructure

Islesboro can be reached by the state-operated auto ferry which runs between Lincolnville Beach and Grindle Point on Islesboro. The ferry, which can hold about 15 cars, makes the round trip to the mainland about six times daily in the summer and five times in the winter. There are about 25 miles of paved road on the island, maintained by the state. A series of small private roads run from the main highway to the forty-odd estates on the shore. A small publically owned airport is open for use by private planes in the summer months. There are two stores on the island. The Pendleton and Coffin Store carries a large assortment of merchandise and also operates a freight service from the mainland. Leach's Express also hauls freight. While the island has no clinic there is a physician sponsored, in part, by town funds. Nevertheless, islanders still do a good deal of their shopping in Rockland, Camden and even Bangor. They obtain most of their services in these three cities as well.

Port Infrastructure

All of the important marine facilities are located around Gilkey's Harbor, near the southern end of Islesboro. On Grindle Point, at one end of Gilkey's Harbor, is the State Ferry Service terminal and dock, and a large town-owned dock and launch ramp. Nearby is Warren Island, a small island which was given to the State of Maine to be used as a State park. The State park has a dock and shelters for campers. On the Dark Harbor side of Gilkey's Harbor is the Islesboro Inn, with its guest moorings and floats, and the Tarratine Yacht Club, which has a large and very active membership. On 700 Acre Island is the Dark Harbor Boat Yard, which repairs and stores yachts, and provides fuel, water, ice and marine supplies. Gilkey's Harbor is a very large, well-protected harbor, about two and a half miles long with 250 mooring spaces. In the summer months, it is a common occurrence to have over 100 yachts anchored in the harbor at night.

Types of Fishing

Islesboro is not a large fishing community. There are a few lobster fishermen on the island, a few clambers, and one dragger.

Lobster

1. Number of Boats, People, and Fishing Areas

There are some eight lobster fishing boats on Islesboro. Four are small, inboard-powered boats under 30 feet in length; the other four are skiffs. Several of these lobstermen make fishing a full-time occupation in the summer months. However, none of these men go fishing in the winter, and most of them find some other jobs (e.g. working in boat yards, etc.)

2. Marketing

In the summer, most of the lobsters caught by Islesboro fishermen are sold to "summer people" who live on the island. In the spring and fall, most fishermen sell their catches to City Boat Landing in Belfast.

3. Processing

None.

Clams

1. Number of People

The town of Islesboro sells about 15 clam digging licenses a year for \$100.00 each. Two or three of these licenses are bought by Islesboro men; the rest are purchased by people from other towns--especially from Waldoboro. Some of these clambers have small, outboard-powered skiffs which they use to go back and forth to the mainland. Others have no boat at all.

2. Marketing

In the summer, many of the local clams are sold locally. Many of the off-island diggers sell to dealers in their home areas (e.g. Waldoboro).

3. Processing

None.

Minor Fisheries

One 40 foot wooden boat, owned by a family on 700 Acre Island, is regularly used for scalloping in the winter, and groundfish dragging in the spring and summer. This boat operates, in the main, within the confines of the upper part of Penobscot Bay. In past winters, this boat and one lobster boat have been rigged for scalloping.

CAMDEN

Physical Setting and Population

The town of Camden is located on the west shore of Penobscot Bay about six miles north of Rockland harbor. In the past, Camden was a mill town. It is now almost completely devoted to the tourist trade. With the exception of Boothbay Harbor, more tourists visit Camden than any other place on the Maine coast. In the winter, the population is about 4700; in the summer it is an estimated 10,000 if all the people who live in cottages and motels are included. Little fishing takes place out of Camden harbor.

Most of the tourist activity takes place around Camden harbor which is ringed with hotels, marinas catering to yachtsmen, wharfs handling passengers from excursion boats and the tourist schooner fleet, etc. On the back streets, away from the water, there are still several mills, but they are scarcely noticed by the tourist population.

Major Industries and Economic Pursuits

Tourism provides a great many jobs for people in the Camden area. The town has some 16 motels, mostly located along U.S. 1, and boasts eight large restaurants. There are also a score of antique and gift shops, two good book shops, and stores specializing in furniture, stained glass, cheese and wine, etc. There are three good-sized mills in Camden. The Knox Woolen Mill, located in a 120 year old building near the downtown section of Camden, employs about 170 people in making cloth mats and filters for Maine's paper mills. The Camden Tannery occupies an old textile mill on the outskirts of town and employs about 80 people making fine leathers and sheepskins. Tibbetts Industries occupies a one story brick structure on the southern edge of Camden, and manufactures speakers and microphones for hearing aids, phone circuits, etc. The plant employs about 150 people.

General Infrastructure

Highway U. S. 1 goes through Camden and serves as the main street of town. The closest large airport is at Bangor; the nearest rail spur at Rockland. Camden, however, serves as a shopping center and service center for a large number of tourists and also local people from small towns in the hinterlands. It has a very large number of stores, and a shopping center. It also has a larger number of professional people than one would expect in a town this size.

Port Infrastructure

The primary activity in Camden harbor is recreational boating. In the summer, there are over 200 yachts moored in the harbor. Many of the owners of these boats belong to the Camden Yacht Club, which has a wharf near the entrance of the harbor. On the south side of the harbor there are two marinas: Lok Marina, and Harborside West. The northern side of the harbor is dominated by the Wayfarer Marine Corporation which repairs and stores yachts. The company also operates an excellent marine store. The most unusual feature of Camden harbor are the seven Windjammer Schooners. These two masted sailboats range in length from 70 to about 100 feet and take out tourists for week-long cruises on Penobscot Bay and the area between Boothbay Harbor and Northeast Harbor. Most of the boats in this fleet operate out of Windjammer wharf or the town landing.

Types of Fishing

Little fishing is done in Camden. There are a few lobstermen and one herring boat. No draggers operate out of Camden, although two Camden men own draggers which they moor in Rockland.

Lobster

1. Number of Boats, People, and Fishing Areas

There are six inboard-powered lobster boats operating out of Camden. Most of the owners of these boats have other jobs. In the winter none of these men fish for lobsters, since there are few to be caught in the upper reaches of Penobscot Bay at this time of year. In the summer, there are approximately 18 part-time skiff fishermen operating from Camden.

2. Marketing

No lobster dealer operates a wharf in Camden. Homeport Lobster and Crab Company, a relatively small operation, buys some of the lobsters and crabs caught by Camden fishermen. More of them are sold to Ayre's market, on the main street of town, which specializes in retailing all kinds of fish.

3. Processing

No lobsters are processed in Camden. Several local women, however, pick a good many crabs in the summer months for sale in local stores, etc.

Herring

1. Number of Boats, People, and Fishing Areas

In the recent past, Camden was the home port for several large seiners. At present only one stop seiner considers Camden as its home port. The owner of this operation has a 42 foot boat equipped with a mauler, and an older 80 foot wooden boat which serves as carrier for the herring caught. During the herring season, this operator does stop seining all over the central part of Maine. He does not restrict his operations to Penobscot Bay alone. There are about four employees at this time, who come from the immediate area.

2. Marketing

The herring from this operation are sold to plants in Rockland or Stonington.

3. Processing

No processing of herring is done in Camden.

Important Institutions Related to Fishing

International Marine Publishing Company

This company, which has offices in Camden, published many books related to fishing, boat building, and the maritime trades. A subsidiary company publishes the National Fisherman, one of the most important trade papers of the fishing industry in the United States.

ROCKPORT

Physical Setting and Population

Rockport is a town of 2067 people (1970 Census) about four miles north of Rockland on the west side of Penobscot Bay. It is a very wealthy community which has been maintained as a picturesque old New England town. There are several large estates in town, and the harbor is filled with yachts during the summer months. Very little fishing is done from Rockport harbor.

Major Industries and Economic Pursuits

There are no industrial plants in Rockport. Some of the local people find employment in the stores, restaurants, galleries and gift shop located in the block long "downtown" section, or along Route 1. Another 14 men go fishing from Rockport, and an equal number find employment in the two boatyards during the tourist season. Far more Rockport residents work in nearby Rockland or Camden. However, informants said that a great number of Rockport residents were either retired or were wealthy enough that they really did not have to work. Rockport is not a summer colony or a tourist town. There are few accommodations for tourists, and the houses are generally occupied year-round.

General Infrastructure

U. S. Highway 1 runs through the outskirts of Rockport. The town, however, is not served by any other form of transportation.

There are a few stores, gift shops, etc. in town, which are clearly oriented toward the tourist trade in the summer. There is, however, no shopping complex, supermarket, or professional office building. Local people usually shop for food, clothing, etc. in Rockland or Camden. Rockport is the home of the Penbay Medical Center, which serves the entire region and has a staff of 52 physicians. It also has a small photography school.

Port Infrastructure

Rockport has an excellent deep water harbor, which is well-protected. There are approximately 90 moorings in the inner harbor, virtually all of which are occupied by yachts and pleasure boats in the summer. At the head of the harbor is the Rockport Marina and Sail Loft Restaurant, which operates: a restaurant, a marina supplying gas, ice, etc. to yachts, and a boat yard which repairs and stores yachts. Nearby there is also a town public landing with a launch ramp, and "Marine Park," which has a float used for landing passengers from tourist boats. On the west side of the harbor is "Atlantic Campgrounds," a privately owned recreational camping area. There are no fish dealers in Rockport, and fishermen are not encouraged to use any of the publically or privately owned wharfs in the area.

Types of Fishing

There are a few lobster fishermen operating out of Rockport harbor, and there is also one stop seine operation. In the recent past, two draggers operated out of Rockport, but none do now.

Lobster

1. Number of Boats, People, and Fishing Areas

In 1978-79, there were 12 lobster fishermen operating from Rockport harbor. Several of these men, however, had other jobs, and very few fished throughout the year. In the summer months, there are an additional 20 men and boys who fish for lobsters out of outboard-powered skiffs. In the Rockport area, there are so many crabs that some fishermen make a major portion of their income from selling them.

2. Marketing

Most of the fishermen sell their lobsters locally--primarily to Graffam Brothers, a lobster wholesale operation. These men must obtain their gas, bait, etc. elsewhere since Graffam Brothers does not operate a lobster dealership in the usual sense. Other men sell to the Sail Loft restaurant directly, or take their lobsters and crabs into Camden or Rockland.

3. Processing

No lobsters are processed in Rockport. A couple of the lobster fishermen's wives, however, make a business of picking and selling crabmeat during the summer.

Herring

1. Number of Boats, People, and Fishing Areas

One local lobster fishermen and two local men who earn most of their income ashore are in partnership in a stop seine operation. They have the "rights" to close off Rockport harbor.

2. Marketing

North Lubec Canning Company has first refusal on the fish caught in this stop seine operation.

3. Processing

No processing of herring takes place any closer to Rockport than Rockland.

Important Institutions Related to Fishing

Graffam Brothers

This company specializes in supplying lobsters for the wholesale market all over the United States. It operates from a modern, one story building near the head of Rockport Harbor, which contains the company's office and tanks capable of holding 30,000 lbs. of lobster. There are seven employees.

Graffam Brothers buys its lobsters from dealers in Nova Scotia, and in the central and eastern parts of Maine. The company also buys directly from six to eight local Rockport lobstermen. It does not operate a lobster dealership, so that these fishermen must get their own bait and gas elsewhere.

The company does not have a pound, and does not hold lobsters in its tanks any longer than absolutely necessary. A very high percentage of the lobsters are packed in styrofoam-lined boxes filled with ice, trucked to Boston in the company's own truck, and air freighted all over the United States and to western Europe.

ROCKLAND

Physical Setting and Population

Rockland is located on the west shore of Penobscot Bay about 80 miles northeast of Portland. In 1970, the population of the city was 8505. Rockland's importance is far greater than population figures alone suggest. It is the fifth largest port in New England. It is the county seat of Knox County. It is also the largest city in this part of the state of Maine, so that its stores, restaurants, hospital, and professional offices serve people of the entire Knox County region and beyond. Rockland is dominated by the sea. Although there are relatively few fishing boats operating out of Rockland, the city is home to dozens of firms which process fish or serve the maritime industry. In some respects, the city is more a processing and marine manufacturing center than it is a fishing port.

Major Industries and Economic Pursuits

Manufacturing plants are the largest employers in Rockland. The largest plants are as follows: (1) Marine Colloids (sea moss products), (2) Van Baalen Corp (clothing), (3) Fisher Engineering (snowplows), (4) National Sea Products (frozen fish products), and (4) Martin Marietta Corporation, which produces cement in its plant across the city line in Thomaston. These plants each employ over 200 people. Another important plant is owned by the Bicknell Manufacturing Company whose 40 employees are engaged primarily in the production of stone quarrying tools. There are also four sardine plants and a redfish plant, which employ approximately 850 people from Rockland and surrounding towns on a seasonal basis (primarily June to December). There are dozens of smaller firms which employ a total of several hundred people processing fish, repairing boats, manufacturing boat parts, fishing gear, business forms, etc. In addition, of course, there are a large number of Rockland men who work on boats themselves. While Rockland is not a mecca for tourists, the Samoset Resort Hotel is located on Jameson Point on the northern shore of Rockland Harbor. The Samoset has 150 rooms, a golf course, swimming pool, indoor tennis courts, and is perhaps the most luxurious resort hotel in Maine. The city is also the homeport for three boats of the schooner fleet which take tourists out for week-long cruises between Boothbay and Mt. Desert Island during July and August.

General Infrastructure

U. S. Highway 1 goes right through Rockland, and the city is served by a spur of the Maine Central Railroad. The city's downtown section is about four blocks long, and is lined with a wide variety of stores, banks, restaurants, and hotels. Most of these business establishments are housed in red brick buildings which were constructed in the late 1800's or early in the present century. The courthouse, library, and hospital are one block west of the main street, on Union Street. The city is also served by the Pen-Bay Medical Center, a new regional hospital, which is located on U. S. 1, in Rockport, several miles north of Rockland. The city also has a number of bars which cater to fishermen and plant workers. West of the commercial section of town are several neighborhoods with tree-lined streets and houses built in the early part of this century. As one moves further from the center of town, the houses generally become poorer, and there are several large trailer parks. There are very few one story ranch houses of the type that grace most of the suburbs of the United States.

Port Infrastructure

Rockland has a very large harbor. The outer harbor is protected by a stone breakwater about seven-tenths of a mile long, which extends from Jameson Point at the northern end of the harbor. Very few large, ocean-going vessels visit Rockland, however, since the inner harbor channel is only 18 feet deep and there are no very large docks where such vessels could be loaded or unloaded. The largest vessels that regularly visit Rockland are Coast Guard ships and large fishing boats, but these are well under 150 feet long. When large boats do visit Rockland, they must be accompanied by a pilot, since a pilot is mandatory for all such vessels entering or departing any port within Penobscot Bay.

Rockland has a Coast Guard Station where several USCG ships are regularly stationed. It is also a Customs port of entry, although the closest Customs office is in Belfast. Immigration officers, however, normally come from Portland on those few occasions when that is necessary. The Coast Guard, however, has a vessel documentation officer stationed in Rockland.

The Maine State Ferry Service operates a dock at the northern end of the harbor to serve the ferry boats operating between Rockland and the islands of North Haven and Vinalhaven. A smaller ferry boat, capable of taking only passengers, operated from the ferry dock in Rockland and served the island of Matinicus; however, this boat was condemned in 1977 and as of 1979 had not been replaced.

There are two general anchorages in Rockland harbor, with about 120 moorings. These moorings are allocated by the harbor master.

There are two publically-owned wharfs, and one boat launching ramp. In addition, there are 21 large piers or wharfs owned by companies and plants operating along the Rockland waterfront.

Types of Fishing

Rockland is involved in several important ways with every type of fishing and fish processing that is done in Maine. Men from Rockland go lobstering, and they operate boats further off shore for groundfish, scallops, and redfish. In addition, Rockland has three canning operations; a plant which fillets herring and groundfish; another which processes redfish; and still another which processes frozen fish blocks.

Lobster

1. Number of Boats, People, and Fishing Areas

There are 36 men from Rockland itself who are actively involved in lobstering. However, only six of them are full-time fishermen operating from Rockland itself. Another five men live in Rockland and keep their boats somewhere else. Most of these men are operating out of Spruce Head, Owl's Head or South Thomaston. Several have exclusive fishing rights in the waters around some of the islands in the Muscle Ridge Channel.

There are also 25 part-time fishermen who live in Rockland. The vast majority of these people fish in small skiffs near Rockland itself in the warm months of the year. Most of their income comes from the jobs they hold in Rockland's plants, or by working on large offshore draggers. Only two of these part-time fishermen live and work in Rockland, but do their fishing from another harbor.

Rockland is far enough up Penobscot Bay so that there are very few lobsters available in the winter months. During February and March of 1978, there were only three boats operating from Rockland Harbor itself.

2. Marketing

There are no lobster dealers or lobster fishermen's cooperatives in Rockland. All of the Rockland lobster fishermen sell their catches at Owl's Head or at Spruce Head or else sell directly to one of the seafood dealers in Rockland (e.g. Jordan's Seafood).

3. Processing

No lobsters are processed or canned in Rockland.

Groundfish

1. Number of Boats, People, and Fishing Areas

In 1978 several Rockland boats went dragging for groundfish. There were three older, eastern-rigged draggers, with three man crews, that fished primarily within fifty miles of the mouth of Penobscot Bay. Western Sea and Western Wave, two large steel boats owned by the Stinson Canning Company, dragged for cod, haddock, hake and flatfish during the spring of 1977 and 1978 when they were not pair trawling for herring. These two boats each have a crew of four. In addition, there are five large steel draggers (90 to 119 feet long), owned by F. J. O'Hara and Sons, Inc. which have crews of six to eleven men and fish all over the Gulf of Maine. The primary target fish of the O'Hara fleet is ocean perch, but all of these boats land substantial quantities of other groundfish as a by-product.

2. Marketing

Western Sea and Western Wave regularly land all their fish (herring and groundfish) at the Stinson Company plant on the south side of the Rockland waterfront, where the fish are filleted and packed. The O'Hara fleet boats and the other privately owned boats, land their catches at the F. J. O'Hara Company wharf. The ocean perch are generally processed at the O'Hara Company plant on the wharf; the groundfish are ordinarily trucked to the Boston market, and sold through a broker. Some are sold to Jordan's Seafood Market and other local dealers.

3. Processing

Haddock, cod, hake, pollock and flatfish caught by the Stinson Company boats, and by other boats under contract to the Stinson Company, land their fish at the Stinson plant where they are filleted and put out either as fresh or as frozen fish for the wholesale market. The ocean perch caught by the O'Hara fleet are processed at the O'Hara plant. The National Sea Products factory processes over 100,000 lbs. of frozen groundfish per day. Some of this fish is purchased from the Stinson plant, but most comes from Gloucester, Boston or Canada in the form of frozen fish blocks.

Herring

1. Number of Boats, People, and Fishing Areas

No Rockland fishermen own or operate weirs or stop seine operations. A few men, periodically, do work on stop seine operations owned by men from other towns such as Tenant's Harbor or Port Clyde. There are three Rockland boats, however, that spend a great proportion of their time fishing for herring: Western Sea and Western Wave, owned by the Stinson Canning Company, have been pair trawling for herring in Maine waters during the fall, and in Massachusetts in the winter. The Holmes Packing Company also owns a purse seiner, which normally fishes for herring only in the summer and fall near Penobscot Bay. The two Stinson boats carry a four man crew, the Holmes purse seiner a six man crew.

In addition, the three herring canning companies have six sardine carriers with two man crews which bring herring from boats and stop seine operations to the Rockland plants. Port Clyde Foods has "Nereid" and "Delca;" Holmes Packing Company owns the "Jacob Pike" and "Quick Step II;" while the North Lubec Company has "Pauline" and "Double Eagles." All these carriers are wooden vessels between 50 and 75 feet long, built in the 1930's and 1940's.

2. Marketing

All the company fishing boats bring their herring to the plant of the company that owns them. The captains and crews of these boats are paid a share of the catch. The sardine carriers do nothing but transport herring between the fishermen who sell to the companies and the company plants. The crews of these carriers are paid a fixed wage and a bonus which varies with the number of hogsheads of herring they transport and the herring scales sold. In short, all of the herring boats operating out of Rockland are owned by companies. The crews of those boats have nothing to say about marketing arrangements.

3. Processing

All of the herring coming into the North Lubec Packing Company plant, the Holmes plant and the Port Clyde plant are packed into cans. Most are sold in 3 3/4 ounce cans; a much smaller amount is packed in 15 ounce cans. All the herring landed at the Stinson Company plant are filleted, frozen, and packed into 20 kilo cardboard boxes for shipment to Europe or Japan.

Scallops

1. Number of Boats, People, and Fishing Areas

Three very large draggers fish for scallops out of Rockland. "Howie" (85 feet) and "Julie D" are owned by one Massachusetts firm; "Pocahontas" (91 feet) is owned by another. All of these boats carry 11 to 13 man crews and go trip fishing for 8 to 12 days at a stretch. All three boats drag primarily on Georges Bank and other offshore areas of the Gulf of Maine.

Most of the men in these three crews live in the Rockland area or in adjacent towns, although a few crewmen come from areas further away (i.e. Swans Island, Portland, Lewiston, etc.)

2. Marketing

The scallops produced by all three boats are taken out over the O'Hara Wharf and purchased by that firm. Ostensibly most of these scallops were being sold directly to Government agencies under contract in 1978.

3. Processing

The scallops caught by these three boats are shucked on board and then plate frozen or iced on board. They are then frozen and bulk packed at the O'Hara plant in Rockland.

Minor Fisheries

Approximately 15 people in Rockland supplement their incomes clamming.

Important Institutions Related to Fishing

Marine Colloids

Marine Colloids operates a very large, highly automated plant on Lime Street. It is the largest producer of carrageenan in the world. The carrageenan is produced from seaweed by two different types of chemical processes, and is used as a food additive, and also for cosmetics and in the production of medicines. In 1977, the firm produced approximately 3500 tons of powdered carrageenan from some 10,000 tons of seaweed. The plant consists of 18 buildings located on Crockett Point, which juts out into the middle of Rockland harbor. The firm currently has a total of 285 employees, of which some 65 are in technical and managerial positions. These employees are organized into three shifts and operate the plant 24 hours a day. There are 22 "mossers" in various parts of Maine, but they only gather and dry about 5% of the seaweed used by the plant. Most of the seaweed used is purchased in other parts of the world (Asia, Canada, South Africa, Europe, etc.). This seaweed is dried, baled, and shipped into Portland by boat, where it is loaded on trucks for shipment to Rockland. The carrageenan is shipped to market in trucks.

In 1976, Marine Colloids was purchased by FMC Corporation, a conglomerate with headquarters in Chicago.

National Sea Products, Inc.

National Sea Products, Inc. operates a very large plant on Tilson Avenue, and manufactures a variety of fish products from frozen fish blocks. The plant is the third largest processor of

fish in New England, and is owned by National Sea Food, LTD of Nova Scotia.

The plant employs some 190 employees, who operate four different production lines to produce over 100,000 lbs. of fish products per day. In all four operations, the frozen fish blocks are cut into usable portion-size pieces by band saw, and then put on a moving belt which runs through various vats and freezers where various operations are carried out. One line produces frozen, breaded fish fillets for both wholesale and retail markets. The second is an enormous line which produces fish wedges which are first dipped in a thick batter, then cooked in 600 degree oil and frozen on a belt that runs for six-tenths of a mile through a large freezer, and finally packed in boxes for the retail market. A third line produces batter-dipped frozen fish fillets which are not cooked in the factory. The fourth produces fish cakes which are cooked in the plant. In this line, fish remnants and fillets from the other lines which do not meet quality control standards are ground up with potatoes, shaped, and placed on a continuously moving belt, cooked in oil, and packed in three pound boxes.

Some of the frozen fish blocks are obtained locally from the Stinson plant, but the vast majority of the blocks are shipped into Boston from Canada or other foreign ports, and then trucked to Rockland, where they are processed. The products from this plant are sold in the U. S., although a certain portion are sold to foreign countries. The wide-ranging networks this company uses to obtain raw fish supplies and markets for final products is exemplified by the fact that we observed fish cakes being made from pollock from Alaska which will be sold in Australia.

In past years, National Sea Products maintained a fleet of seven large draggers to supply the plant with fish. In 1975, these ships were sold to buyers in Canada and the United States. Since that time virtually all supplies of fish have come from Nova Scotia factories via Boston. The firm, however, still operates its shipyard at the southern end of Rockland which it originally bought to maintain its fleet.

U. S. Coast Guard Station

The USCG has 92 men in the area--the vast majority of them being stationed permanently at the base at the end of Tilson Avenue near the F. J. O'Hara and Son plant and wharf.

Coast Guardsmen at the Rockland base operate and maintain all lighthouses and aids to navigation in the area, operate emergency lifeboats, and maintain a 24 hour radio watch. Two large Coast Guard vessels are stationed at Rockland: The "Snohomish," a 110 foot seagoing tug with a 21 man crew, and "White Lupine," a 133 foot buoy tender with a 22 man crew, which maintains buoys between Eastport, Maine and the Kennebec River. These boats also perform a vital function in the winter months when they are used for ice breaking to keep open the important harbors on Penobscot Bay and the Penobscot River. The base also has a 41 foot patrol boat, a 44 foot lifeboat, and a 65 foot tug, the latter with a five man crew. The crews of these boats live at the Rockland base and operate their boats only in the local area.

Coast Guardsmen attached to the Rockland base operate manned lighthouses at: Matinicus Rock, Browns Head (Vinalhaven), Heron Neck (Vinalhaven), White Head Light (Owls Head), Marshall Head Light (Port Clyde), Fort Point Light (Searsport), and Manan Island Lighthouse (next to Monhegan Island).

F. J. O'Hara and Sons, Inc.

This company operates a fleet of boats and packing plant on its wharf located at the foot of Tilson Avenue near the USCG station. The company operates five large steel draggers: the "Bradley O'Hara," "Massachusetts," the "Robert O'Hara," "Francis O'Hara," and "Robert Powell." These boats range in length between 88 and 114 feet, and travel the entire Gulf of Maine for redfish and groundfish. They carry crews of six to eleven men, who come from Rockland, the nearby towns, or from the islands in Penobscot Bay. These boats take trips between six and twelve days, and land all their fish at the O'Hara dock. A new boat, the "Araho" (119 feet) is being outfitted currently.

The boats owned by this firm fish for redfish and groundfish. The groundfish are shipped mainly

to Boston and New York markets. The redfish are processed in the O'Hara plant on the wharf. This plant employs 78 to 80 employees who work year round. The redfish are filleted by hand, packed into boxes, and frozen. Most of these fish are packed under the company's own "Cape Ann" and "Down East" brands. Some, however, are packaged for other suppliers, and bear their brand names. Most of the frozen redfish is transported from Rockland on refrigerator trucks and sold in the Midwest. The racks from the O'Hara plant are purchased by the Colson Company, which transports them in its fleet of trucks all over central Maine to lobster dealers and fisherman's cooperatives to be used as lobster bait.

The O'Hara dock is also used by six privately owned scallopers and draggers operating out of Rockland regularly. Some of these fish and scallops are purchased by the O'Hara Company and sold by them. The rest is put on trucks and sold to brokers, etc. in Boston and other markets. In this case, the owners of these boats pay O'Hara a fee for the use of his dock.

Marine Hydraulic Engineering Company

This company manufactures hydraulic lobster trap haulers, power steering systems for boats, and power blocks. It was started in 1964, and is currently moving into a new set of buildings in the Rockland Industrial Park. While this company is the largest manufacturer of hydraulic lobster pot haulers in the world, it employs only a few dozen people. Most of the parts it uses are manufactured by other companies, and then are assembled in the Rockland area. In the past, most of this company's products were purchased in Maine and other eastern states. At present, the company is expanding into international markets. It is currently making hydraulic haulers which can be run off outboard motors for use in Central America.

National Sea Products Shipyard

This is a very large shipyard located in the south end of Rockland's waterfront. The yard was purchased in 1957 by National Sea Products, primarily to service its own boats. At present, it repairs only boats of private owners, since National Sea Products no longer has fishing vessels in the Rockland area. The shipyard has two marine railways: one able to take vessels up to 220 feet long and about 1000 tons, the other, boats up to 170 feet. It employs about 30 men on a full-time basis, who scrape and paint vessels, man the machine shop, do engine work, and repair steel hulls. The shipyard does not build boats at present.

North Lubec Canning Company

North Lubec Canning Company owns a plant on Tilson Avenue, which does nothing but can sardines in four ounce cans. The plant was built about 1910, and employs standard technology found in all plants canning herring. Herring are brought to the plant from purse seine and stop seine operations by the carriers "Pauline" and "Double Eagle." The company owns no fishing boats of its own. The plant is ordinarily open from May to late November, and employs about 150 people. In the off-season, the plant has only six employees who are engaged mainly in maintenance. The canned sardines leave the plant in trucks, and are sold mainly in the southern part of the United States.

Rockland Boat Shop

Rockland Boat Shop is located in an older building on Wharf Street, behind the Marine Colloids plant. In the past, the company used to build large boats. At present, it builds only skiffs. The company, however, operates one of the best fisherman's supply stores in Maine, and carries a wide variety of paints, rope, machine parts, foul weather gear, etc.

R and R Engineering

This firm is located in a new steel building on U. S. 1 about one and a half miles south of the center of Rockland. It was begun in 1964 and now employs 26 people who work two shifts. The firm does custom metal work of all kinds, and has a machine shop and fabricating operation. Most

of its orders come from paper plants and food processing plants in other cities of Maine. The company also does a lot of work locally for Marine Colloids, and fabricates steel pulpits, booms, tanks, etc. for local fishing boats.

Communications, Inc. and Coastal Electronics

These firms operate small stores on Tilson Avenue about one block from the docks. They sell and repair a wide variety of electronic gear used on commercial fishing boats, including radar, Loran C, Loran C plotters, flashers, depth recorders, fish scopes, radios and transducers.

Holmes Packing Company

This company operates a very large sardine canning plant, located on a wharf at the southern end of the Rockland waterfront. It usually operates between June and December. The plant has two long canning lines, capable of employing some 230 packers. In 1978-79, due to the problem of obtaining labor only 130 were employed. The firm obtains its fish from about 15 purse seiners and stop seiners from Portland to Jonesport, Maine. The company also owns one purse seiner of its own which operates out of Rockland. The fish are transported to the plant by the company's own carriers, the "Jacob Pike" and "Quick Step II." Most of the market is in the southern part of the United States.

Port Clyde Packing Company and the Sanco Division

This company operates a large packing plant at Rockland, and two others at Stonington and Yarmouth, Maine. The three plants together produced 300,000 cases of sardines, which makes it the largest sardine packing company in the United States. These plants pack most of their herring between June and November, but stay open all year. During the peak season, the Rockland plant employs 150 people. Only 30 are employed permanently all year round. Most of these people are employed packing sardines into 4 ounce tins, but a few operate the plant's two Baader herring filleting machines. Like the other sardine plants operating in the Rockland area, the packers come from Rockland and other smaller communities within a 25 mile radius.

Port Clyde Packing Company plants obtain their herring from some 45 fishermen, located from Cape Elizabeth to Robinston. It also buys a lot of fish from Canada. Most of the fish caught in Maine are transported to the Rockland plant by the company's carriers, the "Delca" and "Nereid," which are generally stationed in the Rockland area. In some years, a very high proportion of fish is imported from Canada or comes from Massachusetts. Fish from these distant locations comes to the Rockland plant by trucks, which load their herring at the L. Ray pumping station in Lubec or in Gloucester, Massachusetts.

The canned herring are all sold in the United States; the filleted herring are frozen and shipped to Europe.

The company also operates a can manufacturing plant, the Sanco Division of Port Clyde Foods. This plant is located in the Rockland Industrial Park, and employs about 40 people. In 1978, the plant produced about three million cans and covers which were used only by the three Port Clyde Packing Company plants.

Recently, Port Clyde Foods, Inc. has been purchased by Zapata Food Products of Houston, Texas. In the near future, Zapata plans to supply herring to its three Port Clyde plants in the winter by fishing off Georges Bank. This fishing operation would be carried out by two 119 foot vessels which will alternate between the New England herring industry in winter, and the southern menhaden industry in the warm months of the year.

Sea Pro, Inc.

Sea Pro operates a plant at the north end of Rockland harbor which manufactures oil and fish meal from herring remnants. The plant employs 16 permanent workers and about 35 in the summer peak

season. The herring remnants are purchased from nine plants located in Rockland, Prospect Harbor, Belfast, Southwest Harbor, and Bath. The fish are transported to the plant in Sea Pro's trucks, where they are first driven into a large cooker by an auger, and then put through a centrifuge to separate out the oil. The solids are then dried and ground up into meal. The oil is sold through a broker in Boston to firms who use it to tan leather and to make rust proofing paint and lubricants. The meal is sold in Maine as poultry rations. Some of the meal is trucked to Belfast to Maplewood and Penobscot Poultry companies. A small amount of the fish meal is converted into artificial lobster bait and sold in five gallon pails under the MK 12 label.

Stinson Canning Company

This company operates a new, modern plant located on a wharf at the southern end of Rockland. This plant processes herring and groundfish, using two very different operations. The herring are either unloaded from trucks or boats, and are then filleted automatically by eight Baader filleting machines. They are then packed into 20 kilo boxes, plate frozen, and stored in a large freezer room. They are then trucked to Gloucester, and transported to the European market in refrigerator ships. Groundfish and flatfish are generally unloaded from boats. The average-size groundfish are filleted by a Baader filleting machine. The large and small groundfish are hand-filleted by seven fish cutters. All of the flatfish are currently filleted by hand as well, although a flatfish filleting machine will be installed soon. The groundfish and flatfish fillets are either plate frozen and sold to National Sea Products in the form of fish blocks, or else are packed in boxes and transported to Boston, New York or Gloucester where they are sold on the fresh fish market.

The Stinson Company also operates a warehouse near its Rockland plant, where it puts cellophane on boxes of canned herring from its other plants and stores them before shipment.

When both the groundfish and herring operations are functioning the Stinson plant employs about 80 people. About 50 of these people work on the groundfish line, which is not as automated as the herring operation.

McLoon Lobster Company

McLoon Lobster Company is owned by Bay State Lobster Company of Boston. It has a small office in Rockland, on McLoon's wharf off Commercial Street near the central part of town, and maintains a buying station at Spruce Head. The Rockland office employs three people. In the past, the company bought lobsters at its Rockland wharf, but does not do so any longer.

The buying station in Spruce Head employs three people, who buy lobsters and supply fishermen with bait, gas, etc. These men also operate the company's two pounds on Hewitt Island in the Muscle Ridge channel nearby.

At the height of the season, some 55 fishermen sell their catch to McLoon's buying station; only five or six of these men really go fishing 12 months a year.

McLoon Lobster Company sells all of its lobsters to Bay State in Boston, which in turn markets them all over New England and the United States. The company operates no retail outlet, and does no wholesaling independently. The company employees, using company trucks, transport lobsters as they are needed in Boston from the Maine buying stations and pounds.

Prock Marine Corporation

Prock Marine Corporation maintains offices on Main Street in Rockland, and has a large wharf at the northern end of town which it uses to store its equipment, and as a tie-up place for its barges. The corporation specializes in dredging and dock construction all along the Maine coast. The company's most important pieces of equipment are six large steel barges (90 to 110 feet), which are equipped with derricks and cranes.

VINALHAVEN

Physical Setting and Population

Vinalhaven Island is located in the center of Penobscot Bay, about 6.5 miles due east of Owls Head, the closest place on the mainland. There is one major settlement on the island, the town of Vinalhaven, on Carver's Harbor, near the southernmost tip of the island. In the winter the population of Vinalhaven is estimated at 1135. In the summer, with the influx of tourists, it grows to an estimated 2500.

Major Industries and Economic Pursuits

Fishing is the largest single source of jobs on Vinalhaven. An estimated 240 people work either on fishing boats or in closely related occupations (i.e. boat building, fishing cooperative, etc.). There are no plants on the island of any kind, although a fish processing plant is currently under construction, which will employ a maximum of 30 people by 1980.

Most of the tourists who come to the island own cottages there. There is one small motel with about 12 rooms catering to transient tourists. There are two restaurants on the island and two take-out places, but they are oriented toward the local trade. None of these restaurants is what Maine people call a "fancy tourist place."

There are some eight stores along the main street of Vinalhaven, and several people run small service businesses (dry cleaning, diesel mechanic, auto mechanic, etc.).

General Infrastructure

The island can be reached by auto passenger ferry (17 car capacity) operated by the Maine State Ferry Service. The ferry runs between Rockland, and Carver's Harbor (on Vinalhaven) three times a day in the summer and twice a day in winter. There are about 10 miles of paved, state-maintained road on the island, and another 34 miles of roads maintained by the town of Vinalhaven. There is a private airfield on the island.

Vinalhaven residents are generally independent of the mainland. There is a small clinic on the island with a resident physician, a dentist, and four nurses. There are four grocery stores in Vinalhaven, two hardware stores, a variety store, a plumbing and electrical shop which sells and services appliances, a sawmill and two trap stock mills. The Vinalhaven Fuel and Marine Company supplies gas and heating oil.

Vinalhaven also has both an elementary school and a high school. In 1978, 247 children were enrolled in all 12 grades.

Port Infrastructure

There are five anchorages in use at Vinalhaven. The most important is at Carver's Harbor, which is bordered by the town of Vinalhaven. Virtually all the maritime-oriented facilities are located here, including all the fish and lobster buyers, boat yards, and the ferry terminal. The vast majority of the boats are moored here. Ten or twelve are located at "Old Harbor" near a small settlement called "Dogtown," on the southwestern section of the island about two miles from the village of Vinalhaven. Another 10 or 11 lobster boats are moored at Robert's Harbor, on the southwest side of the island.

About 10 or 12 boats are moored in the Fox Islands Thorofare between Vinalhaven and North Haven. Most of these are yachts and small boats used by clam diggers. There are no large wharfs or facilities at any of the small anchorages (i.e. Dogtown, Robert's Harbor, Fox Islands Thorofare).

The U. S. Coast Guard maintains a manned lighthouse at Heron Neck and another manned light at Brown's Head, at the entrance of the Fox Island Thorofare. Goose Rock light at the easterly end

of the thorofare is automatic.

There are six small boat yards on Vinalhaven, the three most important being Hopkins boat yard and Lee Osgood's boatyard, both at Carver's Harbor, and Skoogs boat shop at Sand Cove.

There are two town wharfs, one at Carver's Harbor, and the other on the Fox Island Thorofare on the north part of the island.

Types of Fishing

Vinalhaven is one of the largest and most active fishing ports on the Maine coast. Lobstering and scalloping are the most important activities. Some herring fishing has always been done on the island and in recent years a large number of fishermen have begun to go gillnetting.

Lobster

1. Number of Boats, People, and Fishing Areas

An estimated 140 local men earn a major portion of their income by lobster fishing. Most of them have inboard-powered lobster boats between 30 and 38 feet long. However, about 25 full-time lobster fishermen have recently bought large open skiffs powered by large outboard motors, with a "power takeoff" to run their lobster haulers. In addition, there are an estimated 80 young men and boys who fish during the summer in small outboard-powered skiffs. Vinalhaven fishermen fish only around the island itself and the outer reaches of Penobscot Bay in the area of Seal Island. Island fishermen do little "mixed fishing" with men from Stonington, Rockland or other mainland harbors.

2. Marketing

The vast majority of the fishermen sell all their lobsters to the Bay State Lobster Company in Carver's Harbor. A far smaller number of men (perhaps 14) sell to the Vinalhaven Cooperative. There is a third buyer who has recently begun to purchase lobsters from a lobster car anchored in Robert's Harbor. Under 20 fishermen bring their lobsters to Robert's Harbor for sale. Most fishermen buy fuel at Vinalhaven Fuel and Marine Company, but fuel can also be obtained at the co-op.

3. Processing

None.

Herring

1. Number of Boats, People, and Fishing Areas

There are three vessels in the 50 foot range (5 to 6 man crews) which go purse seining regularly. In the early summer they begin fishing off Matinicus Rock, and then off Seal Island. In the fall, they generally fish around Vinalhaven itself or other places up Penobscot Bay.

There are also five or six groups of men who regularly go stop seining in the coves around Vinalhaven. Such gangs involve about six or seven men, who earn most of their income from lobstering.

2. Marketing

Most of the purse seiners and stop seine operators of Vinalhaven have loans from Bay State. The herring are generally sold to factories in Rockland or Stonington. The loans from Bay State are repaid by giving the company a certain percentage of the catch.

3. Processing

No herring are processed on Vinalhaven.

Scallops

1. Number of Boats, People, and Fishing Areas

In recent winters (during the late 1970s) an estimated 12 lobster fishermen have rigged up for scallop fishing in the winter. Most of these boats carry two to three man crews and operate in fishing grounds within 10 miles of Vinalhaven, in Penobscot Bay.

2. Marketing

Virtually all the scallops caught by Vinalhaven boats are sold to Bay State Corporation or the co-op. Smaller amounts are sold to grocery stores and individuals.

3. Processing

None.

Clams

1. Number of People and Fishing Areas

About 15 Vinalhaven men earn most of their income through clamming. All of them dig flats around Vinalhaven or North Haven.

2. Marketing

Bay State buys most of the clams dug by Vinalhaven fishermen.

3. Processing

None.

Groundfish

1. Number of Boats, People, and Fishing Areas

In recent years several lobster fishermen have gone gillnetting on a full-time basis. At present, there are three 50 to 62 foot vessels which go gillnetting through the year. These boats not only go fishing in the outer reaches of Penobscot Bay, but fish as far away as Cashes Ledge, and other fishing grounds over 100 miles to the south. Two of these skippers have been selling their catches in Portland and Gloucester. There are three 42 foot Bruno and Stillman boats which gillnet for groundfish throughout the year within 30 miles of shore. There are also two or three lobstermen who have just begun to experiment with gillnetting. They have only two or three man crews and fish 5 to 15 nets within Penobscot Bay. If successful, they too will probably buy larger boats, and go gillnetting throughout the year.

2. Marketing

Bay State has not purchased groundfish for the past two years. Currently most Vinalhaven gillnetters sell their catches in Portland, but two or three bring their fish to Rockland on occasion. Most will probably sell fish locally when the fish processing plant opens for business.

3. Processing

No groundfish are processed locally.

Important Institutions Related to Fishing

Vinalhaven Fishermen's Cooperative

There are about 14 fishermen who regularly sell their lobster catches to the Vinalhaven Cooperative. The nominal membership is somewhat higher. The Cooperative maintains a dock at Carver's Harbor, where it sells gas and bait to cooperating members.

Bay State Lobster Company

This company maintains a large dock and buying station at Carver's Harbor. The company buys a large percentage of the lobsters produced by Vinalhaven fishermen, along with all of the scallops and clams. The company has 10 employees at its Vinalhaven facility. Bay State trucks all of the seafood it buys to its Boston headquarters.

Vinalhaven Fish Plant

Construction has just begun on this fish plant, which will be located at Carver's Harbor. The plant is expected to cost about \$1,000,000 when completed. It will have a large blast freezer and employ about 30 people when it goes into operation in 1979. The company is being financed by a common stock issue, which several local people are planning to invest in. The company plans to produce 20 pound boxes of frozen groundfish at first, and then expand into other fish products.

NORTH HAVEN

Physical Setting and Population

North Haven Island is located in Penobscot Bay, in the central part of the Maine coast, just north of the island of Vinalhaven. Vinalhaven and North Haven are separated by the Fox Islands Thorofare which is less than one-half mile wide in most places. North Haven is about seven miles long by two and a half miles wide. There is one village on North Haven Island called North Haven, located on the southerly shore of the island in the Fox Islands Thorofare. The village of North Haven lies about ten miles east of Rockland and some eight miles west of Stonington. North Haven Island had a permanent population of 399 in 1970; in the summer the population expands to an estimated 1500.

Major Industries and Economic Pursuits

North Haven is the site of several very large estates owned by some of the wealthiest families in the United States. The estates dominate the local economy. Some 20 or 22 men are caretakers on these estates throughout the year. For 12 men, caretaking is a full-time occupation; another 10 men do caretaking on a part-time basis. There are also four small construction firms, employing from three to six men each, who work for the "summer people," maintaining mansions, called "cottages," and building new structures. Some 25 men are involved in fishing--most on a part-time basis. There are two stores on the island, and two boat yards, which employ another 5 or 6 men each. Most of the "tourists" own "cottages." There is only one small restaurant, and the "Village Inn" has only four or five rooms. There are no industrial plants of any kind.

General Infrastructure

There are at least a dozen very large estates on North Haven covering most of the land on the eastern, western, and northern shores of the island. One of them has some 18 mansions attached, and this estate is not unusual. The estate owners run the North Haven Casino, which operates a yacht club, tennis courts, and a nine hole golf course. The Casino is the focal point of social life on the island. Waterman's store in North Haven reflects the upper class taste of the island's summer population. It is perhaps the only general store in Maine where one can buy truffles, fine wines, and a whole assortment of imported luxury foods. Most of the permanent residents go to Rockland once to twice a month to do shopping and run errands.

The community has a grammar school and a high school with some 87 students. There is also a clinic with a permanent physician hired by the town.

Port Infrastructure

Most of the boats are moored in the Fox Islands Thorofare. This harbor is very protected and is ordinarily completely free of ice in the winters. The J.O. Brown boat yard and lobster wharf is in the Thorofare near the village of North Haven, along with the Yacht Club and one of the town wharfs.

Pulpit Harbor, on the northwest coast of the island, is one of the most protected deep water anchorages in Maine. Unfortunately, it regularly freezes during the winters. This harbor is regularly used by six lobster boats in the summer and more than a dozen yachts. There is a town wharf located at Pulpit Harbor, but no other facilities of note except the estate houses which are set back from the shore.

Types of Fishing

Fishing is a secondary occupation on North Haven. Most of the men who go fishing are engaged in lobstering.

Lobster

1. Number of Boats, People, and Fishing Areas

There are approximately 25 men from North Haven who go lobstering. However, only two of these men can be considered "full-time fishermen." Of the 23 part-time fishermen, approximately 9 or 10 have large inboard-powered lobster boats; the other 13 fishermen have outboard-powered skiffs which are used only in the summer.

2. Marketing

Most of the lobsters caught on North Haven are sold to J. O. Brown. A small number of fishermen sell their catches to the Stonington Cooperative or other dealers in Stonington. J. O. Brown and Sons also supplies most fishermen with bait and gas.

3. Processing

None.

Scallops

1. Number of Boats, People, and Fishing Areas

In the winter of 1979, 11 lobster boats from North Haven rigged up for scalloping. Nine of these boats belonged to part-time fishermen and went scalloping only on the weekends or once or twice a month. Two boats went on a full-time basis. None of the boats in the scallop fishery was over 40 feet long. Scallop fishermen from North Haven went all over Penobscot Bay and to areas further east around Swan's Island. They do not regularly go fishing to the westward (i.e. around Monhegan, etc.).

2. Marketing

All of the scallops from North Haven Boats are marketed at J. O. Brown's in the village of North Haven.

3. Processing

None.

Minor Fisheries

A few men from North Haven go clamming on a part-time basis. There is also one stop seining gang operating from North Haven. Most of these men are also involved in the lobster industry. When these North Haven men catch herring, they are sold to Holmes Packing Company in Rockland. They regularly seine in the coves on the western side of the island and along the Fox Islands Thorofare (i. e. Carvers' Cove, Southern Harbor, Whistler's Cove, Bartlett's Harbor, and Pulpit Harbor). The coves on the eastern and northern ends of the island are regularly stop seined by crews from Stonington.

MATINICUS AND CRIEHAVEN

Physical Setting and Population

Matinicus Island lies about 23 miles south of Rockland, the largest of a group of islands in the entrance to the western part of Penobscot Bay. Ragged Island, or Criehaven, lies about 3/4 of a mile south of Matinicus. There is a lighthouse and Coast Guard station on Matinicus Rock, the outermost island of the group. In recent years approximately 100 people have lived on Matinicus throughout the year, although their numbers are now declining steadily. There are approximately 250 people in the summer. Criehaven is not regularly inhabited in the winter, although one or two people have stayed on the island in recent winters. An increasing number of houses and cottages on both islands are owned by summer residents who are not fishermen or by seasonal fishermen who reside on the islands from early spring until late fall and who spend the winters inshore where many of them own permanent homes. There is relatively little interaction between the residents of the two islands. The community on Matinicus is organized as a plantation, the smallest self-governing body recognized in Maine, with some, but not all, of the organizational characteristics of a town. Criehaven has been unorganized territory since 1925, when its residents petitioned to end plantation government.

Major Industries and Economic Pursuits

Fishing is virtually the only economic activity on both Matinicus and Criehaven. There are no commercial farms or industries on either island. There are very few facilities for tourists. Various residents rent houses and cottages to summer visitors, and some women take in boarders on Matinicus.

General Infrastructure

A 65 foot passenger ferry capable of transporting cars, large numbers of passengers and freight used to run between Rockland and Matinicus, three days a week in the summer and two in the winter. Since this boat was condemned by the Coast Guard in 1977, the only scheduled passenger service to Matinicus has been provided by a man from Rockland who holds the mail contract and carries freight and up to six passengers in his lobster boat. Resident fishermen and their families go to and from the mainland in their own boats. Many people use Stonington Flying Service, an air taxi service based at Knox County airport, to come and go since there is a good dirt airstrip on the island. Several of the younger fishermen own small planes. There are about five miles of dirt and gravel roads on Matinicus. Most residents keep a vehicle on the island as well as one on shore.

The only store on the island is located at the harbor, adjacent to a large stone wharf. The store sells primarily food, hardware and fuel: propane, gasoline, diesel and home heating fuel. The owner of the store is also postmaster. Electricity is supplied by a plantation-owned, diesel-powered generating plant located near the store.

There are no graded roads, stores or post office on Criehaven. Residents shop and obtain services on the mainland. There is no regular passenger or freight service to Criehaven.

There is a one-room elementary school on Matinicus, built in 1969. Students from the island of high-school age attend either Rockland area high schools or a variety of private preparatory schools. There is no school on Criehaven. All children of school age go to the mainland during the school year.

Port Infrastructure

There is one small harbor on Matinicus located on the northeast side of the island, protected from storms by a granite breakwater and an adjacent smaller island. There are roughly 36 moorings in the harbor, owned and used almost exclusively by the island lobstermen. Since all available safe mooring space has long since been occupied, the unavailability of moorings sets an effective limit on the number of boats which can fish from Matinicus harbor. The stone wharf belonging to the store

serves as a town wharf for most purposes, although most lobstermen own or have access to wooden wharves around the harbor. The sole remaining lobster buyer operates his business from a large car anchored in the harbor.

The harbor at Criehaven is smaller than that of Matinicus but is protected by a breakwater on the northwest, the only exposed side. There is less of a shortage of mooring space in this harbor since many fewer fishermen moor there than in Matinicus harbor. The five or six small wharves on Criehaven all belong to individual fishermen or summer residents.

Types of Fishing

There is one boat on Matinicus used for purse seining and dragging. All of the other boats on Matinicus and Criehaven are used for lobstering. No worming, clamming, or scalloping is done on either island.

Lobster

1. Number of Boats, People, and Fishing Areas

There are 30 active lobster fishermen on Matinicus and another eight or nine in Criehaven. Boats range in size and capability from peapods and outboards to wooden or fiberglass inboard boats of 40 to 42 feet in length.

The lobstermen of Matinicus and Criehaven each have their own separate fishing areas. Fishermen from Criehaven fish in an enclave around their own island, which extends to the south and west and is surrounded by Matinicus territory. The men from Matinicus fish more to the north of their island, and go as far as Seal Island to the east, to the Green Island line to the west, and as far south as Matinicus Rock, as well as around their own island.

2. Marketing

Roughly half of all the lobsters caught by Matinicus Island fishermen are sold to Art's Lobsters (Tenant's Harbor), which maintains a large car moored in the harbor from which the resident "buyer" operates. Periodically a lobster smack comes from Tenant's Harbor to pick up the lobsters and deliver bait. The rest of the lobsters are sold by individual fishermen to dealers in Owl's Head, Spruce Head, and Rockland. All of the lobsters caught by Criehaven fishermen are stored in individual cars and transported to shore weekly to be sold to dealers between Port Clyde and Rockland. None of the fishermen from either Matinicus or Criehaven deal in Stonington, although a number take their boats there for maintenance.

3. Processing

None.

Minor Fisheries

Over recent years there have been two or three crews operating stop-seine rigs from Matinicus. These groups shut off coves around the islands for herring and sell their catches to carriers from various packing companies. The owner of one of these rigs also owns a 50 foot general purpose fishing vessel with which he and a crew of six or seven men go purse seining for herring, dragging for groundfish or shrimping. He sells primarily to Port Clyde Packing Company. In past years other Matinicus fishermen have owned large boats with which they fished for herring, shrimp or scallops. A number of lobstermen set halibut trawls or catch small quantities of other fish primarily for their own uses or for sale locally.

OWLS HEAD

Physical Setting and Population

The town of Owls Head is on a peninsula jutting out in Penobscot Bay. The center of the town is about three miles east of the city of Rockland. In 1970, the population of Owls Head was 1281. In the summer, the population of the township is perhaps 2200 since there are a lot of summer homes. Most of the winter and summer residents do not live in Owls Head village, near the harbor, but rather have houses scattered along the highways and shore.

Major Industries and Economic Pursuits

Most of the Owls Head residents of working age are either in the fishing industry or commute to nearby Rockland to work. There are no local industrial plants. Moreover, the town has no shopping district, professional offices, or facilities for transient tourists, save for the Crescent Beach Inn. Besides the ocean beaches, the town does have one attraction for transient tourists--namely the Transportation Museum, located at the airport.

General Infrastructure

Owls Head can be reached on Route 73. Downeast Airlines provides scheduled airline service from the Knox County Regional Airport, which is in the township of Owls Head. The nearest railroad trunk line is in Rockland. There are only two small convenience stores, and residents of the town generally go to Rockland to do their shopping and obtain professional services. However, the town does have a grade school and high school.

Port Infrastructure

Owls Head harbor has a large, well-protected anchorage lying between the mainland and Monroe Island where most of the boats are moored. There is no shortage of mooring spaces. Most of the boats at Owls Head are fishing boats; there are few yachts or other pleasure boats. There is one large wharf at the harbor, which belongs to P. K. Reed and Sons, the local lobster dealer. Beside Reed's wharf is the town dock and launching ramp. The beach is very hard near the town dock, and many fishermen drive trucks on the beach and work on gear and boats there. There is also a very large pound on Owls Head harbor, capable of holding in excess of 100,000 lbs. of lobsters. This pound, and the small dock next to it, is owned by the Owls Head Lobster Company. There is an unmanned lighthouse on Monroe Island and a manned lighthouse at Owls Head, on the mainland.

A smaller number of boats are moored along the Weskeag River, between Spaulding Island and the bridge at South Thomaston. There are no facilities along the river, save for a few private docks.

Types of Fishing

Most fishermen from Owls Head are lobstermen. Very few men are involved in any other kind of fishing.

Lobster

1. Number of Boats, People, and Fishing Areas

There are between 35 and 40 lobster fishermen in Owls Head. Some 24 of these men have their boats moored in Owls Head harbor itself. The other 10 or 12 operate from the Weskeag River. Approximately 10 of these boats are small skiffs used in the summer; the others are all standard inboard-powered lobster boats. The Owls Head fishermen and those fishing from the Weskeag have two different fishing areas. Only 12 or 14 men from Owls Head are full-time lobstermen. The rest have jobs in Rockland or Thomaston. In the spring, two or three of the

full-time fishermen have gone dragging, and then have returned to lobstering in late summer.

There are also another nine lobstermen from Owls Head who moor their boats at either Tenants Harbor or Spruce Head and fish off Metinic Island, Little Green Island or Green Island. These men are full-time fishermen.

2. Marketing

Most of the lobsters caught by the Owls Head fishermen who have their boats moored in Owls Head harbor are sold to P. K. Reed and Sons, the largest local dealership, which also supplies fuel and bait. Another ten sell to Owls Head Lobster Company. Some of the fishermen who have boats moored in the Weskeag also sell to P. K. Reed, but more of them sell their catch to the dealers on Spruce Head Island.

3. Processing

None.

Minor Fisheries

There is one 55 foot wooden dragger which makes Owls Head its home port. This boat and permanent crew of three drag for scallops most of the time. In recent years, it has gone scalloping in the summer off Chatham, Massachusetts, and in the Penobscot Bay area during the winter. During part of the annual cycle they also fish for groundfish.

Approximately 5 people from Owls Head do clamming on a part-time basis.

Important Institutions Relating to Fishing

Owls Head Lobster Company

This company owns a very large lobster pound located at Owls Head harbor. It buys lobsters from a few dealers in Maine and from Canadian firms, as well as from 12 local fishermen. However, it does not supply bait or fuel. The company transports most of its lobsters to New York in its own truck.

THOMASTON

Physical Setting and Population

The town of Thomaston is on the St. George River, about nine and a half miles from Caldwell Island, where the river empties into Muscongus Bay. Four miles to the east is the city of Rockland. A very high percentage of Thomaston's 2646 people live in the nucleated section of town along the St. George River.

Major Industries and Economic Pursuits

Although Thomaston is one of the prettiest towns in Maine, with its old Colonial houses and elm-lined streets, it is not a tourist town. It is the site of the Maine State Prison, located on the western edge of town, which employs over 200 people. Between Thomaston and Rockland is the gigantic Martin Marietta cement plant with some 350 employees. The community is also very close to Rockland. Most of the people in Thomaston are employed either at the prison or the cement plant, two of the largest employers in the Rockland/Thomaston area, or else work in Rockland itself.

General Infrastructure

Thomaston is located on U. S. 1. A spur line of the Maine Central Railroad runs along the waterfront. It does have a small shopping district in the center of town housed in old brick buildings, but the people of Thomaston do much of their shopping and obtain professional services in nearby Rockland. Two very large installations are located in town: the State Prison and State Police Barracks, and the Martin Marietta plant.

Port Infrastructure

Thomaston is located at a point where the St. George River narrows considerably and goes over a set of falls behind the prison. Below Thomaston the river is about one-half mile wide, and is open for navigation by vessels from open ocean. Above the falls at Thomaston, the river is only 100 yards wide and is completely unnavigable. All of the moorings are located in the river itself within half a mile of the falls. This anchorage is relatively protected, but can only be used by relatively small boats (under 80 feet).

The waterfront at Thomaston is oriented towards recreational boating--not fishing. Anchorage Marine repairs and stores small pleasure boats and provides supplies for them. It also has a franchise for Evinrude motors. Snow Harbor Corporation runs a marine supply store, and sells Grady White pleasure boats. It also operates a marina at a separate dock. There are two companies which build boats: the R. L. Wallace Company and the Morse Boat Building Company. The R. L. Wallace Company has three marine railways and builds and repairs boats up to 80 feet long. Most of the boats its 12 employees build are wooden draggers. The Morse Boat Building Company has a railway and repair service. It builds yachts and a few lobster boats. Morse employs about six people.

Types of Fishing

There are only a few boats located at Thomaston. Several men from Thomaston are fishermen, however, and either work on large boats out of Rockland, etc. or else keep their own boats at Pleasant Point at the mouth of the St. George River.

Lobster and Crabs

1. Number of Boats, People, and Fishing Areas

There are four inboard-powered lobster boats and three or four skiff fishermen who go fishing

in the St. George River during the summer. All of these men fish on a part-time basis.

2. Marketing

There is no lobster dealer in Thomaston. Most of the fishermen take their catch to the dealer in Pleasant Point or go to Rockland. Most of them obtain their bait in Rockland.

3. Processing

None.

Minor Fisheries

There is one small dragger which is moored in Thomaston. This boat is used on a part-time basis by a fisherman who spends much of his time working on a large herring operation based at Tenants Harbor. He generally tows the area around Burnt Island and sells his fish in Port Clyde. Some 12 to 15 men earn part of their income clamming.

Important Institutions Related to Fishing

Dragnet Seafood

This family firm operates a small cutting house and wholesale fish operation on Route 131, about three miles from the center of Thomaston. The firm has one truck, a cutting house attached to the family home, and a small smoke house behind that. All five employees are family members. The firm buys most of its fish from local dealers--primarily in Rockland. Periodically, fish and scallops are purchased from dealers in Massachusetts. The fish are filleted by family members; the racks are sold to a Port Clyde lobsterman for bait. Most of the fish are transported in the company truck and sold directly to restaurants in the north-central part of Maine.

SPRUCE HEAD

Physical Setting and Population

Sprucehead Island is about seven miles south of Rockland on the western shore of Penobscot Bay. It is about one mile long and is connected to the mainland by a small causeway perhaps 500 yards long. The village of Spruce Head itself is on the mainland close to the causeway running to Sprucehead Island. Sprucehead Island and the village of Spruce Head are in the township of South Thomaston. In 1970, the town of South Thomaston had a population of 831. Perhaps half of these people live in either Spruce Head or on Sprucehead Island nearby. All of the installations connected to fishing are located on the island, along with a good many seasonal "camps." The village of Spruce Head contains houses occupied by permanent residents.

Major Industries and Economic Pursuits

Fishing is the largest industry in Spruce Head. There are no industrial plants. However, an indeterminate number of the residents from South Thomaston work in plants either in Thomaston or in the city of Rockland. Although there are a good many summer residences on Sprucehead Island and along the shore, there are few businesses catering to transient tourists. There are no hotels or motels in Spruce Head or on Sprucehead Island, and only a couple of small take-out eating places.

General Infrastructure

Spruce Head and Sprucehead Island may be reached only by automobile or by boat. There is only one general store on Sprucehead Island, and only a couple of other small stores in other parts of South Thomaston. Residents of the area do all their shopping and obtain all professional services in the Rockland area.

Port Infrastructure

There is one anchorage used in the Spruce Head area, off the southern end of Sprucehead Island itself (i.e. Seal Harbor). At this anchorage there are three docks operated by lobster buyers: the Spruce Head Fisherman's Cooperative, William Atwood, and McLoon Lobster Company. This anchorage is very large, and has ample room for additional moorings, but it is only moderately well-protected.

Few yachts or pleasure boats are moored at Spruce Head. There are no facilities to attract transient tourists, except for the "Shamrock" and the "Dolphin," two 40 foot boats which take out fishing parties in the summer.

Types of Fishing

Lobster

1. Number of Boats, People, and Fishing Areas

There are approximately 55 lobster boats in the Spruce Head area. Some 39 of these are standard inboard-powered lobster boats. In addition, there are another 15 or 16 skiff fishermen. Virtually all of the skiff fishermen fish only during the summer months, and have jobs elsewhere. A very high proportion of the fishermen with inboard-powered boats are full-time fishermen.

The vast majority of the fishermen whose boats are moored at Spruce Head fish in fishing areas near shore. However, nine men who fish an exclusive fishing area around Metinic Island moor their boats at Spruce Head and sell their lobsters there.

2. Marketing

There are four lobster buyers in the Spruce Head area. Atwood Brothers has one dock on Sprucehead Island and regularly buys from about 25 fishermen. There is also the Spruce Head Lobsterman's Cooperative which regularly buys from another 15 to 18 lobstermen, and McLoon's which buys from another 15 men. In addition, Maine Coast Seafood operates a pound on Sprucehead Island and another near Tenants Harbor. This company regularly buys lobsters from approximately 25 fishermen. Most of the fishermen selling to these four dealerships come from Spruce Head or parts of the township of St. George, but a large number of fishermen from the Penobscot Bay islands, especially Matinicus and Criehaven, also sell substantial numbers of lobsters to these four establishments.

3. Processing

A large number of lobsters are cooked and picked by Atwood Brothers, which sells the lobster meat.

Minor Fisheries

One man, who lives on Matinicus part of the year and in Spruce Head the rest of the time, owns a boat about 40 feet long which he regularly uses to purse seine and stop seine for herring in local waters. This boat and associated seine boats and twine dories are usually kept at Spruce Head. The herring caught by this four man crew are usually sold to Port Clyde Packing Company in Rockland.

There are also three or four men who earn most of their income clamming, and another six men from the town who go clamming on a part-time basis. Most of these clams are sold to Atwood Brothers.

No local people regularly earn a living by digging marine worms, but several flats near Spruce Head are regularly exploited by men from other towns.

In recent years, three or four lobstermen with large boats have gone groundfishing in the spring of the year and a few men have begun to scallop in midwinter. All of these men have returned to lobstering in the late summer.

Important Institutions Related to Fishing

William Atwood

This firm, located on Sprucehead Island, buys and ships large numbers of lobsters. The company has a dock where it buys lobsters from about 25 full-time local fishermen, and some from Matinicus and Criehaven. It also supplies these men with bait and fuel. Across the road, next to the store, is the company's shipping plant. This long, low building is filled with tanks used to store lobsters.

McLoon Lobster Company

This company buys lobsters from about 15 local fishermen on its dock at Sprucehead Island, and supplies them with fuel and bait. It also imports a large number of lobsters from Canada, and buys from other dealers in Maine. The lobsters are stored before shipment in a large pound the company maintains on Hewitt's Island, in the nearby Muscle Ridge Channel.

McLoon Lobster Company is actually owned by the Bay State Corporation of Boston. All of the company's lobsters are shipped to Bay State--usually on trucks owned by the parent company.

Maine Coast Seafood

This company, owned by Anthony's Pier in Boston, operates two pounds in the Spruce Head region.

On Sprucehead Island itself, the company has a small lobster pound and an office. It has another, much larger pound, near Port Clyde, a few miles further south. The company buys lobsters from local fishermen--particularly at its Port Clyde pound. Most of the lobsters it pounds, however, are purchased from other dealers in Maine or Canada.

Spruce Head Fishermen's Cooperative

This fishermen's cooperative was begun in the early 1970's. It owns a dock, managed by a full-time manager, on Sprucehead Island, where it buys lobsters. The cooperative has about 20 members, and regularly buys the catches of some 15 full-time fishermen, at least nine of whom fish off Matinicus Island in Penobscot Bay. The cooperative supplies bait and fuel to its fishermen.

Distinctive and Unusual Features of the Harbor

Spruce Head has several very large lobster shipping companies--more than any other town in the state.



PORT CLYDE AND TENANTS HARBOR

Physical Setting and Population

Port Clyde and Tenants Harbor are both fishing communities in the township of Saint George, at the end of a long peninsula extending out into the Gulf of Maine between Penobscot Bay and the St. George River. Tenants Harbor is about nine miles south of Thomaston on Route 131; Port Clyde is about three miles beyond that, on the very end of the peninsula.

Both Tenants Harbor and Port Clyde are relatively isolated, rural fishing hamlets. In 1970, the population of the township as a whole was 1639. About 600 people lived in Port Clyde; some 375 in Tenants Harbor; the rest in Martinsville or St. George, the other two hamlets in the township.

Major Industries and Economic Pursuits

Fishing is probably the largest single occupation in Tenants Harbor and Port Clyde. There are no industrial plants in either hamlet, or in the whole township of St. George for that matter. However, an estimated 100 people from both communities commute to Thomaston or to Rockland to work in industrial jobs in those communities.

The entire shoreline of the township of St. George is lined with cottages of "summer people." A dozen or 15 people in both hamlets earn part or all of their income constructing or maintaining these seasonal dwellings. However, there are very few facilities for transient tourists. There is one older hotel at Tenants Harbor and two smaller inns at Port Clyde. There are no large motels or hotel complexes in the township.

General Infrastructure

The Tenants Harbor-Port Clyde area can be reached by automobile on Route 131 which runs south from Thomaston and Rockland. The closest rail connections are at Rockland; the nearest airport is at Owls Head.

There is one general store, one hotel, and two small restaurant-store combinations in Tenants Harbor. In Port Clyde there is the Port Clyde General store catering to the tourist trade, and Morris' store, which carries food staples for local people. There are also four small short order restaurants open only in the summer, including "Dipnet Restaurant," near the Monhegan Island ferry dock. In the township, there are the three older hotels and inns mentioned before. Most of the permanent population and summer people go to Rockland to do their shopping and obtain services of all kinds.

Port Infrastructure

Both Tenants Harbor and Port Clyde have well-protected anchorages. Tenants Harbor is about two-thirds of a mile long and about one-fourth of a mile wide, and opens onto Penobscot Bay. At the mouth of the harbor are two islands which add further protection from north and east winds. About 30 fishing boats and yachts are regularly moored in Tenants Harbor, and there is room for more.

In Port Clyde, boats are anchored in a gut about one and a half miles long between the mainland and Hupper's Island. The anchorage is protected from the open ocean by Marshall's Point and Hupper's Island.

At Tenants Harbor there are four installations worthy of mention, all on the north shore. Near the mouth of the harbor is Art's Lobster Wharf, one of the largest lobster buyers in the area. A few feet away is a boat yard and dock owned by Hugo Lehtinen where fishing boats and herring carriers often tie up. Further down the harbor is the town wharf, a large stone-filled structure and a float. Near the head of the harbor is a marina serving the yachting trade and "The Cod End"

fish market. Both are operated by the Miller family.

At Port Clyde, there are several wharfs and installations of note. As one approaches Port Clyde from the sea, one passes first the Monhegan ferry boat landing and then the large public pier, launching ramp, and wharf. Then one comes to a small pier where Francis Morris unloads groundfish from boats and operates a small retail market. One hundred yards away is a dock on the site of the shrimp plant, which recently burned, where Gary Davis buys lobsters. Nearby are the dock and buildings, once owned by the Pine State Packing Company, where five or six draggers are usually tied up. Pine State Packing Company is no longer in business, and the facilities have been bought and resold several times to a series of firms which buy lobsters and fish and quickly go out of business. Perhaps half a mile up the harbor is the Port Clyde Lobsterman's Cooperative. Between the general store to the south and the cooperative at the northern end of the harbor is a whole series of small docks owned by individual lobster fishermen, which are piled high with traps at certain times of the year.

There are two lobster pounds at Port Clyde: one operated by Atwoods and the other by Edward Black.

Types of Fishing

Lobster

1. Number of Boats, People, and Fishing Areas

There are 72 active lobstermen in Tenants Harbor and Port Clyde. Twenty-seven are full-time fishermen, all of whom have inboard-powered boats over 30 feet long. The other 45 men are "part-time" fishermen. Thirty-five of those men have skiffs and operate only during the summer months and early fall; the other ten have inboard-powered boats between 25 and 35 feet long.

Lobstermen from Tenants Harbor and Port Clyde each have their own separate lobstering areas. The Port Clyde fishermen have an area which extends out to Allen's Island and Burnt Island, but does not go as far west as McGee Island and Gay Island, which is controlled by Pleasant Point fishermen. Tenants Harbor fishermen have an area between Martinsville and Racliffe Island. They do not fish off the Green Islands or Metinic, which are separate fishing areas.

2. Marketing

Fishermen in the area generally consistently do business with one of the four lobster buying concerns. About 18 or 20 men regularly sell their lobsters at Art's Lobsters in Tenants Harbor, including eight or nine who fish in special island areas in Penobscot Bay. Art's also operates a lobster smack and thus does a lot of business in Matinicus and Monhegan. Approximately 25 men sell to Blaine Cook in the summer; but only four or five of these men go fishing all year. A few of these men live in Pleasant Point. About 28 fishermen regularly sell to Gary Davis in the summer. Only eight of them go fishing in the winter. There are also 24 men who regularly sell to the Port Clyde Fisherman's Cooperative. All four of these lobster buying concerns supply bait and gas.

3. Processing

None.

Groundfish

1. Number of Boats, People, and Fishing Areas

There are 16 boats in Tenants Harbor and Port Clyde that fish for groundfish extensively throughout the year. Two large boats (67 and 68 feet) drag for groundfish throughout the year. One of these goes daytripping; the other regularly stays out two or three days at a time. Four boats in the 38 to 50 foot range also do nothing but drag for groundfish

throughout the year. Another five boats between 37 and 42 feet long drag for groundfish in the spring and fish for lobsters in the late summer and fall. Four boats in the 38 to 45 foot range combine dragging for groundfish with purse seining for herring and poggies. One boat is owned by the captain of a scallop dragger out of New Bedford. This boat is used for gillnetting in the periods between scalloping trips.

Most of the groundfish are caught either to the east of Port Clyde in tows off Metinic and the west side of the mouth of Penobscot Bay or southeast of Monhegan Island.

2. Marketing

In 1978 there were four groundfish buyers operating in Port Clyde: (1) Francis Morris, who transports fish to Boston and New York in his own two trucks, (2) R and S Seafood of Portland, which began to buy fish late in 1978, (3) Pine Tree Packing, which went out of business sometime early in 1979, and (4) a buyer operating from the Fisherman's Cooperative dock.

These four buyers purchase not only from Port Clyde boats, but from boats from other harbors in the area, and from transient boats which might be dragging or gillnetting around Monhegan and adjacent areas.

3. Processing

Francis Morris fillets some of the fin fish he buys to sell in his retail store at Port Clyde and also to sell on the wholesale market.

Herring

1. Number of Boats, People, and Fishing Areas

Two men who own draggers also operate stop seine operations. One has the traditional berth in Tenants Harbor itself, the other in coves close to Port Clyde. Two other Port Clyde dragger fishermen do a good deal of purse seining in the summer. Most of the time they work as a team and get much of their fishing in the waters of the St. George River and around the islands in Muscongus Bay.

Two other fishermen from the northern part of the township also go stop seining in the summer in coves close to Wheeler's Bay. Both of these men, and their crews, are fundamentally lobstermen and fish for herring on a part-time basis.

2. Marketing

The herring from all these operations are usually sold to one or another of the canning companies in Rockland--particularly Port Clyde Canning Company and Holmes.

The poggies purse seined are usually sold to local lobster dealers to be used as bait. Some are sold to the Sea Pro fish meal plant in Rockland.

3. Processing

No herring are processed in Tenants Harbor or Port Clyde, although there were two herring plants in Port Clyde operating into the 1960's.

Minor Fisheries

An estimated 15 to 18 men earn all or a good part of their income by digging clams. Most of these are sold to Francis Morris, the only clam dealer in Port Clyde.

Important Institutions Related to Fishing

Port Clyde Fisherman's Cooperative

This fisherman's cooperative was started immediately after World War II, but was rechartered in 1973. At present, it has about 35 members; some 24 fishermen regularly sell their lobster catches to the co-op. Recently, the cooperative dock has been used by a groundfish buyer. These fish are not owned by the cooperative itself, but are merely shipped over its dock.

The cooperative owns a dock and a set of buildings near the northern end of Port Clyde Harbor, which houses the office, bait shed, etc.

Marshall Point Coast Guard Station

On Marshall Point, about one mile from the center of Port Clyde, the U. S. Coast Guard operates a lighthouse and Loran A Station. There are about 12 Coast Guardsmen permanently attached to the unit to maintain and operate the Loran System. This Loran station is one of the most important ones used by fishermen in the Gulf of Maine.

Atwood Bros, Inc.

This company's facilities are located at Long Cove, near Clark Island, in the northern part of the township. It is one of the largest lobster shipping companies in the state, and maintains a large building filled with tanks to store live lobsters and a lobster picking room. Most of the firm's 15 to 20 employees spend most of their time packing lobsters in boxes with ice for shipment or else working in the picking room. Lobsters are hauled to market in the firm's own truck.

The firm regularly buys lobsters from 20 local lobster fishermen (12 full-time) who moor their boats near the company wharf. It also supplies these men with bait and fuel. The company buys a lot of its lobsters from other local dealers--particularly the Port Clyde Cooperative, as well as substantial numbers of lobsters from Canadian firms, which it brings to Maine in trucks.

MONHEGAN

Physical Setting and Population

Monhegan Island lies about nine and a half miles south/southwest from Port Clyde. The island is about two miles long and about three-fourths of a mile wide. It has been permanently occupied since the 1620's. Before that time, it was used as a fish drying station by European fishermen. At present, there are about 150 people who live on the island throughout the year. There is a large summer colony on the island, and three hotels and rooming houses catering to transient tourists. In July and August, the island may have as many as 1100 people on any given day.

Approximately two-thirds of the island belongs to the Monhegan Associates--including the whole eastern shore and much of the land in the northeastern sections. No building is allowed here. Thus, all the houses, cottages, hotels and shops are concentrated in a mile long strip along the harbor, in the southwestern sector of the island.

The island is a plantation, not a town, so that it qualifies for special kinds of state aid.

Major Industries and Economic Pursuits

Tourism and fishing are the only industries on Monhegan. A few of the people involved in fishing or tourism confine their activities to one occupation or the other. However, most adult men who are permanent residents are involved in both. In the early part of the century, Monhegan residents successfully petitioned the legislature to pass a special law prohibiting lobster fishing within two miles of the island from June to December. Thus, Monhegan fishermen concentrate their lobster fishing between January and June. In the summer, they devote their time to carpentry, taking out fishing parties, storekeeping, or other fisheries.

On the island is one restaurant, a large hotel (Monhegan House), another smaller combination hotel and rooming house (the Trailing Yew), and three or four private homes that periodically take in paying guests. Only one of the smaller private houses "takes in guests" in the winter; the other tourist facilities are closed.

General Infrastructure

The only way to reach Monhegan is by boat. The ferry, called "Laura B," runs between Port Clyde and Monhegan twice a day in the summer, and three times a week in the winter. The 70 foot ferry boat is privately owned by a Port Clyde man, and carries only passengers and cargo. There is seasonal service from Boothbay via the "Balmy Days," and another small boat from New Harbor makes occasional trips. Both cater primarily to the tourist trade.

There is no airfield on Monhegan. Only a few automobiles and pick-up trucks run on the gravel roads around the settled area. Monhegan is one of the few places in the United States where most people walk most of the time.

There is one general store where many of the island residents do a good deal of their food shopping and obtain their heating oil. The store, however, sells little in the way of clothing or hardware. Monhegan residents take several trips a year to mainland cities and towns (e.g. Rockland, Bangor, Portland, Boothbay) to obtain professional services and go on shopping expeditions.

There are no beaches or comparable tourist attractions or services on Monhegan. People come to the island to enjoy the natural beauty of this unspoiled offshore location and to have a chance to participate in an unusual way of life. Monhegan, for its part, does its best to maintain its rough, rustic charm. Virtually all the buildings are built of weather-beaten cedar shingles, and there are few cars and mechanical gadgets. Until the mid-1970's the community did not have an electric power generating plant.

Monhegan has a one room schoolhouse and one teacher. Island residents go to the mainland for high school.

Port Infrastructure

All of the boats at Monhegan are moored in the small stretch of water between Monhegan and the small island of Manana about one-eighth of a mile west/northwest of Monhegan. The so-called "harbor" is thus open at both ends. It provides reasonable protection for boats, except when the wind blows from the southwest. When the wind blows from that quarter, relatively large waves enter the harbor.

There is only one large wharf on Monhegan--the town wharf--used by the ferry and fishermen alike. Many of the Monhegan fishermen use a small beach near the town wharf as a place to keep their skiffs. Near this beach is a row of "fish houses" used for bait storage.

The U. S. Coast Guard maintains a small manned lighthouse on Manana Island. The crew does nothing but run the lighthouse and horn. No lifeboats or search and rescue boats are attached to the Manana Light Station.

Types of Fishing

Lobster fishing is the mainstay of the Monhegan economy. After the lobstering season is finished in June, three fishermen go gillnetting and herring fishing.

Lobster

1. Number of Boats, People, and Fishing Areas

There are 13 inboard-powered boats on Monhegan. Virtually all of these are operated by two man crews and do most of their fishing within two miles of the island. The two mile fishing zone around the island is strictly maintained by the fishermen themselves during the six month fishing season. No one is permitted to fish in this zone (islander or mainlander) from June to January.

2. Marketing

Virtually all of the lobsters caught by Monhegan fishermen are sold to Art's Lobsters in Tenants Harbor. The owner of this dealership maintains a lobster smack (50 foot) which he uses to bring bait to the island fishermen and transport the lobsters he buys there. During the fishing season, the fishermen store their catches in lobster cars moored in the harbor, and sell to Art's about every two weeks. Periodically, a few island fishermen sell some lobsters to dealers in Boothbay, Port Clyde or New Harbor.

3. Processing

None.

Minor Fisheries

In the summer and early fall two lobster fishermen use their boats (35 foot range) for gillnetting. They generally fish in the waters 10 miles south and east of Monhegan; the fish are sold to Boothbay Fish and Cold Storage.

In the summer, one Monhegan fisherman uses his boat (about 45 feet) for purse seining herring. Usually these fish are sold to North Atlantic Fisheries in Boothbay Harbor or sold for bait.

PLEASANT POINT

Physical Setting and Population

Pleasant Point is a very small hamlet in the town of Cushing, on the end of a long peninsula reaching out into Muscongus Bay. The town of Cushing itself has no real center or population focus at all. Most of the 795 people in the township live in widely-scattered locations along the few tarred highways. Pleasant Point itself has about 15 houses clustered along the harbor. By highway, Pleasant Point is about 12 miles south of Thomaston.

Major Industries and Economic Pursuits

No industrial plants of any kind are located in Pleasant Point or the town of Cushing. Most of the male residents are either fishermen or else work in the Thomaston-Rockland area. Several work in the "cement plant" in Thomaston. In recent years, there has been an influx of retirees into the area, so that there are a substantial number of people who do not work. In Cushing there are a large number of "cottages" belonging to people who live in them or rent them for the summer season. There is only one restaurant catering to transient tourists, and no motels.

General Infrastructure

Pleasant Point may be reached only by automobile on a small town road from Thomaston. There are no stores in Pleasant Point, and only a couple of small general stores in the entire township of Cushing. All shopping facilities and services are located in Rockland. All residents of Pleasant Point make more than one trip to Rockland per week. In the town of Cushing there are no industrial or governmental installations of any kind.

There are a large number of "summer people" who maintain cottages and old farms in Cushing, but there are no clusters of camps or cottage colonies as there are along the open ocean beaches or on the headlands and capes. The whole township has the aura of a sparsely-populated, rural area.

Port Infrastructure

There are two anchorages used by fishermen from Pleasant Point and nearby areas of Cushing. The first is in Pleasant Point gut, a narrow protected stretch of water between the mainland and Gay Island. There are 12 boats moored regularly in the gut. The only substantial dock is the one owned by the Lusty Lobster Company.

Another six or seven boats are moored in Maple Juice Cove, about one and a half miles up the St. George River. The owners of these boats generally use a wharf which they have rented.

Types of Fishing

Lobster

1. Number of Boats, People, and Fishing Areas

There are 19 inboard-powered lobster boats that regularly fish from the two anchorages at Pleasant Point or Maple Juice Cove. All of the 12 boats from Pleasant Point fish for lobsters all or most of the year. These boats are operated by full-time fishermen, who fish in their own area around the island chain extending from Caldwell Island and McGee Island to Allen's Island and Burnt Island. Two or three of the fishermen from Maple Juice Cove fish "outside," in the area exploited by fishermen from Pleasant Point. The rest fish only in the St. George River itself, and confine their fishing to the warm months of the year. In the summer, there are approximately nine skiff fishermen who also fish in the St. George River.

2. Marketing

Most of the 19 fishermen from Pleasant Point sell their catch to the Lusty Lobster Company, which maintains a buying station in Pleasant Point. A few sell to Jack Woods, at Maple Juice Cove, who purchased his business from John Olsen in about 1977. Both of these dealerships sell gas and bait.

Some of the fishermen from Maple Juice Cove who operate from their own dock also obtain their own bait.

Seven of the fishermen from Pleasant Point and Maple Juice Cove regularly sell their catch to dealers in Port Clyde and obtain their bait and gas there as well.

3. Processing

No lobsters are processed in Pleasant Point.

Minor Fisheries

Karl Crute operates a small clam dealership in Cushing. Some of the clams he buys come from the waters of the St. George River or the Friendship River, but most of the diggers come from Friendship or other towns. Only 4 or 5 Pleasant Point people earn their living clamming.

In past years, a large number of crabs could be caught in the St. George River; in recent years, there have been very few. Only two to three women regularly pick crabs in the township. Unlike Damariscotta River to the west, there are very few crabs in the St. George River and no sizeable crabbing operations.

In the late 1960's and early 1970's, two or three fishermen from Pleasant Point went shrimping in the winters on a regular basis. In 1979, all of the men from Pleasant Point earned most of their income from lobstering. Two or three are beginning to experiment with dragging in the spring of the year. In the future, if spring lobstering does not improve, several Pleasant Point lobstermen are planning to drag for groundfish in the spring on a regular basis. The fish caught by all fishermen from Cushing are sold in Port Clyde.

FRIENDSHIP

Physical Setting and Population

Friendship is a community of some 834 people at the head of Muscongus Bay. It is located on a peninsula between the St. George River and the Medomak River, about 12 miles southeast of Waldoboro. A very high proportion of the population lives in Friendship itself, and along the road to Martin's Point, about two miles away.

Major Industries and Economic Pursuits

Fishing is clearly the most important industry in the Friendship area. There are no industrial plants located in town, save for those owned by the three small companies that make lobster traps. A small number of local residents work in the plants at Waldoboro. Since there are a large number of summer cottages in the area, a number of people are employed in the construction trades.

General Infrastructure

Friendship can be reached only by automobile. One highway (Route 220) links Friendship with Waldoboro, and another goes through Cushing to Thomaston to the northeast. There are only three small convenience stores in Friendship, two of which have gas pumps. There are no other commercial establishments to speak of, save for a plumbing shop which also carries some hardware. Virtually everyone in town does almost all shopping in either Waldoboro or Rockland. There are no notable public or private installations in the community.

Port Infrastructure

There are four anchorages in the town of Friendship. Most of the boats are moored in Friendship Harbor itself. This harbor is over a mile long, and has space for several hundred moorings. The anchorage is protected by Jamison Point to the west and Friendship Long Island to the south and east. There are several wharfs clustered along a half mile of Jamison Point. Most belong to lobster buyers. There is, however, a town wharf, about 200 feet long, near the center of the harbor complex. A smaller number of boats are moored at Hatchett Cove, in the Friendship River, and in one of the coves in the Medomak River, near Hungry Island. There are no large wharfs or docks at any minor anchorages save for the one owned by Wendell Reed, a lobster dealer at Hatchett Cove.

Types of Fishing

Friendship is one of the most important lobster fishing harbors in the state of Maine. For all practical purposes, nothing but lobstering is done from Friendship.

Lobster

1. Number of Boats, People, and Fishing Areas

There are an estimated 112 lobstering boats fishing from the four anchorages in Friendship. About 75 are moored in Friendship Harbor itself; another 15 boats at Hatchett Cove; some 12 boats in the Friendship River; and about 6 to 8 boats at points in the Medomak River. About 35 of these boats are skiffs, which operate only in the summer months. The rest are typical inboard-powered lobster boats. Most of the 75 or 80 men with inboard boats do nothing but fish for lobsters. However, a large number of them do not go fishing during the coldest winter months.

2. Marketing

Virtually all of the lobsters caught by Friendship fishermen are sold to one of the five local buyers:

- (a) Wallace Shellfish Company. This company owns a large dock at Friendship Harbor. It buys lobsters from some 35 lobstermen, and supplies them with bait and gas.
- (b) Coastal Fisheries. This firm's wharf is also located at Friendship Harbor. Some 30 lobstermen work from this dock. The company also supplies both bait and fuel.
- (c) Wendell Reed. This firm owns a wharf on Martin's Point, and regularly buys lobsters from about 15 fishermen. The firm supplies bait, but no fuel.
- (d) Simmons Wharf. About 35 fishermen regularly sell to this company and operate from its wharf. It supplies bait, but no fuel.
- (e) Roger Bramhill. This firm has just begun to buy lobsters at its wharf on the sparsely populated eastern side of Friendship Harbor.

There are also two large pounds in Friendship owned by a concern in Portland, Maine.

3. Processing

None.

Minor Fisheries

In the recent past, several small-scale fishermen from Friendship harvested mussels. In the past two years, the mussel beds have been over-exploited, so that only three to five fishermen now are musseling.

One Friendship family owns two fiberglass boats and an airplane. The larger boat, about 50 feet long, is used for dragging in the winter and spring. The two boats and plane are used to purse seine for herring and pogies during the summer and fall. The groundfish are sold to a dealer in Port Clyde; the herring to plants in Rockland and Boothbay Harbor; and the pogies to a bait dealer.

Approximately 12 men dig clams. Only one of these men is a full-time clam digger; the rest are part-time.

Important Institutions Related to Fishing

Friendship Trap Company

This company manufactures aluminized and vinyl-covered wire lobster traps at its plant on the Cushing Road outside Friendship village. It employs between nine and eleven people. The company delivers its traps to customers in Maine, Massachusetts, and Rhode Island.

Harborside Trap Company

This company manufactures wire traps in its shop located in the middle of Friendship village. Three to four people are employed there.

Thomas Thibodeau

This concern, located in the middle of Friendship village, manufactures wire lobster traps. The company regularly employs three to four people.

Lash Brothers Boatyard

This company is housed in a set of ancient buildings on Martin's Point. It employs some six to eight people in the construction of yachts and fishing boats. In the past two years, the firm has built several small draggers.

WALDOBORO

Physical Setting and Population

The town of Waldoboro is located on the Medomak River, about nine miles north of the point where the river broadens out to become Muscongus Bay. Waldoboro is located on U. S. 1, about 18 miles west of the city of Rockland. In 1970, the town had a population of 3146, concentrated in the only settlement in the township--Waldoboro itself; it is the largest town in Lincoln County.

Major Industries and Economic Pursuits

Light industry and fishing are the major occupations in Waldoboro. The Sylvania Electric Company has a small plant on the Friendship Road employing 300 people in the manufacture of lighting filaments. The Patrician Button Company occupies an older four story wooden structure near the center of town, where its 50 employees manufacture plastic buttons. Pilot Instrument Corporation has a small plant on the Friendship Road where its 25 employees manufacture UHF radios. A large number of people are employed in the fishing industry--primarily clamming.

General Infrastructure

Waldoboro is served by U. S. 1 and Maine routes 32 and 220. No other transportation facilities exist. The town has a small downtown section two blocks long, composed of brick buildings built in the 19th century. Until recently this shopping section was quite run-down, but recently some of the buildings have been renovated and turned into gift shops, restaurants, etc. There is a newly-formed local Chamber of Commerce which hopes to promote further development of the town businesses. Much of the commercial activity in town is concentrated in stores, gas stations, shops, etc. which have been constructed along the Route 1 bypass about one-half mile north of the center of town. People from Friendship and other surrounding towns do some of their shopping in Waldoboro, but everyone from the entire area--including from Waldoboro itself--obtain many supplies and most of their professional services in Rockland and to a lesser degree Augusta.

Port Infrastructure

The Medomak River is only 100 to 200 feet wide in the vicinity of Waldoboro. The community looks like many other small communities in the interior of Maine with a little river running through it. There are no good anchorages and no port facilities to speak of. On the west bank of the Medomak River, near the center of town, there is a small town landing with a gravel launching ramp and parking space for perhaps 30 automobiles. It is this ramp which is used by a good many clambers when they are going to dig in the headwaters of Muscongus Bay or the Medomak River itself. A few boats are moored in the river near the center of town, but several others are kept in the river or various coves off Dutch Neck or Gross Neck, a few miles further south. A few hundred yards north of the center of town, there is a dam on the river, where the town operates a small handnet alewife fishery in the spring.

Types of Fishing

Clamming is the most important type of fishing done by people from Waldoboro, followed by lobstering. There are no other types of fishing done.

Clams

1. Number of People and Fishing Areas

There are approximately 120 men from Waldoboro who earn most or all of their income digging clams. In past years, clambers from Waldoboro exploited only the flats in the Medomak River and Muscongus Bay. In recent years, however, they have ranged further afield. At present,

a very high percentage of the catch now comes from the flats on the Penobscot Bay islands. Usually, the diggers transport their outboard-powered skiffs on small trailers to the shore of Penobscot Bay, go to the islands by boat, dig one or two tides, and return the same day. Other men go to the islands by pickup truck on the auto ferries.

2. Marketing

Most of the clams dug by local men are sold to one of the four local clam dealers.

3. Processing

A very high proportion of the clams purchased by local dealers are shucked locally and then sold to restaurants, etc. to be made into fried clams.

Lobster

1. Number of Boats, People, and Fishing Areas

Approximately 18 local fishermen go lobstering on a regular basis. About half of these have small inboard-powered boats; the others have outboard-powered skiffs. Most of these men exploit only the waters of the Medomak River and Muscongus Bay north of the hamlet of Medomak. The fishing season lasts from May to October. A high proportion of these fishermen have other jobs, usually in one of the local plants, so that only three or four local men can be considered full-time lobster fishermen.

2. Marketing

There is no lobster dealer in Waldoboro. Fishermen obtain their own bait and gas and market their lobsters independently to dealers in other towns. Wallace Shellfish Company in Friendship buys a great many lobsters caught by Waldoboro fishermen, along with one or two other dealers in Friendship, and the Lusty Lobster Company in Bremen.

3. Processing

None.

Important Institutions Related to Fishing

Northeast Marine Products

This company makes wire lobster traps in its small plant located at the junction of U. S. 1 and Maine Route 220. The plant employs seven people, and markets its traps throughout Maine.

Small Seafood Dealers

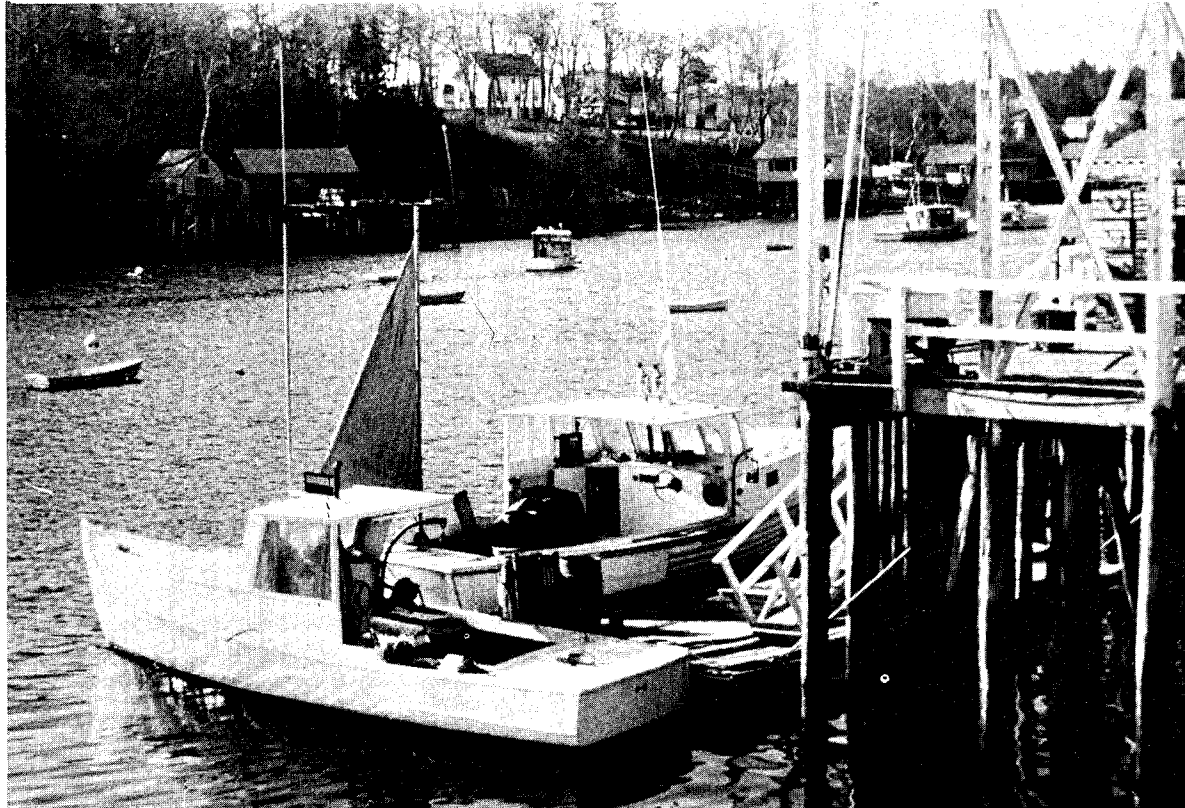
There are five men in the Waldoboro area who sell small amounts of seafood. Most operate their business out of their own homes, and have one small truck. The primary product these men market is clams.

Thomas Winchenback operates a buying station for Paul Bailey of Pine Point. This firm only sells clams in the shell.

Clayton Smith has a small shucking house on Route 220, just north of Waldoboro, which employs between three and five people. The clams are purchased from local diggers and buyers in the Mil-bridge area. They are then sold to restaurants and retailed in South Paris and other locations in Maine where the firm's truck goes to "peddle" fish on a regular basis.

Ken Waltz employs 5 local women in his shucking operation in the basement of his home in Waldoboro. The clams are purchased from local diggers who exploit clams from Vinalhaven to Wiscasset.

John Murphy operates a small shucking house on Route 32, employing some five to nine people. He regularly sells to Willard and Daggett in Portland. Clams from this Portland firm are regularly transported to New York and other east coast cities by buyers from other locations in Maine.



DAMARISCOTTA AND NEWCASTLE

Physical Setting and Population

Damariscotta and Newcastle are located on the Damariscotta River about 15 miles above the mouth of the river. Damariscotta is on the east bank; Newcastle is across the bridge on the west bank. Damariscotta has a small land area. Most of its 1188 people live close to the center of town. Newcastle is far larger in area but only has a population of 1074. Most of its people live in houses scattered along rural back roads. Only a few hundred people live in the hamlet of Newcastle itself, near the Damariscotta bridge.

Major Industries and Economic Pursuits

There are no industrial plants located in either Damariscotta or Newcastle. These towns, particularly Damariscotta, are essentially service centers whose stores, shops, restaurants, and professional people serve both permanent residents and summer people from other towns in this part of Lincoln County. Many people in these two towns work in local service industries. Damariscotta and Newcastle are known as wealthy communities, and "nice places to live." In this sense, they are almost bedroom communities for people working in cities within a thirty mile radius or more (e.g. Brunswick, Bath, Augusta, and even Portland). The towns also have a very large population of retired people.

General Infrastructure

Damariscotta and Newcastle may be reached by U. S. 1. No other transportation facilities exist. The town of Damariscotta has a well-developed shopping district, built in the last century, with food stores, clothing stores, hardware stores, etc. It also has a growing regional hospital, while Newcastle is the site of one of the four high schools in Lincoln County. There are, however, no large public or private installations in either town.

Port Infrastructure

There are no anchorages where very large vessels can anchor. Small boats, however, generally are moored in the channel of the Damariscotta River just off the town float in Damariscotta, or close to the Riverside Boat Company, about one-half a mile south in Newcastle. The only landing places are at the town float or at the Riverside Boat Company dock. Neither set of docks is capable of handling boats much over 45 feet long and then only at high water. The Riverside Boat Company has a marine railway, repair service and storage facilities. This company, however, serves mainly pleasure boats.

Types of Fishing

Crab and Lobster

1. Number of Boats, People, and Fishing Areas

There are six small boats operating out of Damariscotta. Two of these are under 28 feet and have inboard engines; the other four are under 20 feet long and are powered by outboard engines. All of these boats operate only in the Damariscotta River and go no further than "the narrows," about eight miles from the town wharf. The boats are put in the water in April and pulled out again in November. From April to August, the primary catch is crabs; in the fall the value of lobsters is greater than the crab catch. In the winter, all the fishermen have other jobs (welding, shipyard, cutting wood, etc.).

2. Marketing

There is no lobster or crab dealer in Damariscotta or Newcastle. Each fisherman arranges to

have one, two, or three local women pick his crabs, and then sells them on his own to local restaurants or fish stores. In the last few years, three of the local fishermen have sold to Lusty Lobster, in Bremen, which also supplied their bait. Given this situation, several local fishermen spend as much time in their pickup trucks hunting for pickers, gas, bait, etc. as they do in their boats fishing.

3. Processing

Approximately 10 local women regularly pick crabs caught by fishermen operating in the Damariscotta River. They do not buy crabs, however. The crabs, from pot to market, are owned by the fishermen.

Marine Worms

1. Number of Boats, People, and Fishing Areas

Unlike nearby Wiscasset and Dresden where there are over 100 worm diggers, only 8 or 9 men from Newcastle and Damariscotta regularly dig marine worms. Some of the worms are dug in the headwaters of the Damariscotta, Sheepscoot, and Medomak Rivers, but increasingly, as local worm beds are depleted, local diggers range further afield. Some local diggers go as far as Belfast and Castine or to some of the Penobscot Bay islands to dig.

2. Marketing

Most of the local worm diggers sell their catch regularly to Maine Bait Company in Newcastle.

3. Processing

None.

Minor Fisheries

The towns of Newcastle and Nobleboro own an alewife trap in the small stream running between Damariscotta Lake and Great Salt Bay, in the hamlet of Damariscotta Mills. The alewives migrating upstream enter a chute and are lifted out by a large metal screen driven by an electric motor. They are then sold to local fishermen to be used as lobster bait. The alewife trap operates only during May and June during the alewife run, but in those few weeks it supplies a major part of the bait used by fishermen from several surrounding towns. The concession is leased out by the two towns involved to a private citizen who operates the trap and sells the bait. In recent years, the trap has produced several hundred bushels of bait a day, which sold in 1978 for \$4.50 per bushel.

Important Institutions Related to Fishing

Maine Bait Company

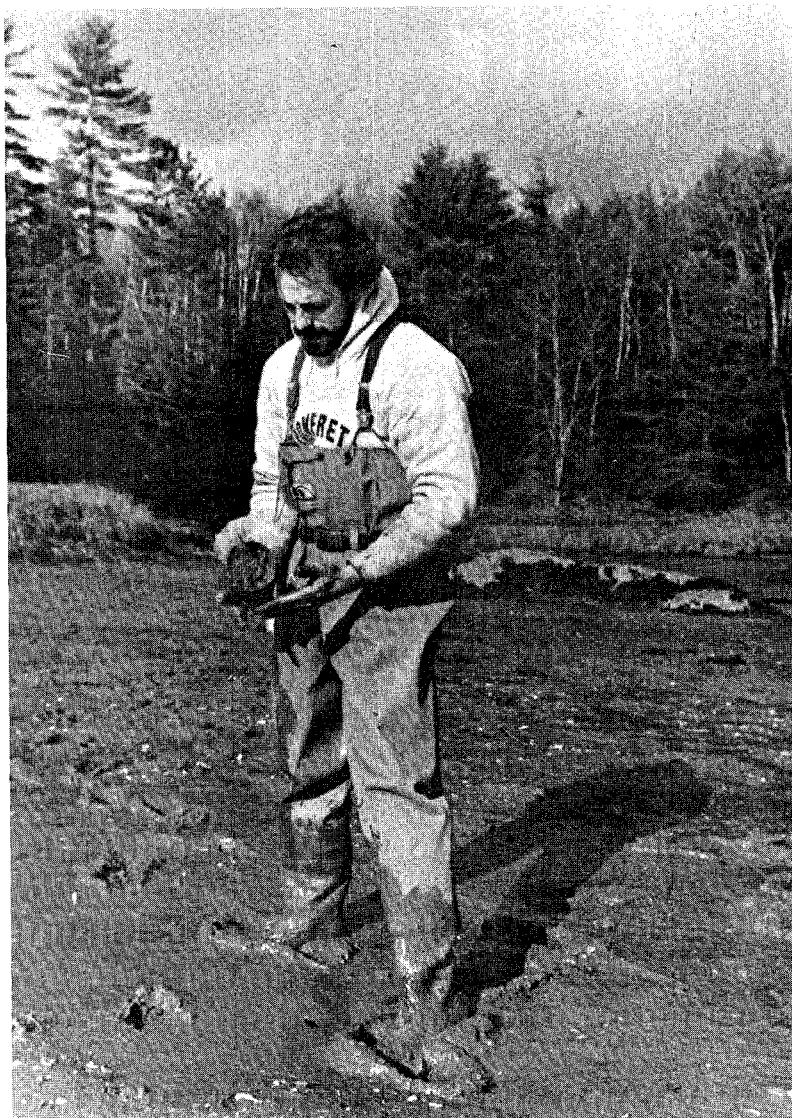
This company, one of the largest wholesale distributors of sand and blood worms in Maine, has two buying stations: one in Newcastle, on Academy Street, the other in Hancock. The business was started in 1946 by Mr. Ivan Flye. Ivan Flye runs the Newcastle operation; his brother operates a station in Hancock. Seven diggers regularly bring their sand worms to Maine Bait Company's station in Newcastle, along with 3 to 15 blood worm diggers. These diggers come not only from Damariscotta and Newcastle, but from surrounding towns as well, such as Wiscasset, Dresden, etc.

The worms from the Maine Bait Company are shipped to both east and west coast markets. The worms leave Newcastle either on the Greyhound bus or by private trucking firms. The worms destined for markets outside New England (e.g. West Coast, Carolinas, France, etc.) are taken to Logan Airport and loaded on planes there.

Aquaculture Operations

The Aquaculture Workshop has held classes, sold equipment, and has otherwise promoted aquaculture in Maine. At present, the Aquaculture workshop has its offices in the Stone Chimney office building, about 2 miles east of the downtown Damariscotta shopping district. The workshop is currently funded by small grants from the Community Development Corporation and the Presbyterian Women's Opportunity Giving Fund. The workshop is a forum where aquaculturists from all parts of Maine can get together to exchange ideas, etc.

There are four small aquaculture operations in the Damariscotta River in the town of Damariscotta itself. Of these, only Dodge Cove Marine Farm is currently producing large amounts of oysters for the commercial market.



BREMEN

Physical Setting and Population

Bremen is a small town on the west shore of Muscongus Bay, on the Pemaquid Peninsula. The town is at the head of the bay between Bristol and Waldoboro. In 1970, the entire population of the town was 454. Virtually all of the people live in the small hamlets of Medomak or Muscongus, along the shore of the bay, or scattered along Route 32, the major highway through town.

Major Industries and Economic Pursuits

Fishing is the most important industry in Bremen. There are no industrial plants or any large commercial establishments in town. Two or three people go to work in the Bath Iron Works every day, and a few others are employed in Waldoboro or other neighboring towns. In recent years many houses in town have been bought up by retirees.

General Infrastructure

Bremen may be reached only by car on Route 32. No other transportation facilities exist. There is one combination store and restaurant in Bremen, Hanleys, which is on Route 32. No other commercial establishments exist in town. People from Bremen do their shopping and obtain their services in either Waldoboro, Damariscotta, or one of the larger cities such as Rockland, Brunswick, Bath, or Augusta.

Port Infrastructure

There are three anchorages used by Bremen boats. A few pleasure boats anchor in Muscongus Harbor, a very tiny inlet on the upper reaches of Muscongus Bay with space for eight or ten moorings. Virtually all of the commercial fishing boats are moored near Zahn's lobster pounds off Hockomock Point, or near the Lusty Lobster Company wharf in the hamlet of Medomak, in the Hockomock Channel of the Medomak River. The wharfs at these two anchorages are capable of accommodating boats up to 50 or 60 feet, but nothing much larger. A few scattered boats are moored in the river at other places north of Medomak.

Types of Fishing

Lobstering and clamming are the two major types of fishing done by fishermen from Bremen.

Lobster and Crabs

1. Number of Boats, People, and Fishing Areas

About 23 lobster boats go fishing from Bremen in the middle of the winter. In the summer, there are approximately 55 fishermen. Approximately 15 to 18 of them fish from outboard-powered skiffs. In the summer, all of the Bremen fishermen stay in the upper reaches of Muscongus Bay. In the fall, winter, and spring, they fish in the outer areas of the bay--around the middle ground buoy and within three or four miles of Monhegan. Most of the boats used by Bremen fishermen are 30 to 35 feet long. There are, however, four large lobster boats operating from these harbors in the range of 38 to 42 feet.

2. Marketing

In the summer, about 35 fishermen sell their lobster catches to the Lusty Lobster Company. The other 20 sell regularly to B. T. Zahn, Inc. The crabs are sold to local women, who pick the meat in their homes.

3. Processing

No lobsters are processed in Bremen. Approximately six local women purchase crabs from fishermen, pick the meat out, and market it to local seafood stores, restaurants, etc.

Groundfish

1. Number of Boats, People, and Fishing Areas

In recent years, two very large lobster boats have regularly gone dragging in the spring. These boats are moored at New Harbor during the dragging season.

2. Marketing

Groundfish from these two Bremen boats are taken out over the New Harbor Lobstermen's Cooperative wharf and sold either to Stinson Packing Company plant in Rockland or are taken to the Boston Market by one of the truckers.

3. Processing

No fish are processed in Bremen save for a small amount which are filleted by the Lusty Lobster Company for its own retail operation. This fish, however, is not bought from local boats.

Clams

1. Number of People and Fishing Areas

An estimated 22 men from Bremen regularly dig clams. A very large proportion are dug in the upper waters of the Medomak River and the shores and islands of Muscongus Bay. However, in recent years, local diggers have increasingly gone to the Penobscot Bay islands for clams.

2. Marketing

Most of the clams dug by local diggers are sold either to the Lusty Lobster Company in Medomak or to one of the five clam dealers in nearby Waldoboro.

3. Processing

No clams are processed in Bremen.

Minor Fisheries

In the past year (1978-79), two local lobstermen have purchased a small purse seiner which they use in the summer to catch herring and poggies for lobster bait. They rarely go seining more than one or two times a week and stay in the confines of Muscongus Bay or adjacent areas.

Important Institutions Related to Fishing

Lusty Lobster Company

Although this company is involved in several aspects of the seafood business, most of its efforts are devoted to the lobster market. It operates two buying stations: one at its Medomak wharf, where it regularly buys from 20 to 35 lobster fishermen, the other a smaller operation at Pleasant Point, about 25 miles to the east by highway. Both these buying operations supply fishermen with gas, bait, wharfage, and necessary hardware and supplies. The company also supplies its fishermen with credit. The company has recently purchased the defunct Portland Lobster Cooperative Dock at Portland and has begun to purchase lobsters there too.

The company owns a pound on Southport Island, near Boothbay Harbor, and a freezing plant at Medomak to store bait for its fishermen. It has three large trucks which it uses to transport seafood. Most of the company's lobsters are sold on the wholesale market either in Boston or in New York. Large numbers of lobsters are also trucked to Logan Airport in Boston, and air freighted all over the United States.

The company operates a small retail operation in its office in Bremen, from which it sells lobsters, lobster meat, scallops, haddock, salt cod, etc.

Lusty Lobster also purchases clams.

B. T. Zahn, Inc.

Bernard Zahn began buying lobsters in Bremen in 1933. At present, he operates a lobster buying dock and two very large pounds, on Hockomock Point. He regularly buys lobsters from about 20 fishermen in the summer. He also supplies them with bait and gas. The firm regularly pounds lobsters about three times in the year: once in the spring for the July 4th market; once in August for the Labor Day market; and then in the early fall to sell during the months of January and February when the price of lobsters reaches an annual high. B. T. Zahn, Inc. owns no trucks. A great many of Zahn's lobsters are sold to Lusty Lobster, a mile away, or to the big Boston lobster dealers.

ROUND POND

Physical Setting and Population

Round Pond is one of the eight small hamlets in the town of Bristol, on the end of the Pemaquid Peninsula. The township as a whole has a permanent population of 1720 (1970 Census). Round Pond itself has approximately 300 residents whose houses are clustered around the harbor.

Major Industries and Economic Pursuits

Fishing is the major source of income in Round Pond. There is only one store devoted to the tourist trade, and no motels or hotels. The hamlet also has a relatively large retirement population, and several people who work in Waldoboro, Damariscotta, and other nearby towns.

General Infrastructure

Round Pond is served only by Route 32 and by small crossroads from Route 130. No other transportation facilities exist. There are two small general stores, one gas station, and one antique store. All of the residents from the hamlet obtain their services and do their shopping in Damariscotta or in the cities of Rockland, Brunswick, Bath, or Augusta.

Port Infrastructure

Round Pond has a harbor about one third of a mile long and perhaps one-fourth of a mile wide. There is a very narrow entrance to the harbor, which is protected by Louds Island, so that it is one of the most sheltered anchorages on the coast. The harbor is far from ideal. It is very shallow (three fathoms in the deepest place), and has no wharfs capable of accommodating vessels over 60 feet long. Moreover, the harbor freezes every winter due to the fresh water entering it from three large streams. As a result, Round Pond harbor is used only by small fishing boats and yachts in the warm months of the year. There are about 60 moorings in the harbor, which are equally divided between lobster boats and yachts and other pleasure boats. The only installations of note are the Padebco Boat Yard, which builds small yachts, and the two docks of lobster buyers.

Types of Fishing

Lobster

1. Number of Boats, People, and Fishing Areas

There are 29 lobster boats operating from Round Pond. Only 18 of those boats have inboard engines and are used by full-time fishermen. The rest are skiffs of one type or another and used by "part-timers." All of the fishermen from Round Pond fish between April and December 1st. By the end of November, virtually all the Round Pond boats have been pulled on the bank in anticipation of the harbor freezing. In recent years, two Round Pond fishermen have begun to moor their boats at New Harbor in the winter and continue fishing there.

2. Marketing

Virtually all the lobsters caught by the Round Pond fishermen are sold to the two local buyers. In the summer, a few fishermen sell directly to local restaurants or tourists. About 16 fishermen sell to Carroll Hanna and about 14 to Joe Gifford, the other buyer. These two buyers operate as most dealers do: they supply gas, bait, and wharfage to fishermen who are in turn obligated to sell most of their catch to the dealer. In the spring and fall of the year, both dealers sell most of their catch to wholesalers in other parts of Maine and Boston. In the summer, Carroll Hanna reduces the price on his lobsters and sells an enormous volume retail.

3. Processing

None.

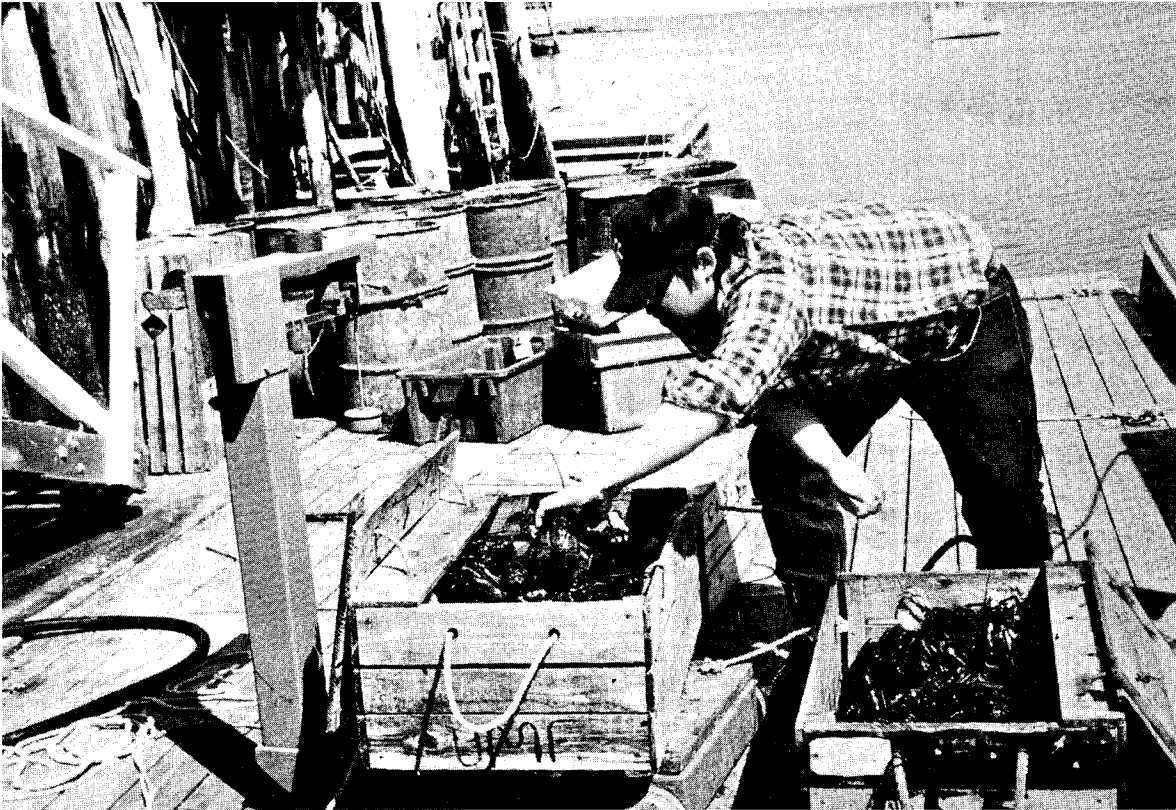
Minor Fisheries

Only 2 to 3 people from Round Pond dig clams on a part-time basis.

Important Institutions Related to Fishing

Long Island Oyster Farms, Inc.

This firm operates an oyster hatchery in its plant at Moxie Cove. It is a subsidiary of Inmont Corporation. The oysters are shipped to New York when they are about one fourth of an inch long, and are grown to market size at the firm's aquaculture sites on Long Island.



NEW HARBOR AND PEMAQUID HARBOR

Physical Setting and Population

New Harbor and Pemaquid Harbor are both in the town of Bristol, near the end of the Pemaquid peninsula. Bristol has no town center. There are eight hamlets: Bristol Mills, Pemaquid, New Harbor, Pemaquid Harbor, Pemaquid Beach, Pemaquid Point, Chamberlain, and Round Pond. New Harbor is the largest of the hamlets, with an estimated population of 450. In the summer the population of the town grows to approximately 5000 people with the influx of summer tourists. Three of these hamlets have harbors from which a lot of fishing is done. The most important are New Harbor and Pemaquid Harbor. The third, Round Pond, is not as important. In 1970, the population of the township as a whole was 1721.

New Harbor and Pemaquid Harbor are relatively close to each other. New Harbor is on the eastern side of the Pemaquid peninsula; Pemaquid Harbor is on the western side. There is, however, only a mile between the harbors across the peninsula. Many of the men who fish from Pemaquid Harbor live in New Harbor, and vice versa.

Major Industries and Economic Pursuits

Fishing and tourism are the most important industries in the area. There are no industrial plants of any kind in Bristol as a whole. Most of the so-called "tourists" own cottages and live semi-permanently in the town during the summer months. The whole shoreline of the town is literally lined with summer camps. There are a couple of small older hotels, two motels, several cottage colonies, and nine restaurants and lunch rooms in the entire township, but most of these are not open in the winter. There are no large modern hotels or motels catering to transient tourists. In recent years, a large number of retirees have moved into town. In 1970, 20.2% of the population was over 65. In 1980 the percentage will be significantly higher. Most people work in the town itself. A few commute to Bath, Rockland, etc.

General Infrastructure

The whole Pemaquid peninsula is a very rural area. There are only two small state highways serving the hamlets on the end of the peninsula, the most important being Route 130. There are no airfields or other forms of transportation. There is no shopping district or professional offices in the township of Bristol. The residents do all their shopping in Damariscotta or one of the cities within a 40 mile radius (Brunswick, Bath, Augusta, or Rockland). New Harbor has one general store, a gas station, two restaurants, three gift shops, and an inn. Pemaquid Beach, Pemaquid Harbor, and the other hamlets have far less. There are no governmental or industrial installations in the town.

Port Infrastructure

New Harbor has two anchorages: one in New Harbor itself, the other one-fourth of a mile away in Back Cove. In both coves combined there are moorings for an estimated 65 boats. Virtually all the moorings are occupied with fishing boats. There are only three or four pleasure craft in the harbor. The shores of New Harbor and Back Cove are lined with summer camps and small private docks. There is an unpaved launching strip at the head of New Harbor itself. The only installations of note are the Fisherman's Cooperative and Small Brothers Wharf and Restaurant on the north side of the harbor.

Pemaquid Harbor is located in the mouth of the Pemaquid River, and extends inland about two miles. Most of the fishing boats are moored in the mouth of the river in the summer, and just outside the harbor mouth behind Fish Point in the winter, since the inner harbor freezes in cold weather. There are only two installations of importance in Pemaquid Harbor: the Fisherman's Cooperative on the north side of the Harbor, and the Pemaquid Restoration (17th Century), on the south shore.

Types of Fishing

Lobster

1. Number of Boats, People, and Fishing Areas

There are 78 lobster boats fishing from these two harbors: 40 in New Harbor, and 38 in Pemaquid Harbor. Only a few of these boats carry sternmen, so that the numbers of men employed in this fishery is approximately the same as the number of boats. Approximately half of these boats operate at least nine months of the year. About 18 boats are outboard-powered skiffs and are operated only from May to October, at the most.

Lobster boats from New Harbor fish in Muscongus Bay, in the area circumscribed by Browns Head to the north, the Western Egg Rock to the east, and about three miles from Monhegan Island. The Pemaquid Harbor fishermen restrict their activities to John's Bay and the islands off Christmas Cove (e.g. White Island, Pumpkin, etc.). In other words, Pemaquid Harbor lobstermen and those from New Harbor have separate fishing areas.

2. Marketing

Most of the fishermen from Pemaquid Harbor and New Harbor sell their lobsters to the Fisherman's Cooperatives in their home harbors. Two New Harbor fishermen regularly sell to Small Brothers Wharf and Restaurant, and two others from Pemaquid Harbor own a small lobster pound at Riverside (in the John's River), and sell their own lobsters to wholesalers, etc. In the summer, a few fishermen sell part of their catch directly to restaurants or tourists.

3. Processing

None.

Groundfish

1. Number of Boats, People, and Fishing Areas

There are 11 groundfish boats in New Harbor and Pemaquid Harbor, which employ a total of 28 men regularly. The two largest boats (87 and 89 feet long) in the spring and summer stay close to New Harbor and use otter trawls for groundfish and periodically pair trawl for herring or poggies.

The other eight boats are draggers between 45 and 60 feet long. One is moored in Pemaquid Harbor, the other seven in New Harbor. Two of these eight boats also purse seine for herring. These boats generally fish in small tows off Pemaquid Point, at the mouth of Muscongus Bay, or in tows south and west of Monhegan Island. None of these boats is ever rigged for gillnetting.

2. Marketing

The cooperatives themselves do not handle groundfish. The fish are generally taken out at the New Harbor Cooperative or at Small Brothers dock and picked up by other dealers. In the recent past, Southern Maine Fisheries transported New Harbor fish to Boston to be sold by various brokers. In the past year, Stinson Canning Company is buying most of the New Harbor fish.

3. Processing

No groundfish are processed locally.

Herring

1. Number of Boats, People, and Fishing Areas

There are two large boats (87 and 89 feet) which fish for herring in the fall and winter.

Generally these boats pair trawl for herring, but they can use purse seines as well. In addition, one of the owners of the smaller purse seiners also stop seines for herring in New Harbor, Back Cove, and at Long Cove.

2. Marketing

The large pair trawlers regularly sell their catch to the Stinson Canning Company. One of the smaller boats sells to any canning company in the area where fish are caught.

3. Processing

No herring are processed in Pemaquid or New Harbor.

Minor Fisheries

Two local women buy large numbers of crabs, which they cook, pick and sell on their own. Another 10-12 people in the township of Bristol regularly dig clams.

Important Institutions Related to Fishing

New Harbor Fisherman's Cooperative

This cooperative was begun in 1973 and currently has 52 members. It owns a large dock on the north side of New Harbor, which has a building used for an office and summer restaurant, a storage place for salt, etc. The cooperative owns no pound or large storage tanks. Lobsters are kept in crates at the end of the wharf and sold either wholesale or retail as quickly as possible.

Pemaquid Harbor Fisherman's Cooperative

This cooperative, one of the oldest on the coast, was started in 1947. In 1977, it had 32 members, of which only 21 could be considered full-time fishermen. The cooperative owns no pound or restaurant. Lobsters are stored for short periods in crates or in tanks with about 5000 lbs. capacity. Most of the catch is sold wholesale, although in the summer a substantial number are sold retail to tourists who come to the dock.

North Country Woodproducts

This company produces wooden lobster traps in its plant on Route 32, between Chamberlain and Round Pond. The firm employs about 20 people, and makes 40 different styles of traps, which are sold throughout Maine and as far south as New Jersey.

SOUTH BRISTOL

Physical Setting and Population

South Bristol is at the end of the Pemaquid peninsula a few miles east of Boothbay Harbor, which is on an adjacent peninsula across the Damariscotta River. New Harbor and Pemaquid Harbor are a few miles west, but separated from South Bristol by John's Bay cutting into the tip of the peninsula.

The town of South Bristol has a population of 644 (U. S. Census 1970).

Major Industries and Economic Pursuits

South Bristol has many vacation and retirement homes. It does not have a heavily developed service infrastructure catering to the tourist trade, although it does have restaurants, small stores, and guest houses oriented toward it.

The TRACOR Corporation runs a small facility where they test submarine sounding gear for the U. S. Navy. This small plant and the Gamage Shipyard are the only industrial employers in town.

Fishing is an economic pursuit of significant proportions. The town also has two boat yards and a small marine consulting firm plus two firms involved in mussel and oyster aquaculture.

General Infrastructure

South Bristol is served by Route 129, and is also accessible by water. The modest commercial center of the town is at the community of South Bristol, located along a narrow channel between a small island and the tip of the peninsula. A small swing bridge connects the island to the rest of the peninsula. The island is an area where summer homes are concentrated. Several small stores, some of them seasonal, are located in the area.

The Ira C. Darling Center at the University of Maine has its facilities by the Damariscotta River a few miles north of the hamlet of South Bristol.

Major shopping areas for the region are Damariscotta at the north of the peninsula and the Bath and Brunswick areas. Rockland and Augusta also attract some shopping interest.

Port Infrastructure

South Bristol has two primary moorage areas. One is at Christmas Cove on the island at the tip of the peninsula. This is used almost exclusively by pleasure craft. The exceptions are one or two part-time fishermen who moor boats there during the summer. The other anchorage is in the channel between the island and the mainland. It is the focus of all fishing activity and most commercial activity in South Bristol. The channel is deep and of ample proportions to accommodate probably well over a hundred boats. The swing bridge connecting the island to the mainland must be moved to allow boats to exit on the Damariscotta River side of the peninsula.

Gamage's Boatyard, Maritec (the small marine consulting firm), the fishermen's cooperative, and all of the seafood dealers are located along the channel. A small boat repair and building concern (Peter McFarland) is situated on Christmas Cove. South Bristol also has two small private passenger ferry services. One goes to John's Island and the other to Inner Heron Island. These are seasonal operations.

In the Damariscotta River several miles above the harbor area are several aquaculture concerns.

Types of Fishing

Lobstering is South Bristol's primary fishery, with groundfishing a distant but growing second. Some scallops are also landed, but this is a minor part-time pursuit.

Lobster

1. Number of Boats, People, and Fishing Areas

South Bristol has about 60 lobster fishermen. Of these, 30 to 35 are full-time fishermen (25-30 lobster boats), 6 are part-time fishermen with specialized lobster boats, and the remainder are summer fishermen using skiffs. Most fishermen tend to operate alone, but a helper is not unusual and is especially common during the fall of the year.

2. Marketing

South Bristol has three buyers. The South Bristol Fishermen's Cooperative is by far the largest buyer and regularly purchases from 30 to 32 boats. Eugley's Lobster Wharf serves five fishermen and is primarily a family concern. Farrin's Store serves eight to ten fishermen during the summer but only four to five year round. Two other concerns (Annapolis Fish Company and Clark's Cove Fish Company) buy a few lobsters wholesale and resell them retail during the summer to tourists. The other concerns also vend some lobsters, but the bulk of their sales are to wholesale buyers.

3. Processing

No processing is done locally.

Groundfish

1. Number of Boats, People, and Fishing Areas

South Bristol has four full-time inshore otter trawlers (one is only taken out occasionally but is devoted solely to groundfishing) and eight boats that otter trawl during the spring only. These men fish for lobsters during the rest of the year. The full-time boats range from 42 feet to 46 feet, while those which fish only in the spring are from 32 feet to 38 feet in length.

2. Marketing

All groundfish are currently handled over a private wharf owned by Henry Jones. They are marketed through the Thompson-Nagle shipper and broker combination which also serves several other harbors in the area. Thompson attends to the shipping and Nagle, the broker in Boston, takes care of the marketing. Thompson operates from Cape Porpoise.

The Fishermen's Cooperative planned to handle groundfish beginning in the winter of 1978-79.

3. Processing

No processing is done locally.

Minor Fisheries

During the winter three to four lobster fishermen usually rig to dredge scallops. This is a minor activity for them. The scallops landed are sold by the individual bringing them in or to Farrin's Store which markets small quantities retail. Clark's Cove Fish Company handles some clams brought in from the surrounding area. There are few clam diggers in the area, but an estimated five or six individuals make major portions of their incomes digging clams. There are very few clamming areas in the immediate vicinity of South Bristol.

Distinctive and Unusual Characteristics of the Harbor

South Bristol is a very small town. Nevertheless, it is the site of a large boat building firm--Harvey Gamage Boat Yard--and the focal point for aquaculture operations in Maine. Most of the aquaculture operations are undoubtedly stimulated by the presence of the Ira C. Darling Center of the University of Maine, whose staff did some pioneering work in aquaculture in recent years.

Important Institutions Related to Fishing

Ira C. Darling Center

This facility houses the Oceanography Department of the University of Maine. The Center has eight faculty and some 22 graduate students, and grants both M.A. and Ph.D. degrees. The Center's research activities focus on studies of estuaries rather than on blue water oceanography. The Center's staff has done some research on worms, fin fish, and other commercial stocks, but its emphasis is on basic research. It also has done extensive work in oyster and mussel aquaculture.

Harvey Gamage Shipyard

This firm is one of the largest ship building companies in the state. It employs approximately 20 people on a year round basis, and builds yachts and fishing boats of wood and steel up to 120 feet long.

Oyster and Mussel Aquaculture Operations

A number of small aquaculture operations are located in the Damariscotta River. Several of these are located in South Bristol itself. Maine Mooring Oyster Company and Maritec Corporation are growing oysters, while Marine Bioservices runs a small oyster hatchery on High Island. Abandoned Farms, Inc. concentrates completely on mussel aquaculture.

South Bristol Fishermen's Cooperative

This cooperative was formed in 1975 and maintains a dock and other facilities on the north shore of "The Gut" at Christmas Cove. The cooperative has a full-time manager and some 29 members. The cooperative buys lobsters. In the winter, when some of the co-op members go groundfishing, the cooperative dock is used to handle groundfish. These fish are not purchased by the co-op, but rather are shipped to Boston and other markets by a trucking firm, "Denise Dee, Inc." from Cape Porpoise.

WISCASSET

Physical Setting and Population

Wiscasset, the county seat of Lincoln County, is located on the west side of the Sheepscot River, about 16 miles upstream from the river's mouth. In 1970, the town had a population of 2247. Very little fishing is done in Wiscasset. The town, however, is the center of the marine worm industry in Maine.

Major Industries and Economic Pursuits

Wiscasset bills itself as the prettiest town in Maine, and as the name suggests, tourism plays some role in the community's economy. In the central part of Wiscasset, and across the bridge spanning the Sheepscot, there are some six restaurants, an inn, several antique and gift shops, and two art galleries. However, far more people from Wiscasset are employed in heavy industry. The Central Maine Power Company's Mason Station, an oil-fired electric generating plant, is located about a mile south of the center of Wiscasset, on the west bank of the Sheepscot. Nearby is the Maine Yankee Plant, a nuclear-powered generating plant, also owned by Central Maine Power Company. Both of these plants together employ about 90 people. An estimated 250 people more are employed at the Bath Iron Works, about 11 miles to the westward. Wiscasset also has a growing number of retirees.

General Infrastructure

Highway U. S. 1 goes through Wiscasset, and the town is served by a Central Maine Railroad line. The shopping section of town is only two blocks long, and aside from a branch office of a bank, two hardware stores, a food store, a clothing store, and a drug store, it is dominated by restaurants, galleries, and shops catering to the tourist trade. Most of the houses in the central part of Wiscasset itself were built in the 18th and 19th century and are well-maintained. Some of the houses on outlying roads are far more modern. There are no large industrial installations in town save for the two power plants owned by Central Maine Power Company.

Port Infrastructure

The town of Wiscasset maintains a dock and launching facility on the waterfront which has a paved parking lot for 50 cars. The Wiscasset Yacht Club has a clubhouse and dock, next to the town float, which may be used by members only. The anchorage is in the river, near the Yacht Club and town dock. Most of the 39 moorings are occupied by pleasure boats in the summer, although there are a few scattered lobster boats among them. There is no marina in Wiscasset. There is also no maritime activity north of the U. S. 1 bridge since the river on the north side of town freezes periodically in the winter.

The Central Maine Power Company maintains a large pier on Birch Point, about one-half mile from the center of town. This pier is used to unload the oil tankers bringing fuel for the Mason Station Power Plant.

Types of Fishing

The marine worm business is the most important type of maritime activity done in the Wiscasset area. There are a few part-time lobster fishermen. In the recent past, one dragger was moored at Wiscasset, although it was frequently operating outside the Sheepscot Bay area. They also used to drag for seaweed in the Sheepscot River. At present, no draggers or "mossers" keep boats in Wiscasset. A few men from the town are commercial groundfishermen or lobster fishermen, but keep their boats in harbors nearer to open ocean.

Lobster

1. Number of Boats, People, and Fishing Areas

There are no full-time lobster fishermen who have boats in Wiscasset. In the warm months, six local men go lobster fishing on a part-time basis from outboard-powered skiffs.

2. Marketing

There is no lobster dealer in Wiscasset. Fishermen sell their catches either to local restaurants, or to one of three fish markets in Boothbay, Bath, or Edgecomb. One regularly sells his catch to the Boothbay Regional Lobstermen, Inc.

3. Processing

None.

Marine Worms

1. Number of Boats, People, and Fishing Areas

There are an estimated 105 men and boys from Wiscasset itself who regularly dig marine worms for a living and another 50 from adjacent towns. Most of the digging occurs in the warm months of the year. In the cooler months, many of these men take jobs cutting pulpwood, and return to the flats as spring approaches. Virtually all of these men use small skiffs, powered by outboard motors. Only an estimated six or eight of these worm diggers have boats as large as 18 or 20 feet long.

In the past, most of the diggers exploited flats along the Damariscotta River, or the Sheepscot. But as these flats have become depleted in recent years, the Wiscasset diggers have had to range further away. Some go regularly to flats in Belfast and Islesboro to the east and to Harpswell and Back Bay, Portland.

2. Marketing

All of the marine worms dug are sold to one of the four local dealers: S. F. Hammond, S and P Bait Company, Stanley Fairservice, or Randy Wanser. Some local men take their worms to Maine Bait Company in nearby Newcastle, or to a dealer in Boothbay.

Important Institutions Related to Fishing

S.F. Hammond

This marine worm bait company is located in the basement of the home of the company's owner. This company has three employees, and buys worms from approximately 40 worm diggers on a regular basis. The owner, Mr. Hammond, lets his diggers know each morning whether or not he has orders for worms. This firm deals mainly in bloodworms. Its primary market is California. The worms are packed in seaweed-filled cardboard boxes, trucked to Boston's Logan Airport and sent via Air Freight.

S and P Bait Company

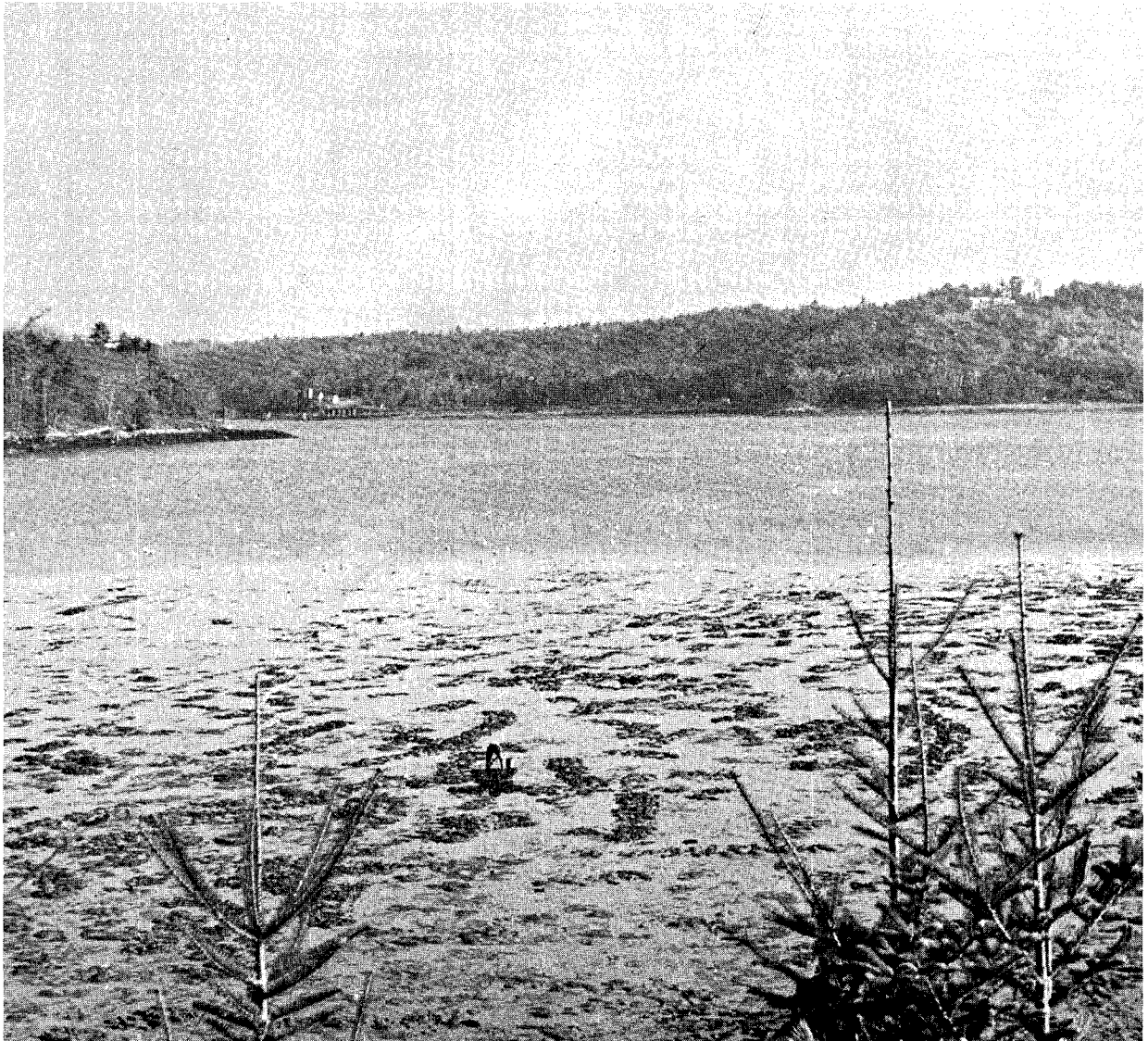
This company is located in the basement of a commercial building in central Wiscasset overlooking the Sheepscot River. This company has two employees, including the owner. Approximately 35 diggers sell their worms here. Since this company deals more in sandworms than bloodworms, its primary market is along the east coast, especially Massachusetts.

Stanley Fairservice

This company, located in Wiscasset, has two employees. Approximately 35 worm diggers regularly sell their catch to this company, which deals mainly in sandworms; its primary market is in New York and neighboring areas.

Randy Wanser

This company has only one employee, the owner, and he is only in the business on a part-time basis. This company deals mainly in sandworms, and sells primarily to dealers in New York, Virginia and other mid-Atlantic states.



BOOTHBAY

Physical Setting and Population

The town of Boothbay contains all of the land on the southern part of the Boothbay peninsula save for that in the congested area of Boothbay Harbor itself, which has been an independently organized town since 1889. There are several widely dispersed hamlets in the township: Ocean Point, East Boothbay, and Boothbay Center. In addition, the township contains three islands in the Sheepscot River, Sawyer's, Hodgdon's, and Barters Islands. All three islands are sparsely settled, but occupied throughout the year and linked to the mainland by a series of short bridges. In 1970, the total population of the town was 1814. In summer, the annual influx of tourists increases the population markedly.

Major Industries and Economic Pursuits

There are no large industrial plants located in Boothbay. Tourism and shipbuilding are the dominant industries. Unlike nearby Boothbay Harbor, there are very few facilities in Boothbay serving transient tourists, save for one large motel and restaurant complex on Ocean Point and two other large restaurants, one at East Boothbay and the other at Ocean Point. There are, however, a good many miles of waterfront in Boothbay and the shores of the township are studded with hundreds of cottages, owned mainly by people from out of state. Given the high price of shorefront land in Boothbay, most of these "cottage" owners have incomes that are well above average.

All of the boat building shops are concentrated in East Boothbay, where they form an industrial cluster on the bank of the Damariscotta River. An indeterminate number of people work in other towns, particularly at the Bath Iron Works.

General Infrastructure

Boothbay can be reached by Route 27 which runs south from U. S. 1. No other transportation facilities exist. The town has no shopping facilities, commercial center, or professional offices, save for four small general stores located at East Boothbay, Boothbay Center, and at Trevett on Hodgdon's Island. The people of Boothbay do their shopping and obtain services at Boothbay Harbor, or in one of the nearby towns such as Bath.

Port Infrastructure

There are six minor scattered anchorages used by fishermen from Boothbay. Altogether they do not contain as many boats as Boothbay Harbor--the major focal point of fishing in the area. Seven or eight lobster boats are anchored at Back Narrows, about six miles up the Damariscotta River from Ocean Point. One or two boats are moored in the Damariscotta River at East Boothbay. Another six lobster boats are moored at the northern end of Linekin's Bay, and a few more are located on the other side of town at Trevett, off Hodgdon's Island. The largest anchorage in the town is at Little River, close to the end of Linekin Neck. While Little River Harbor is very small and difficult to enter in a blow, about 12 lobster boats are moored there along with one dragger. There are no substantial wharfs at any of these anchorages, save for the Mill Cove Lobster Pound wharf used by fishermen operating from Trevett, and the dealer's wharf at Little River, quaintly called the Lobster Shack.

Public facilities include: two launching ramps (one at Ocean Point, the other at Knickerkane Island); a float landing at the end of the Mill Cove Lobster Pound wharf; and two town docks--one small one at East Boothbay and another at Ocean Point; the latter has 25 moorings.

The most substantial marine facilities in the town are the docks and marine railways owned by the boat building companies in East Boothbay.

Types of Fishing

Most fishermen from Boothbay fish for lobsters. A few are involved in stop seine operations or fish for lobsters in the fall and groundfish in the spring.

Lobster

1. Number of Boats, People, and Fishing Areas

There are approximately 38 lobster boats located at the six anchorages used by Boothbay fishermen. Most of these boats are relatively small and are operated by only one person. There are approximately 35 part-time skiff fishermen.

2. Marketing

Many lobsters caught by Boothbay fishermen are sold to dealers in or near the place where their boats are anchored. About eight to ten men fishing around Trevett sell to Mill Cove Lobster Pound; many fishermen from Little River sell to the "Lobster Shack" in their home harbor; and some of the fishermen from Back Narrows sell regularly to dealers in South Bristol, which they have to pass regularly on their way in and out of the Damariscotta River. Some fishermen from all the harbors in Boothbay are members of the Boothbay Regional Lobstermen, Inc. and still sell all or part of their catches to this former cooperative (which is now technically a corporation); this is in Boothbay Harbor.

3. Processing

A relatively large amount of lobster is cooked, picked, and sold as lobster meat, particularly by Mill Cove Lobster Pound at Trevett.

Herring

1. Number of Boats, People, and Fishing Areas

There is one purse seiner (about 48 feet) which operates from East Boothbay. It has about a four man crew, and operates all over the central part of the Maine coast. Two sets of men from East Boothbay have stop seine operations. One has berths in Linekin's Bay; another in the Damariscotta River. One of these is the same man who owns the purse seiner. Crews of four to six are employed part-time on the stop seine. The number of dories used is unknown.

2. Marketing

The herring caught by Boothbay fishermen are sold either to North Atlantic Fisheries in Boothbay Harbor, to one of the Stinson plants or to Port Clyde Canning Company.

3. Processing

No local processing is done.

Marine Worms

1. Number of Boats, People, and Fishing Areas

Approximately 22 men from Boothbay regularly dig marine worms.

2. Marketing

Worms dug by Boothbay men are marketed either to Harlan Lewis, a dealer in Boothbay Center, or to one of the dealers in Wiscasset or Newcastle.

3. Processing

None.

Minor Fisheries

In Boothbay there are approximately 11 men who earn much of their income clamming. There are, however, no full-time clammers in the area.

Important Institutions Related to Fishing

There are several boat yards in East Boothbay which produce a high percentage of the fishing boats in Maine and New England. They are listed as follows:

Goudy and Stevens Boat Yard

This yard employs about 55 men including 10 welders, 8 carpenters, 6 painters, and a machine shop crew. The firm regularly has two 70 to 90 foot boats under construction, but has the capacity to build boats up to 145 feet long.

Edward Gamage, Inc.

This large yard employs between 35 and 40 men in the production of steel boats.

J. S. Alden

This yard employs about 15 men in the construction of yachts and fishing boats.

Coastal Plastics

This is a small shop employing about 12 men which produces fiberglass fishing boats and yachts.

J. Ervin Jones Boat Yard

A small yard producing wooden fishing boats.

George Hodgdon

A small yard employing three or four men building small wooden boats.

Paul Luke

A boat yard with 22 employees, producing yachts and small fishing boats. Many are made from aluminum.

Pounds

There are two lobster pounds in Boothbay, one owned by William Francis off Hodgdon's Island; and another in the Damariscotta River in East Boothbay operated by Alan Cheney of Bristol.

BOOTHBAY HARBOR

Physical Setting and Population

Boothbay Harbor is located on the southern tip of a long peninsula lying between the Sheepscot and Damariscotta Rivers. Originally, all of the southern part of the peninsula was included in the town of Boothbay. In 1889 Boothbay Harbor became a separate town. It includes only a few square miles surrounding the harbor itself and a few islands in the harbor. The remainder of the peninsula is still in the town of Boothbay. In 1970, the town of Boothbay Harbor had a permanent population of 2320 people. Since Boothbay Harbor is one of the most heavily touristed areas in Maine, the population expands to perhaps 7000 in July and August. It is also one of Maine's most important fishing ports.

Major Industries and Economic Pursuits

The whole economy of Boothbay Harbor revolves around tourism, fishing, and boat building. There are no industrial plants of any kind operating in Boothbay Harbor, or on the Boothbay Peninsula for that matter.

Boothbay has long been a mecca for summer tourists. Not only is every mile of shorefront lined with summer cottages, but the one mile section of shore along Boothbay Harbor itself is jammed with motels, restaurants, antique shops, and stores catering to transient summer visitors. On the shore of the harbor itself there are four very large motels which have restaurants, and another seven motels and large guesthouses in town.

On the eastern side of the harbor are five restaurants. The town also includes at least 16 major gift and antique shops, six clothing stores, two large food stores and three art galleries. Most of this commercial activity is located in a four block area on the west side of the harbor. During the summer months, this part of Boothbay Harbor is so congested with pedestrians that it is very difficult to drive through, much less find a parking space. The schooner, "Sherman Zwicker," is tied up at Boothbay Harbor, and has been turned into a floating museum. There are also three piers along the west side of the harbor which are used by various kinds of excursion boats. Two of these boats are used to take tourists fishing; two others transport people to Cabbage Island for clambakes; and the rest take scenic tours. Exactly why Boothbay Harbor is so attractive to tourists is somewhat of a puzzle. The town or region has no noteworthy natural or cultural attraction.

Fishing and boat building employ a large number of the residents of Boothbay Harbor. However, the largest single employer in the area is perhaps the State Department of Marine Resources, which operates the Bigelow Laboratory employing 73 people.

General Infrastructure

Boothbay Harbor can be reached only by automobile on state Route 27. No other transportation facilities exist. Boothbay Harbor's downtown area has a good many stores. However, many of these stores and shops are oriented solely to the tourist trade and are open only part of the year. Thus, most people in Boothbay Harbor do a great deal of shopping in Bath, Brunswick or other nearby towns. The town has a hospital and four doctors. A consolidated elementary school and high school serve pupils from Boothbay and Boothbay Harbor; the high school draws students also from the town of Southport.

Port Infrastructure

This town has an excellent, large, protected deep water harbor. The inner harbor provides anchorages for dozens of pleasure boats and fishing boats. The outer harbor, north of Tumbler Island, is used as an anchorage by very large vessels. There are also five boat yards, which build, repair, and store pleasure boats and two others which handle yachts and fishing boats. On the west shore of the harbor is a large town wharf, and three piers to handle the excursion

boats. There are two yacht clubs, the Down East Yacht Club which uses one of the excursion boat wharfs, and the Boothbay Harbor Yacht Club which has its own wharf, on West Harbor, about one mile from the inner harbor and commercial section of town. On McKown Point, about three miles from the center of town, is the U. S. Coast Guard Station and the State Department of Marine Resources Laboratory. All of the installations involved in commercial fishing are located on the east shore of the inner harbor. These will be covered in detail later.

Types of Fishing

Boothbay Harbor is one of the major fishing ports on the Maine coast. Boats from Boothbay Harbor go lobstering, dragging and after herring. There are also two large processing plants and a very active Fisherman's Cooperative.

Lobster

1. Number of Boats, People, and Fishing Areas

There are approximately 55 full-time lobster fishermen operating from Boothbay Harbor itself in the warm months of the year. Only 20 men go fishing all year long. About 35 of these boats are owned by "large" fishermen and have sternmen. In the summer, there are about 27 part-time fishermen operating from skiffs around the harbor mouth. Three lobster fishermen also operate stop seines, and another three switch to groundfishing in the spring and summer.

2. Marketing

Many of the full-time lobster fishermen in Boothbay Harbor and surrounding towns belong to the former local cooperative, and many lobsters are sold there. However, substantial numbers of lobsters are also sold to the Boothbay Fish and Cold Storage Company, and some 15 lobster fishermen regularly sell to Bean's Lobster Pound as well. Smaller numbers of lobsters are sold directly to local fish markets (e.g. the Broken Anchor and McClellan's) and in the summer some are sold directly to local restaurants.

3. Processing

An indeterminate amount of lobster is cooked, picked by local women, and sold as lobster meat in local fish markets. The vast majority of the lobsters caught, however, are sold live.

Groundfish

1. Number of Boats, People, and Fishing Areas

There are ten boats from Boothbay Harbor which regularly fish for groundfish all of the time or for a major part of the year. Two of these boats are large steel vessels about 75 feet long, which pair trawl for herring in the fall and winter, and go fishing in local waters for groundfish in the late spring and summer. Each of these large boats has a year round four man crew. Three other boats in the 50 to 55 foot range carry two man crews and concentrate on groundfish throughout the year. These boats usually fish within 30 miles of Boothbay Harbor, but periodically take long trips to other parts of the Gulf of Maine. In addition there are five smaller boats (40 to 45 feet), carrying two man crews, which fish within 20 miles. Two are gillnetters; the other three use otter trawls.

2. Marketing

Three of the largest boats in the fleet, including the two pair trawlers, land their fish at North Atlantic Fisheries, where it is either purchased by that firm, one of the local sea-food dealers, or else shipped to Boston to be sold via a broker. All the other seven boats regularly sell their catches to the Boothbay Fish and Cold Storage Company.

3. Processing

The Boothbay Fish and Cold Storage Company employs filleters and fillets a large proportion of the groundfish landed. Moreover, all the groundfish sold to the two local seafood dealers is filleted locally before it is sold through their retail outlets.

Herring

1. Number of Boats, People, and Fishing Areas

The two large 75 foot vessels pair trawl for herring throughout the fall and winter. One of the 50 foot draggers also purse seines for herring periodically. In addition, there are three stop seine operations in Boothbay Harbor. All of the stop seiners are also involved in lobstering or in lobstering and dragging. These stop seiners use their own lobster boats (32-37 foot range), and seine dories. One operation uses 12 dories; one only one; information is lacking on the third. Between four and eight people are employed on a part-time basis when herring come in.

2. Marketing

Most of the large herring caught by local fishermen are sold to Boothbay Fish and Cold Storage Company, North Atlantic Fisheries, or the Stinson plants in Rockland and Bath. When Boothbay boats are operating in distant waters, their fish are sold to factories in those areas or others who wish to buy them (e.g. Stinson Canning Company). Periodically, some of the smaller stop seiners will transport small quantities of fish directly to special markets in New York.

3. Processing

North Atlantic Fisheries machine-fillets the herring landed there. Boothbay Fish and Cold Storage Company freezes some sea herring.

Marine Worms

1. Number of People and Areas

Approximately 15 men from Boothbay Harbor dig marine worms on a regular basis. These men exploit the Damariscotta and Sheepscot River flats. They also go to other towns within a two hour's drive by automobile.

2. Marketing

Many of the local diggers sell their worms to Harlan Lewis, a worm dealer in Boothbay Center.

3. Processing

None.

Minor Fisheries

In July and August some 20 Boothbay harbor boats go fishing for tuna. About 10 boats are rigged as "sports fishermen;" the other 10 are commercial lobster boats or draggers whose owners make some money off the fish and a lot more off the tourists to whom the boats are rented on a daily basis. Most of the fishing occurs between Pemaquid Point and Seguin. All the smaller boats use a harpoon, but one 50 foot boat that usually drags for groundfish is rigged with longline gear. When fish are caught, they are usually entered in the annual Boothbay Tuna Tournament. Tuna are ordinarily brought to North Atlantic Fisheries Wharf. In recent years they have been put in large, ice-filled caskets and air-freighted to Japan. In recent years, Japanese fish buyers have become a common sight around the Boothbay Harbor wharfs during the tuna season.

Approximately seven men dig clams on a part-time basis.

Important Institutions Related to Fishing

Boothbay Fish and Cold Storage Company

This company, owned by some 78 stockholders from the Boothbay area, is involved in several different aspects of the fishing business in Boothbay Harbor. The company's plant is located on the east side of the harbor, next to North Atlantic Fisheries. In 1978, the freezer building was burned to the ground by an arsonist. Over the course of 1978-79, the company has been rebuilding. Several buildings have been completed; others are under construction. The entire complex is scheduled to be in operation in the summer of 1979. When it is completed, the plant will have: (1) a retail store (completed); (2) a dock (completed); (3) a lobster fishing shed (completed); (4) an unloading shed (completed); (5) a processing building behind the retail store (completed); (6) a freezing plant with 150,000 pounds capacity (completed); (7) a freezing and cold storage plant with 700,000 pounds capacity (not completed). The firm also plans to sell gas, diesel fuel, and fishermen's supplies.

In the fall of 1978, the firm only had four employees, but when it commences full operations in 1979, it plans to employ between 15 and 24 people. The firm handles some lobsters. However, the company will concentrate on supplying groundfish boats and buying their catches. The fish will be filleted and sold either retail or on the wholesale market in fresh and frozen form. The company also handles small amounts of herring.

North Atlantic Fisheries

This company handles both herring and groundfish. The herring are filleted with four automatic Baader machines, and then packed into 20 kilo boxes. At present, the herring are frozen in Portland, but in the future they will be frozen at the Boothbay Fish and Cold Storage plant next door. When the herring plant is in operation, it employs about 35 people in all aspects of the operation. The company also owns a herring carrier, "Captain Ed," which transports fish to the plant from ports in Maine, New Hampshire, and Massachusetts.

Groundfish from three boats are also unloaded at this company's wharf. These are sold either to local fish stores or are transported to markets in Boston and Gloucester.

Boothbay Regional Lobstermen, Incorporated

Until 1977, this organization used to be named the Boothbay Lobsterman's Cooperative. It still operates essentially as a cooperative, although the organization is now technically a corporation which makes it impossible for just anyone to join. The day-to-day operations of the company are handled by a full-time manager. The company supplies bait and gas to the fishermen who operate from its dock, whether they are technically owners or not.

The company also operates a small snack bar in the summer, selling shore dinners and short order foods which may be consumed on the company's wharf.

Lobster Pounds

There is one small pound in Boothbay Harbor, located on the west side of the harbor. It is owned by Richard Bean, and buys from 15 to 20 local fishermen on a regular basis. The firm buys Canadian lobsters as well.

U. S. Coast Guard Station

The U. S. Coast Guard operates a small lifeboat station on McKown Point. There are 23 men attached to the station who operate a 41 foot patrol boat, a 44 foot lifeboat and also have a

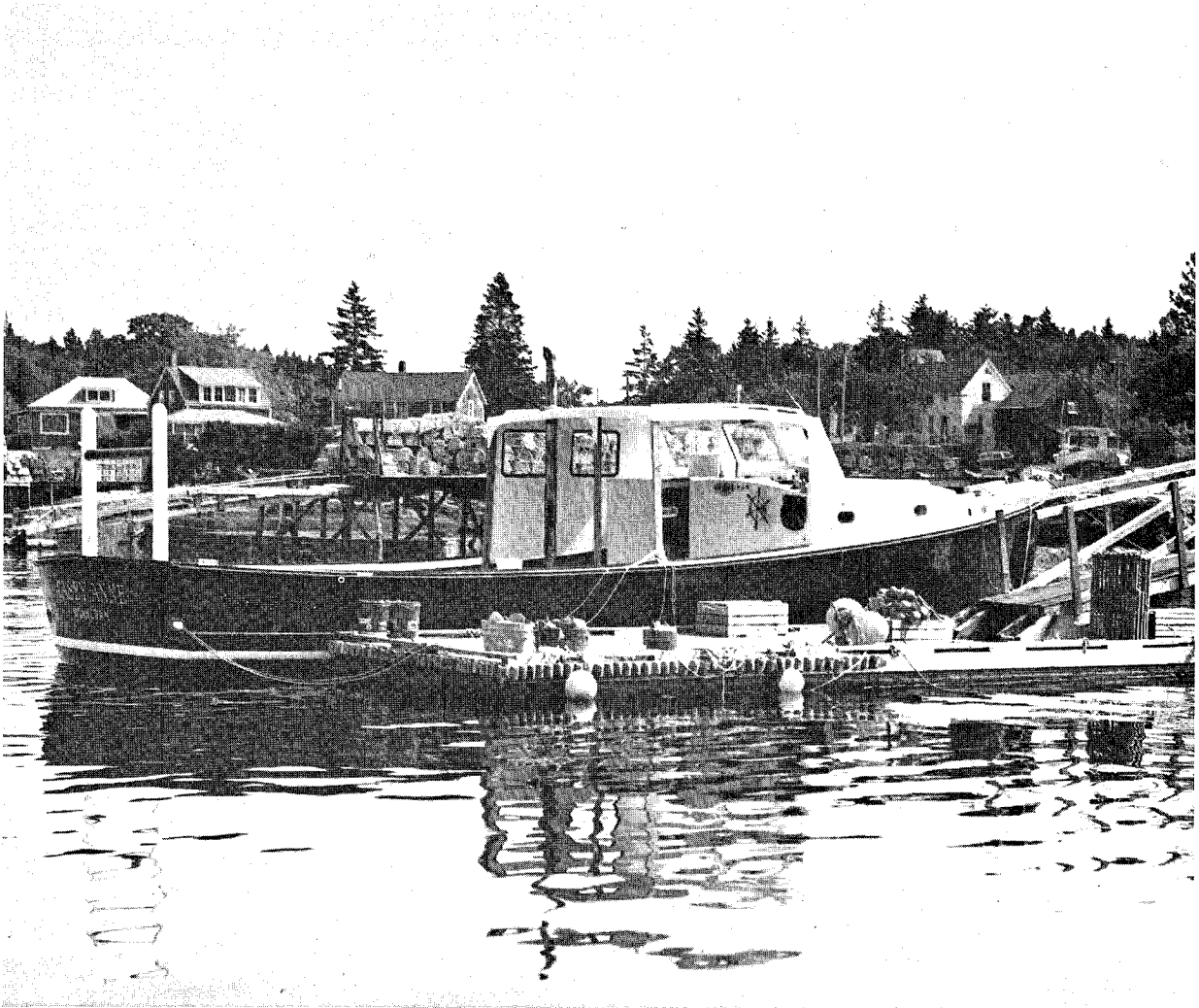
21 foot outboard-powered boat at their disposal. They handle calls between Cape Small and Marshall Point.

Bigelow Laboratory

This marine biological laboratory is operated by the Maine Department of Marine Resources. It has some 73 employees, including scientists and technicians who do all of the Department's research work on lobsters, clams, worms, herring and groundfish, and propose management regulations concerning those species. The laboratory has an aquarium open to the public. It also has two docks which are used by the Department's research and patrol vessels--the "Challenge" and the "Bigelow." Several fisheries wardens are also attached to this unit.

Sample Brothers

Sample Brothers operates a boat yard employing 12 to 15 men, which repairs yachts and fishing boats up to 90 feet long.



SOUTHPORT

Physical Setting and Population

Southport Island is the southernmost point of land on the Boothbay peninsula. The island is four and a quarter miles long and two miles wide at its widest point. It is connected to the town of Boothbay Harbor by a highway bridge spanning Townsend Gut. Although the town has an elementary school and fire station, there is no town center. The houses are located on the road which runs completely around the island, or on the shore front itself. Like all other towns in the Boothbay region, the population increases rapidly in the summer when there are an estimated 2200 people in town. There are 550 voters, so that the permanent year round population was approximately 725 in 1978.

Major Industries and Economic Pursuits

There are no industrial plants on Southport. There are, however, five large motels and hotels, including the Cape Newagan Inn and the large, modern Ocean Gate motel, one store, and a couple of boat yards catering to the pleasure boat trade. Lobster fishing is the economic mainstay of about 22 families. Several people in Southport work in Boothbay Harbor, and three or four have jobs in Bath and other nearby cities off the peninsula. Newco Diving Company, a small commercial diving company, maintains offices at Ebenecook harbor. This company specializes in salvage and wharf construction.

General Infrastructure

Southport is a rural area dedicated to the tourist trade and fishing. There are five motels and hotels; and the shore front of the island is ringed with summer cottages and an increasing number of permanently occupied homes. Some of these so-called "summer places" are very expensive.

The island's population obtains professional services and do their shopping in nearby Boothbay Harbor or one of the larger towns or cities within 40 miles--Augusta, Brunswick or Bath. The island can be reached by automobile or by boat.

Port Infrastructure

There are five anchorages on Southport: Townsend Gut, between the mainland and Southport; Cosy Harbor; Ebenecook Harbor; Christmas Cove, on the western side of the island; and Cape Newagan, on the southernmost tip of the island. Only three of these harbors have fishing boats throughout the year. There are 14 boats in Cosy Harbor, another four boats in Townsend Gut, and three boats in Christmas Cove. Six or eight local fishermen keep their boats at Cape Newagan in the summer, but this anchorage is far too exposed to use in the fall and winter. Only yachts presently use Ebenecook harbor, although fishing boats used to be moored there in the recent past. There are two lobster pounds on Southport: one located at Ebenecook Harbor, owned by Lusty Lobster of Bremen, the other at Pig Cove, on the east side of the island. Working fishermen land fish at three wharfs on Southport. There is a town wharf at Cape Newagan used only during the summer; a boat landing at Cosy Harbor; and Robinson's Wharf in Townsend Gut. There is another set of docks at Ebenecook Harbor owned by Brewer's Boat Yard and Maine Coast Yacht Sales, but these are not used by working fishermen.

Types of Fishing

Lobster

1. Number of Boats, People, and Fishing Areas

There are 22 full-time lobster fishermen on Southport Island, and approximately 25 part-time skiff fishermen who fish only in the summer. Two lobstermen also go stop seining for herring.

2. Marketing

All lobsters caught by Southport fishermen are sold either at Robinson's Wharf on the island or at Boothbay Regional Lobstermen, Inc. in Boothbay Harbor.

3. Processing

None.

Herring

1. Number of Boats, People, and Fishing Areas

Two local fishermen, who own lobster boats in the 33-38 foot range, also operate stop seines in the summer and fall. One of these boats is equipped with a powerblock. The coves these men tend are along the eastern side of the Sheepscot River. About four to six crewmen are employed when the herring are in. One man has about four seine dories, the other about two.

2. Marketing

Fish from these stop seine operations are sold to the Stinson Canning Company and processed at Bath. None are sold regularly to the two pound operators.

3. Processing

None.

Important Institutions Related to Fishing

Robinson's Wharf

This business is located on Townsend Gut near the bridge connecting Southport with the mainland. The company buys lobsters and clams from local fishermen all year, and in the summer it operates a restaurant specializing in seafood dinners. A few groundfish boats periodically use the wharf in the summer. Throughout the year, four tugboats, owned by Captain Elliot Winslow, are tied up here as well. These boats are used primarily to help oil tankers go up the Sheepscot River to the Mason Plant of Central Maine Power Company at Wiscasset.

FIVE ISLANDS AND BAY POINT

Physical Setting and Population

Five Islands and Bay Point are tiny hamlets located on Georgetown Island, which lies between the Kennebec and Sheepscot Rivers. The island is a separate township, and Five Islands and Bay Point are two of the three permanently occupied hamlets in the township of Georgetown; the other is named Georgetown. In 1978, the township as a whole had an estimated 850 permanent residents, and about 3200 in the summer when people flock to the island to live in the cottages that ring the shoreline. Five Islands is located on the eastern shore of Georgetown Island where the Sheepscot River meets open ocean. Five Islands has a store, a marina, one fish dealer and about 45 houses and cottages all around the small harbor. Bay Point is located on a steep cliff about 80 feet above the water at the mouth of the Kennebec River. There are no stores or any other commercial establishments at Bay Point. The hamlet consists of about 20 houses clustered along the ridge of the cliff overlooking the Kennebec River and the ocean.

Georgetown is relatively isolated and rural. Southport Island and Boothbay are about one and a half miles across the Sheepscot River. The island is connected to the mainland by a steel bridge, but Five Islands and Bay Point are both about 12 miles away from U. S. 1, and 13 miles from the city of Bath.

Major Industries and Economic Pursuits

Fishing and tourism are major industries in the township of Georgetown. In the summer, tourists swarm to Reed State Park, on the eastern side of the island, which has one of the few beaches in this part of the state. The park provides very few jobs for local residents. Several men, however, are employed in the construction trades servicing the several hundred seasonal cottages which occupy most of the shoreline and much of the interior of the island. Only an estimated 20 men are employed at the gigantic Bath Iron Works (shipbuilding), which is the largest employer in the area. Many of the 850 permanent residents of Georgetown are retirees. In the last two years (1976-78), the number of retired people may have grown to the point where they outnumber or exceed the people who are employed.

General Infrastructure

All of the people in Five Islands do virtually all their shopping and obtain all their services in Bath, about 16 miles away. The township has a volunteer fire station, an ambulance service, an elementary school in the hamlet of Georgetown, a couple of marinas, two small seasonal restaurants and very little else in the way of commercial establishments. There are no large public or private installations of any kind on the island.

Port Infrastructure

The anchorages used in Georgetown Island are far from ideal. The anchorage at Five Islands lies between the mainland and two small islands. It is relatively small, can only accommodate an estimated 20 small boats, and is exposed to easterly winds. There is, however, a good town dock at Five Islands, as well as a marina serving pleasure boats. Harmon's Harbor, a small inlet located near Five Islands offers better protection, but is not used by fishing boats. At Bay Point, fishermen simply moor their boats in a line along the shore near their own houses. There is nothing between the boats and open ocean. Since the anchorage is actually in the mouth of the Kennebec River, which drains much of Maine, currents are very swift and dangerous. In addition, the approaches to the anchorages on Georgetown are very dangerous. Since both Five Islands and Bay Point are located at the mouth of rivers, boats must contend with unusual rips and cross currents. The problem is especially acute at Bay Point. In the winter, fishermen from Bay Point regularly moor their boats at Five Islands.

Types of Fishing

Most of the boats at Five Islands are involved in lobstering at least part of the year. Some of them switch over to groundfish dragging, tuna harpooning, or scalloping at some part of the annual cycle. No herring fishing of any kind is currently done by Georgetown fishermen.

Lobster

1. Number of Boats, People, and Fishing Areas

There are eight full-time lobster fishermen operating from Five Islands and an estimated nine local boys who fish lobsters from skiffs during the summer. At Bay Point, there are only five full-time lobster fishermen operating, and one or two part-time fishermen. Almost half of the full-time fishermen are engaged in some other fishery during some part of the annual cycle (see below).

2. Marketing

There is only one lobster buyer in Georgetown--Thibideau's Lobster and Seafood at Five Islands. However, some lobsters are sold directly to Gilmore's Seafood Store in Bath. There is no lobster dealer at Bay Point. The Bay Point fishermen either sell directly to Gilmore's or bring their lobsters to Five Islands where they are sold to Thibideau's.

3. Processing

None.

Groundfish

1. Number of Boats, People, and Fishing Areas

Two Georgetown men have boats which do nothing but drag for groundfish throughout the year. One of these, an older eastern rigged dragger (about 50 feet long), is kept at Five Islands; it has a crew of two. The other (about 45 feet long) is kept at Boothbay and sells its fish to the Boothbay Fish and Cold Storage Company; it has a two man crew. During the spring of the year four men at Five Islands and one at Bay Point convert their lobster boats for dragging. Two of these have an additional crewman at that time.

2. Marketing

The fish caught by Five Islands and Bay Point boats are sold mainly directly to Gilmore's Seafood in Bath. The fish is transported directly to the market by pickup truck on a daily basis. However, some groundfish caught by local boats is sold in Boothbay, and periodically some of it is shipped to Boston and sold through a broker.

3. Processing

None.

Minor Fisheries

Scallops

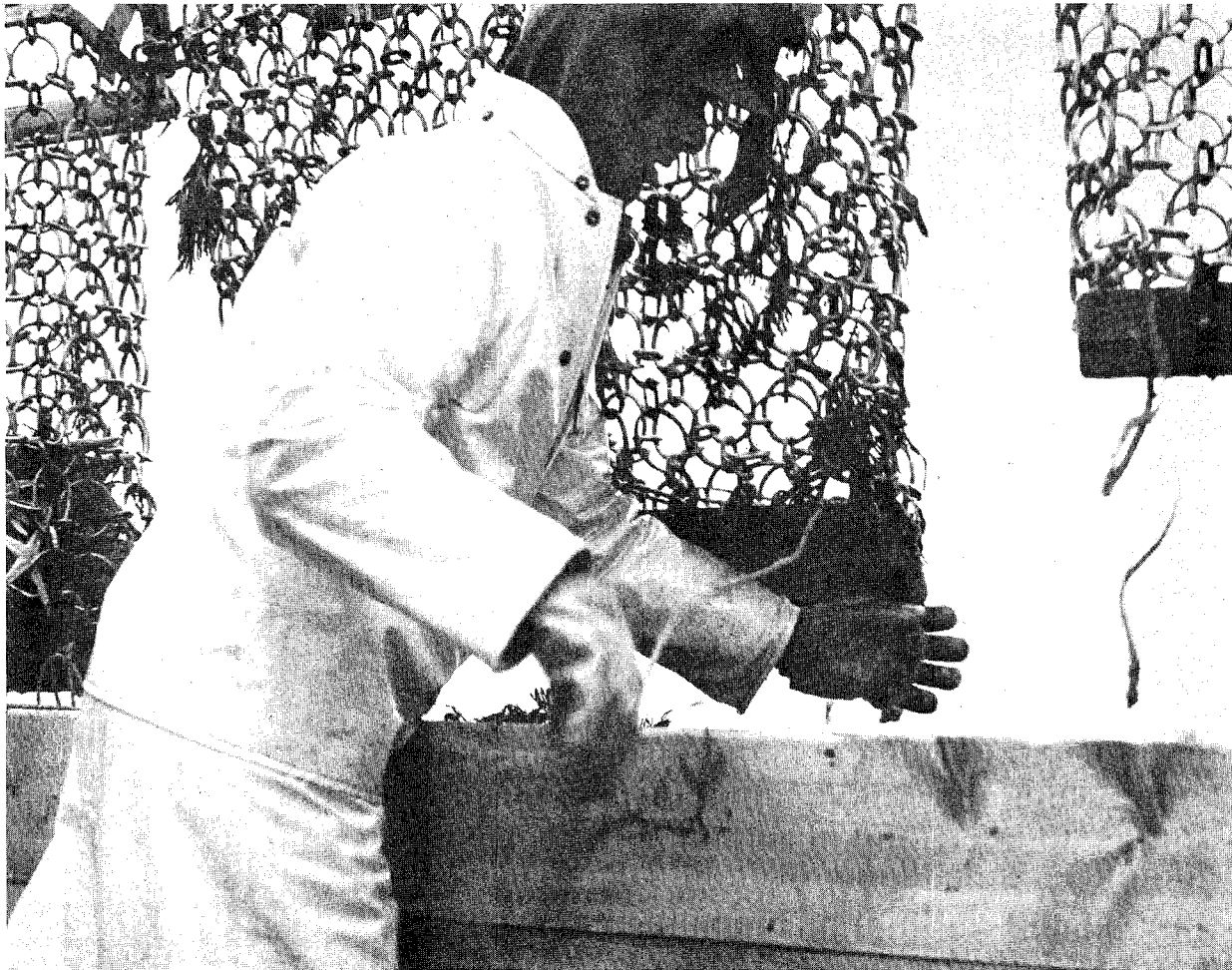
In 1977-78, one lobster fisherman from Five Islands dragged for scallops in the Sheepscot River during the winter. These scallops were sold in Bath and at other local retail outlets.

Tuna

Two Five Islands boats stop lobster fishing in June and spend the middle of the summer harpooning tuna within 15 miles.

Clams

No one makes most of his living clamming in the township of Georgetown. At Bay Point there are five people who dig clams in the summer, in Five Islands, about three such people.



BATH

Physical Setting and Population

Bath is a city of 9679 people located on the west bank of the Kennebec River about 12 miles from the mouth of the river. No fishing is done by boats operating out of Bath. However, the city has one large herring canning plant and has long been one of the most important shipbuilding centers in Maine and the nation.

Major Industries and Economic Pursuits

Bath is dominated by the Bath Iron Works, which employs about 5300 people constructing warships for the U. S. Navy and merchant ships. The firm has one plant on the western bank of the Kennebec River where ships are actually constructed and repaired, and smaller plants a few miles inland. One crane used to lift whole sections of ships is the largest of its kind in the world, and can be seen for many miles away. While Bath Iron Works itself does not make fishing boats, it trains and maintains a large labor force, which is drawn on by smaller yards in the area. Virtually all the yards constructing fishing boats within a 50 mile radius have men with experience at Bath Iron Works.

Besides the Bath Iron Works, the only other plant of any size is the one owned by the Stinson Canning Company. A relatively large number of people are employed in Bath's service industries. In addition, an indeterminate number of people from the Bath area commute 35 miles to Portland to work every day. There are very few accommodations for tourists in Bath, although the Bath Marine Museum attracts many summer visitors.

General Infrastructure

Highway U. S. 1 and Interstate 95 pass through the center of Bath. In addition, the city is served by one of the main lines of the Maine Central Railroad. Bath and the nearby city of Brunswick (7 miles away) are one of the major shopping and service centers in Maine. Bath has a large "downtown" section stretching along the Kennebec for several blocks, a large modern shopping center, a hospital, the County courthouse, and a large number of professional offices.

Port Infrastructure

There are no good anchorages in the river in the immediate vicinity of Bath. There is a very strong current, particularly on ebb tide, and poor holding ground for anchorage. Most of the larger vessels anchor down the river several miles from Bath. Moreover, there are no inlets or breakwaters sheltering boats at Bath itself. Small boats usually tie up to one of the docks lining the banks of the Kennebec River itself near the downtown section. There are no moorings out in the river itself, although several small boats anchor in the Sasanoa River where it enters the Kennebec about one-half mile from the city.

Bath is a customs port of entry, and the U. S. Public Health Service has a part-time physician on call in the city. Despite the large amount of traffic by large vessels, there are no commercial tug boats stationed at Bath.

There are two large marinas operating along the riverfront in "downtown" Bath, which stay open all year: Longreach Marine and Oil Company, and the Bath Fuel Company Marina. Burgess Marina, south of town, serves pleasure boats seasonally. North of the downtown section is the Stinson Company dock and the town landing, which has a wharf, launching ramp, and parking lot for over 50 cars. Just south of the downtown area is the enormous Bath Iron Works with its cranes, plants, docks, and bevy of tied-up Navy vessels. The Bath Marine Museum has taken over several buildings along the Bath waterfront which are of historic importance, dating from the time of Bath's pre-eminence as a builder of wooden ships.

Types of Fishing

No fishing boats of any type regularly operate from Bath. A small, indeterminate number of Bath men dig clams on a part-time basis or are part-time lobster fishermen. These men operate in other towns.

Important Institutions Related to Fishing

Stinson Canning Company Plant

This herring plant is located in a wooden building located on the waterfront at the northern end of town. The plant has long had the normal equipment and technology to pack herring in 3 3/4 oz. cans. More recently, machinery has been added to can herring steaks. It has also recently been equipped with six Baader herring filleting machines.

The plant remains open throughout the year, and employs a total of 125 employees. Only 25 of these employees are on the payroll full-time. The rest work when the plant has fish. In winter, herring are generally trucked to the plant from places in Massachusetts, etc. During the rest of the year, the herring are usually caught much closer to Bath and are transported to the plant by truck or herring smack. The Stinson Company has its own fleet of boats, but most of the fish arriving at this plant are caught by fishermen from the entire coast who are under obligation to sell to the company.

All the canned herring products are sold in the U. S. The filleted herring are packed into cardboard containers, plate frozen, and stored. They are then taken by truck to Gloucester where they are shipped to Europe in refrigerator ships.

Washburn and Doughty Associates

This firm builds steel vessels in its yard on the Woolwich side of the river, across from downtown Bath. The firm employs 35 men, and is capable of building vessels up to 150 feet long. In the one year since it opened, the yard has built four fishing boats (all over 70 feet long) for people in Point Judith, Rhode Island, New Bedford, Massachusetts, and Portland, Maine. Several other large fishing boats are on order.

WEST POINT

Physical Setting and Population

West Point is in the town of Phippsburg on the west side of the Phippsburg peninsula. The hamlet is situated in a very rough and rocky area along a narrow channel which opens out into wider protected areas. The town of Phippsburg has a total population of 1229. West Point probably has a population of several hundred.

Major Industries and Economic Pursuits

The community is relatively isolated, and lacks a developed tourist infrastructure. Fishing is the major local industry. Some people commute to jobs in the Bath and Brunswick area.

General Infrastructure

West Point is served by a short feeder road from highway #209/217. The community has only a couple of small stores. Its population is congregated around the harbor, or rather on the mainland side of a channel, but the area has a generally rural character in spite of the population concentration.

Port Infrastructure

There are no public facilities in the harbor. The two primary seafood buyers have dock facilities where fishermen can load and unload materials. Both of these facilities are situated on a channel which separates the mainland from an island. This island provides good protection from the sea. The channel opens into a larger protected area, as well as providing access to the sea. Lobster boats moor in the channel area, while the larger groundfish boats moor in the bay where more space is available.

Types of Fishing

West Point is the largest of the two groundfishing harbors on the peninsula, and rivals Cundy's Harbor in the nearby Harpswells in size. Lobstering is the other fishery, but is comparatively small.

Lobster

1. Number of Boats, People, and Fishing Areas

West Point has about 15 specialized lobster boats, and as many or slightly more skiffs fishing for lobster in the summer. The skiffs and a couple of the lobster boats fish only during the summer. Most fishermen work alone.

2. Marketing

Both Seaside, Inc. and Cape Small, Inc. purchase lobsters and serve roughly equal numbers of fishermen. Seaside, Inc. sells some lobsters locally in the small retail store operated in conjunction with the dock. Both sell to wholesale buyers. Additionally, one fisherman sells some of his catch to tourists during the summer from a small building by his house.

3. Processing

No processing is done locally.

Groundfish

1. Number of Boats, People, and Fishing Areas

Eight otter trawlers are regularly moored in West Point harbor. These boats range in length from 42 feet to 60 feet, with six 50 feet or over. Two man crews are the norm. Two of the boats anchor at nearby Sebasco Estates.

Three of these boats are owned by Cape Small, Inc. and two at least partially by Seaside, Inc. The rest are owner-operated, as is more typical in Maine's fishing industry.

2. Marketing

Seaside, Inc. and Cape Small, Inc. are the only buyers in the harbor. Seaside handles the catches from three of the otter trawlers, while Cape Small, Inc. serves the remaining five. Both buyers pack fish on ice and ship them to a variety of buyers in the Boston and New York markets--primarily Boston. Groundfish and flatfish are the primary species types landed. When markets warrant, whiting are also landed in substantial numbers.

3. Processing

No processing is done in the local area.

Distinctive and Unusual Characteristics of the Harbor

West Point is a comparatively isolated, fishing-oriented community. Its tourist trade is small compared with that of the surrounding area. The groundfish fleet here is composed solely of relatively old, wooden-hulled otter trawlers of modest size. These boats are designed primarily for inshore dragging. The fact that over half the fleet is not owned by the men who captain the craft is also highly atypical.

SEBASCO ESTATES

Physical Setting and Population

Sebasco Estates is situated about one mile north of West Point on the west side of the Phippsburg peninsula. The harbor area is fairly extensive, and lies about half a mile from the main portion of the community. Sebasco Estates is part of the town of Phippsburg which has a population of 1229 (1970 census). The local population is not differentiated in the census figures, but is probably in the 200-300 range.

Major Industries and Economic Pursuits

The area has one large, luxurious tourist hotel, complete with golf course and beautifully kept grounds. Aside from this, the area has only a couple of small stores. It did have a fish processing plant specializing in whiting, but this closed in 1974.

Most people from the area commute to jobs in the Bath and Brunswick areas.

The area generally conveys the impression of being economically depressed, with numbers of run-down buildings. Along the back road is one area which can only be described as a rural slum.

General Infrastructure

The area is served by a paved feeder road off highway #209. Several additional paved and gravel side roads provide access to the harbor at several points. The area is very rural. There are only two small stores in the hamlet. No other commercial facilities of note exist. People from the area go to Bath to shop and obtain services.

Port Infrastructure

The harbor is a wide long channel of ample proportions. In addition to a number of small private docks, there are the facilities of the fish processing plant, which is currently closed, and a lobster wharf near the head of the harbor.

Types of Fishing

Lobstering is the most important fishery in the area. Two groundfishing boats moor in the harbor, but sell their catches at West Point. In the past, whiting fishing was important in the area, but few whiting are landed now, and the only plant that processed them is now closed.

Lobster

1. Number of Boats, People, and Fishing Areas

There are ten full-time lobster fishermen in Sebasco Estates, all of whom have boats between 28 and 36 feet. There are also five part-time fishermen.

2. Marketing

There is one buyer in Sebasco Estates, the Sebasco Wharf Company, which purchases only lobsters. This company supplies its fishermen with bait and fuel.

3. Processing

None.

Minor Fisheries

No groundfish are landed but two draggers moor in the harbor. They both land their catches at West Point (see section on West Point). An estimated five men in Sebasco Estates dig clams, more or less on a full-time basis.

SMALL POINT

Physical Setting and Population

Small Point is the southernmost harbor on the Phippsburg peninsula. The actual harbor is located in such a way that it can only be reached from the shore by crossing a sand bar and then going on an island. The harbor itself is a pocket formed by two islands. One island is accessible by the sand bar route, while the other can only be reached by water.

Small Point is part of the town of Phippsburg which has a population of 1229 (1970). Small Point's portion of this population is probably only 200 or 300.

Major Industries and Economic Pursuits

The area has a privately owned campground which attracts large numbers of campers during the summer. It also has numerous vacation and retirement homes. Aside from a few small stores and restaurants, the area has a weakly developed service infrastructure.

Many residents commute to jobs in the Bath and Brunswick areas. Fishing in the area is a relatively minor activity.

General Infrastructure

The Small Point area is served by highway #216 which connects it to highway #209 and Bath. The area has a relatively large beach area and a campground located on Hermit Island which is connected to the mainland by a sand bar. There are a few small stores and restaurants, but no major shopping or service facilities. People from Small Point do their shopping in nearby Bath.

Port Infrastructure

The harbor is formed in a channel between Hermit Island and an adjacent smaller island. The only land access to the harbor is by a private gravel road on Hermit Island on which the harbor is located. Hermit Island and the harbor area are private property. By water, the harbor area can only be reached over a bar at the mouth of the channel which cannot be crossed at low tide except by very small boats. The only other facilities in the harbor are operated by Small Point, Inc. which leases the property from the Hermit Island Company, which is under control of Nicholas Sewall.

Types of Fishing

Groundfishing is the predominant fishery at Small Point with lobstering a distant second. No other fisheries exist.

Lobster

1. Number of Boats, People, and Fishing Areas

Five lobster boats operate from Small Point. In addition six to eight skiffs with outboard motors fish during the summer. These fishermen generally operate alone, with an occasional helper on the lobster boats.

2. Marketing

Small Point, Inc., as already noted, is the only buyer in the harbor. Lobsters purchased from fishermen are sold either to outside buyers shortly after landing or to Small Point Pound, Inc. which is another subdivision of Nicholas Sewall's business venture. The pound

purchases lobsters, which are held until market conditions are favorable, and sells them to a variety of wholesale outlets. The pound facility has a capacity of approximately 60,000 lbs. of lobsters.

3. Processing

No processing is done.

Groundfish

1. Number of Boats, People, and Fishing Areas

Six otter trawlers between 43 feet and 64 feet in length fish at Small Point. All of these are relatively old wooden trawlers, designed for inshore dragging.

2. Marketing

Small Point, Inc. is the only buyer in the harbor. Fish are packed in ice and shipped to buyers in either Boston or New York.

3. Processing

No processing is done.

CUNDYS HARBOR

Physical Setting and Population

Cundys Harbor is located at the tip of a peninsula at the northern end of Casco Bay. It is the easternmost harbor in Cumberland County, being separated from the Phippsburg Peninsula and Sagadahoc County by a narrow bay. It is also the easternmost harbor in the town of Harpswell. We have no differentiation of the Cundys Harbor population from that of the total Harpswell population (2552), but it is probably no more than several hundred.

Major Industries and Economic Pursuits

The retirement community in the Cundys Harbor area is large, and apparently increasing. Aside from two very small stores and fisheries related activities, Cundys Harbor has only one small marine research firm. This is essentially a family operation. A very significant portion of the population here, as throughout the Harpswells, commutes to the Brunswick area to retail and manufacturing jobs, to work at the Brunswick Naval Air Station, or to Bath, where they work at the Bath Iron Works.

General Infrastructure

Cundys Harbor is served by a secondary paved road branching off highway #24 which connects it to the Brunswick area.

Aside from two small stores, Cundys Harbor has no retail businesses or commercial developments. People from the area do their shopping and obtain services in Brunswick.

Port Infrastructure

A gravel town launch ramp suitable for small boats is the only public harbor facility available. In addition, there are three privately owned commercial docks. Private docks are also owned by individual fishermen.

Types of Fishing

Groundfishing with otter trawling gear is the predominant fishery in Cundys Harbor. There are as many lobster boats as draggers in Cundys Harbor, but draggers from surrounding areas also unload in Cundys Harbor. The value of groundfish landed surpasses that of lobsters by a wide margin.

Lobster

1. Number of Boats, People, and Fishing Areas

There is a very small local lobster fishery. During the summer there are about 20-25 lobster fishermen operating from Cundys Harbor. Only 10 of these men fish full-time. The rest are part-time seasonal fishermen.

2. Marketing

The Great Eastern Fish and Lobster Company buys lobsters from three to four fishermen, while Peter Darling, across the peninsula on Oakhurst Bay, also purchases lobsters from five to seven fishermen during the summer. The largest buyer is Watson's General Store which serves 12-15 fishermen during the summer and the few full-time fishermen.

3. Processing

No processing is done in the area.

Groundfish

1. Number of Boats, People, and Fishing Areas

During the summer of 1978 seven draggers moored at Cundys Harbor. Four were between 50 and 72 feet in length. The smallest craft in the fleet was 37 feet long. These boats had between two and four man crews. In addition, three boats in the 45 to 60 foot range from nearby harbors in the Harpswells sold fish at Cundys Harbor. Two of these engaged in longlining for swordfish as well as otter trawling. While swordfishing, these crews go on 14 day trips 200 miles out to the waters of the Gulf Stream. Except for the swordfishing season during the summer, when crew size increased to five to six, crews ranged from two to four.

2. Marketing

The Great Eastern Fish and Lobster Company is the only buyer of fin fish in Cundys Harbor. The major emphasis is on groundfish (cod, haddock, hake, etc.) and flatfish (varieties of flounders). During the short summer season, swordfish are important. Most fish landed are sold to buyers in New York.

3. Processing

Fish are packed on ice for shipment. Beyond dressing aboard the boats no processing is done.

Distinctive and Unusual Characteristics of the Harbor

Cundys Harbor has a very small lobster fishery but is the focus of fin fishing in the Harpswells. This is in very sharp contrast to the other fishing harbors in the Harpswells. Its fisheries are more similar to those found along the Phippsburg Peninsula immediately to the east than to those in the Harpswells.

BAILEY ISLAND

Physical Setting and Population

Bailey Island is located in the town of Harpswell at the northeastern end of Casco Bay. It is connected by bridge to Orrs Island, which is in turn connected by bridge to Great Island. Great Island is connected by bridge to the mainland near Brunswick. Bailey Island is part of the town of Harpswell which has a population of 2552 (1970 U. S. Census). The island itself has a population of approximately 350-400.

For the purposes of this consideration Orrs Island is considered with Bailey Island, since the commercial fisheries facilities serving fishermen located there are on Bailey Island.

Major Industries and Economic Pursuits

Bailey Island is the tourist center of the Harpswells. It has about three seasonal motels, six restaurants, and many seasonally-occupied cottages. Fishing is the only other local pursuit of consequence. As in all sections of the town of Harpswell, many people commute to jobs in Bath and Brunswick. Roughly half of the economically active population commutes to work in one of these two areas. There are no industrial plants located on Bailey Island.

General Infrastructure

Bailey Island and Orrs Island are served by Route 24 which provides the only link this area has to the mainland. The area has a relatively well-developed tourist infrastructure with a variety of motels and restaurants oriented toward the tourist trade. The major commercial areas are along the highway near the bridge connecting Bailey and Orrs Island and around the perimeter of Mackerel Cove at the south end of the island. The island has only one seasonal tourist-oriented gift shop and a couple of small stores.

Port Infrastructure

Bailey Island has one extremely good large harbor (Mackerel Cove) at its southern end and a good smaller harbor (Garrison Cove) at its northern end. Commercial wharves are located on both. In addition to fisheries facilities, the island has a variety of marinas, boat yards, yacht clubs, motels and restaurants around its shoreline. These businesses are oriented toward the tourist trade. Only Skilling's Boat Yard provides repair and maintenance services for the fishermen. Most fishermen take their boats to Wheddon's Shipyard in Harpswell or to Wallace's Yard at Great Island. The harbors also have a few docks owned by fishermen. There are public town launch ramps on both Mackerel and Garrison Coves. Both are paved and suitable for launching small boats.

The area, particularly Mackerel Cove, becomes congested in summer as many yachts and smaller pleasure boats take advantage of this well-protected anchorage.

Each summer a tuna fishing tournament is held, at which time Mackerel Cove fills to overflowing (Tuna fishing throughout the area is considered as a sports fishing activity.)

Types of Fishing

Lobstering, to the exclusion of other forms of fishing, dominates both Bailey and Orrs Islands.

Lobster

1. Number of Boats, People, and Fishing Areas

Bailey Island has about 40 specialized lobster boats and the same number of skiffs engaged in

summer lobstering. Crews on the lobster boats are usually two men, and occasionally three. Skiff fishermen operate alone.

2. Marketing

Mackerel Cove has two lobster buyers. Glen Johnson of Glen's Lobster Pound is the largest lobster dealer in the area, serving over 40 fishermen. Twenty-five of these boats are owned by full-time fishermen. Edmond Black, more or less retired, operates only during the summer and purchases from four fishermen. He resells to Glen Johnson. The Dockside Marina adjacent to Glen Johnson's facility is the only fuel dealer in the harbor, and supplies fuel to fishermen as well as pleasure craft.

The remainder of the fishermen are served by Cook's Lobster Pound on Garrison Cove. Morris Cook has circulating sea water lobster tanks which he estimates can hold about 3000 pounds of lobsters. In contrast to Glen Johnson who sells primarily to several large wholesale buyers, Cook sells a large portion of the lobsters he handles either retail or to small buyers. He closes his facility during the winter.

In addition, Rick Webber at Lowell's Cove on Orrs Island has recently begun purchasing limited quantities of lobsters. One lobster fisherman transports loads of lobsters to Montreal several times a year in his own truck.

3. Processing

No processing is done locally.

Clams

1. Number of Boats, People, and Fishing Areas

About 15 to 20 men earn most of their income by clamming in the area. Many of these men come from Great Island and do most of their clamming in the upper reaches of the bays in the Harpswell region.

2. Marketing

Most of the clams dug in the local area are sold to Moody's shucking house on Great Island. Large numbers of clams are sold to dealers in Portland. At times wholesalers from Portland send trucks to Great Island and the Bailey Island area to buy clams.

3. Processing

Moody's shucking house on Great Island employs 5 or 6 women to shuck clams.

Herring

1. Number of Boats, People, and Fishing Areas

There are three stop seine operations in the Bailey Island area. Two of the men running these herring operations are fundamentally lobstermen, who stop seine on a part-time basis. The other is a draggerman who has a very large stop seine operation and has several twine dories.

2. Marketing

The herring from all three stop seine operations are sold to nearby plants. One regularly sells to Holmes Packing Company in Rockland, but fish from the Harpswells are also sold to Kasbay in Portland, and the Stinson Canning Company plant in Bath.

3. Processing

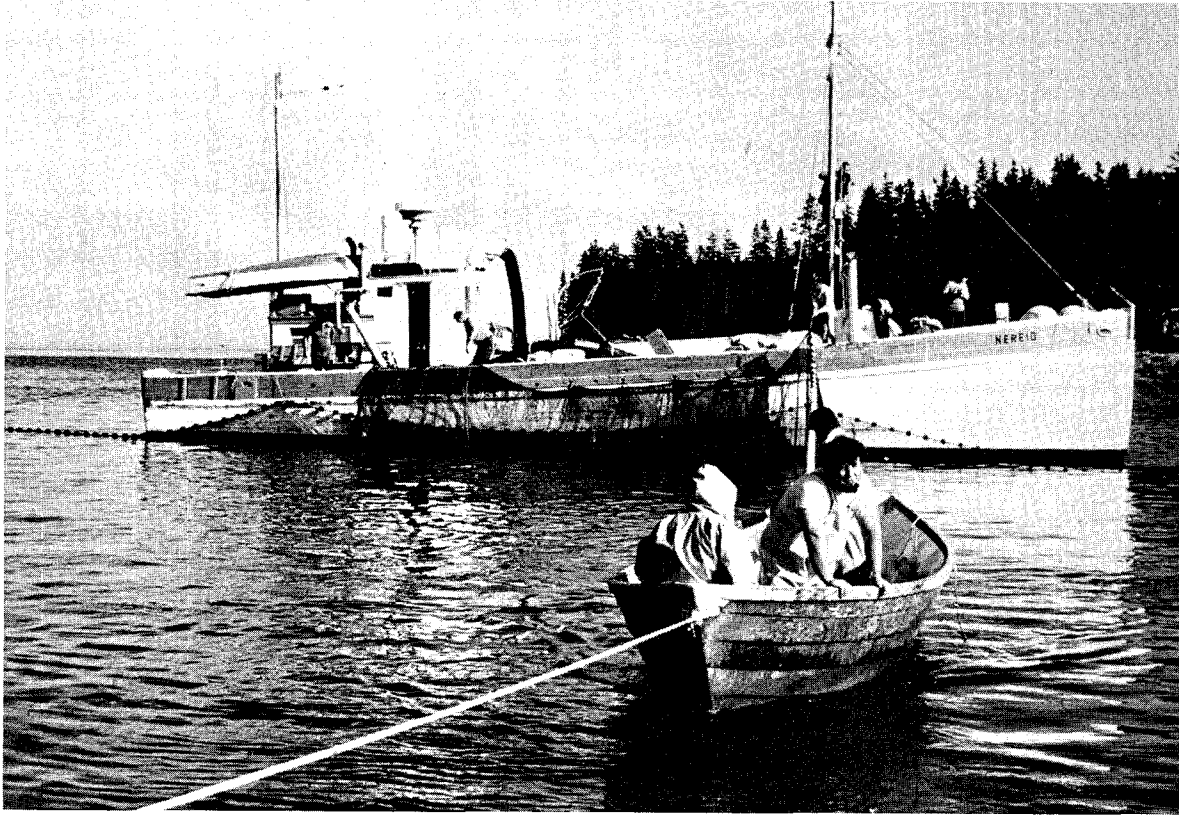
No local processing is done.

Minor Fisheries

Three otter trawlers (45-60 feet) moor in the area. The owners of the boats live in the islands and sell their catches at nearby Cundy's Harbor. One of these boats engages in longlining for tuna during the summer while another is old and small (45 feet) and is used only close to shore during the spring.

Wormers from Wiscasset periodically exploit the flats in the Harpswell area, but no local men dig marine worms. A few men go "mossing." The moss (seaweed) is sold to a buyer for the Stauffer Chemical Company of South Portland.

In the summer about 15 boats (pleasure and fishing boats) go tuna fishing. Although the Tuna Tournament is considered a sport, the tuna are generally sold for high prices (\$2.00/lb.) to Japanese buyers.



HARPSWELL-SOUTH HARPSWELL

Physical Setting and Population

The town of Harpswell has a population of 2552 (1970 U. S. Census) who live in four hamlets: Orrs Island, Bailey Island, Harpswell Center and South Harpswell. Harpswell Center and South Harpswell are located on a 12 mile long peninsula jutting into the Gulf of Maine. To the east are Orrs Island and Bailey Island; to the west Casco Bay. The peninsula has numerous coves all along its irregular shoreline.

Major Industries and Economic Pursuits

Tourism is a major element in the economy of the area. Nearby Bailey Island is the focus of the tourist trade and has a lot of facilities for transient tourists. Harpswell Center and South Harpswell tend to have more seasonal cottages and retirement homes, and few restaurants and motels.

A large number of people commute to jobs in the Bath and Brunswick areas. As in the rest of the Harpswells, this tends to create something of a bedroom community atmosphere. The area has relatively few stores and local businesses not oriented toward the tourist industry. The major shopping area for the region is in Bath and Brunswick.

Fishing is a major economic pursuit in the area; the income it generates is not as great as that derived from tourism and commuting residents.

General Infrastructure

The area is served by highway #123 which runs the length of the peninsula. This links the region to Bath and Brunswick.

The retail and service infrastructure of the area is not well developed, and is oriented predominantly toward the tourist trade. There are only a few small stores and restaurants; most goods and services are obtained in Brunswick or Bath.

There are no industrial plants in the area and no government installations save for a U. S. Navy oil depot where fuel is stored for the Brunswick Naval Air Station.

Port Infrastructure

Harpswell has several good anchorages. Potts Harbor and Harpswell Harbor are among the best in the area, but numerous areas are suitable for small numbers of boats. Potts Harbor has a paved town launching ramp suitable for small boats, as does Harpswell Harbor. Potts Harbor also has a small town dock. The area has several small marinas and boatyards oriented toward the pleasure craft trade. Whedden's shipyard, however, is capable of handling the largest draggers used in the area.

There are two small commercial docks in South Harpswell at the lower end of the peninsula and a third near Harpswell Center half way up the peninsula on its west side.

Types of Fishing

Lobstering is the most important fishery in the Harpswell and South Harpswell area. Groundfishing is a distant second. Longlining for swordfish is done by two craft based in the area. They also otter trawl.

Lobster

1. Number of Boats, People, and Fishing Areas

There are some 35 full-time lobster fishermen in Harpswell and South Harpswell. Fishermen from Harpswell fish very large gangs of traps. Many of these men fish over 1000 traps. Most of these fishermen have 35 to 38 foot boats and a sternman; 3 boats, however, are 40 to 45 feet and have 3 man crews. None of these fishermen fishes for lobsters offshore. In addition, in the summer there are approximately 25 skiff fishermen who fish alone.

2. Marketing

Twelve full-time fishermen from South Harpswell and Harpswell sell their catches to Allen's Seafood, which handles not only lobsters but also a lot of mussels. Another 10 to 12 men sell their lobsters to Interstate Lobsterman's Cooperative. Four men sell to Bibber's Lobster Pound.

3. Processing

No lobsters are processed in the area.

Groundfish

1. Number of Boats, People, and Fishing Areas

Three boats from the area pursue groundfish. Two of these are in the 60 ft. class and moor in Harpswell Harbor. Their owners live nearby on the peninsula. These craft otter trawl most of the year and longline for swordfish during the summer. Swordfishing crews range up to six or seven, while dragging crews are between three and four. The remaining 48 ft. boat is based at Allen's Seafood Wharf on the west side of the peninsula near Harpswell Center. This small craft is used in a highly varied manner, taking groundfish, scallops, mussels, whiting, and even menhaden at times. Its owner also does some lobstering with a second smaller boat. Crew size varies from just the captain up to four.

2. Marketing

The two larger craft generally sell their catches to the Great Eastern Fish and Lobster Company at Cundy's Harbor. Occasionally, catches will be sold to buyers in Portland. One of the boats usually sells swordfish in Portland. The remaining boat sells to Allen's Seafood Wharf, which in turn usually sells to buyers in Boston.

3. Processing

No processing is done locally.

Distinctive and Unusual Characteristics of the Harbor

The Harpswell area is unusual because of the large numbers of lobster traps used in "trawl" configurations (see Bailey Island).

In the southern part of the peninsula, particularly in the Potts Point, Harpswell Neck and Ash Point areas the concentrations of seasonal residences are dense. They rival those on Bailey Island or heavily developed coastal areas south of Portland.

Mussels

1. Number of Boats, People and Fishing Areas

In recent years, a few men have gathered mussels from small skiffs and dories. In 1978, two

boats began to drag mussels from inboard-powered vessels, and further expansion of this fishery appears likely.

2. Marketing

Mussels are bought by Allen's Seafood and the Interstate Lobsterman's Cooperative. Most are sold in New York.

3. Processing

Mussels are sold as shellstock. No processing is done locally.



SOUTH FREEPORT

Physical Setting and Population

South Freeport is in the town of Freeport, located about 15 miles north of Portland on the headwaters of Casco Bay. While Freeport as a whole has 4781 people, the little hamlet of South Freeport has only a few hundred people in houses scattered along the shore. There are many cottages in the area, so that the population of South Freeport expands enormously in the summer. Very little fishing is done in the town.

Major Industries and Economic Pursuits

No major industries are located in South Freeport. The town of Freeport as a whole has three large plants: The Eastland Shoe Corporation employing 450 to 500 people; Loree Footward Corporation (a subsidiary of Lehigh Valley Industries) with about 220 employees, and L. L. Bean Corporation, a world famous sporting goods supplier, which has 650 employees at the height of the season. Freeport is so close to Portland that a good many inhabitants commute to Portland daily to work. Freeport itself has a small shopping center, but clearly most of its inhabitants do most of their shopping in Portland or nearby Brunswick. Wolf Neck State Park, a small park located on the shore in South Freeport, attracts a moderate number of tourists.

General Infrastructure

South Freeport can be reached only by a small town road from Freeport itself. Freeport is directly on Interstate 95 and U. S. 1, so that residents of South Freeport have ready access to the cities of Portland to the south, and Brunswick 15 minutes to the north. There are no stores, shopping centers, or professional offices in South Freeport. In addition, there are no large industrial plants or governmental facilities of any kind.

Port Infrastructure

There are very few facilities located in South Freeport, and all of them are located around the town landing wharf. Next to the town wharf itself is the Harraseeket Lobster Company, which serves South Freeport's lobstermen from its own private dock. The company has one building, which houses a wholesale and retail store selling nothing but lobsters, as well as a small takeout restaurant, which is open only in the summer. The company also owns a small bait shed.

There are also two boat yard marinas near the town landing which service pleasure boats and supply yachtsmen with gas, ice, etc. during the season. One, the Harraseeket Marine Service Company, has a chandlery, which sells boat supplies and hardware, and has a mobile boat launching machine and a boat yard capable of storing about 125 yachts. The second, Rings Marine, has a marine railway and a boat yard used for winter storage. A little further up the Bay is Dunning's Boat Yard, which stores boats and does repairs. In the summer a small passenger ferry boat operates between the South Freeport public wharf and Bustin Island.

Types of Fishing

Only a few lobster boats operate out of South Freeport. There are no fishing boats of any kind and no processing facilities for landing groundfish.

Lobster

1. Number of Boats, People, and Fishing Areas

There are eight full-time lobster fishermen operating from South Freeport. These men fish only from April to December. South Freeport is so far up Casco Bay that winter fishing is

the rest use outboard-powered skiffs.

2. Marketing

There is no fish dealer who operates a dock in Yarmouth. Some of the lobsters are sold at Day's Crabmeat shop, which operates a small restaurant and fish market on U. S. 1 in the summer.

3. Processing

Day's Crabmeat cooks and picks enough lobster to supply its takeout stand and retail outlet. It is a very small operation.

Important Institutions Related to Fishing

Royal River Packing Company

This company operates a herring packing plant located on the south shore of the Royal River, near the nucleated section of the town. The firm is housed in a large wooden structure built in the World War I era. The firm is currently owned by Port Clyde Packing Company, and employs between 65 and 100 people at the height of the herring season in the summer and fall. Until 1976, the firm did nothing but pack sardines in cans sold under the Port Clyde brand. Since 1977, it has done nothing but pack butterfly fillets for the foreign market. These large herring are filleted by machine, plate frozen, packed in 30 pound boxes, and shipped to Germany on refrigerator ships. Some of the herring are currently supplied to the Royal River Plant by Port Clyde's fleet of carriers: the "Delca" and "Nereid." However, most are brought to the plant in trucks from ports in Maine, Massachusetts and Rhode Island. The fish packed by Royal River come from some 8 to 10 purse seiners and 10 to 20 stop seine operations in various parts of Maine. Some of the fish come from pair trawlers, especially in winter, which are operating in Massachusetts and Rhode Island.

FALMOUTH FORESIDE

Physical Setting and Population

Falmouth Foreside is a very wealthy suburb of Portland and is in the town of Falmouth. In 1970, the town had a population of 1621. U. S. 1, the Maine Turnpike, and Interstate 95 all go through the town.

Major Industries and Economic Pursuits

The vast majority of the people in Falmouth Foreside work in Portland or other nearby towns. Most have white collar jobs. The town has no manufacturing plants or any other industries. Most of the inhabitants use services supplied by Portland. The town does have one large shopping mall on U. S. 1, and a small awning factory employing about 10 people.

General Infrastructure

Falmouth Foreside is very close to Portland with its shopping centers, offices and airport. There are no large installations in the town of any kind. The income level of the town is very high, and the inhabitants do maintain many recreational facilities, including the Maine Audobon Society, yacht clubs, a marina, a raquetball club, tennis club, and a golf course.

Port Infrastructure

The town of Falmouth Foreside operates a very small town landing and a dock. However, the Portland Yacht Club is located in Falmouth. Next to the Yacht Club is the Handy Boat Yard, which has a restaurant, chandlery, boat storage facilities, gas pumps, and a repair service. Both the Yacht Club and Handy Boat Yard cater to very wealthy clients. It is doubtful that any fishing boats would be permitted to land at either of their piers. Between the Boat Yard and the Yacht Club the harbor area swarms in the summer with over 100 yachts, some of them very large and very expensive (i.e. over 70 feet long and encrusted with teak).

Types of Fishing

There are no professional fishermen who operate their boats from Falmouth Foreside. A few fishermen live in Falmouth but keep their boats in Portland. In the summer, there are a very few part-time lobster boats operating from Falmouth Foreside.

Lobster

1. Number of Boats, People, and Fishing Areas

An estimated five or ten part-time lobstermen fish from Falmouth Foreside. Most could best be described as recreational fishermen. A couple of fishermen, however, have good-sized operations.

2. Marketing

There are no fish dealers or buyers operating in Falmouth Foreside. Fishermen either sell their catches to local restaurants, or more commonly sell them to dealers in nearby Portland.

3. Processing

No processing of any kind.

PORTLAND

Portland is now, and long has been, the largest and most important city in Maine. It is the transportation hub of the state, the largest manufacturing center, and the medical focal point of Maine. It is also Maine's largest and most complicated fishing port, and one of the largest oil importing ports in the United States.

Physical Setting and Population

Portland is located in the southern coastal region of Maine--only 48 miles from the New Hampshire border. Boston lies 100 miles to the south, Montreal is 210 miles inland, and Yarmouth, Nova Scotia is 187 miles northeast by ferry.

The city itself sets in Casco Bay, an enormous bay extending for some 20 miles and studded with some 200 islands. The outer harbor is capable of sheltering the largest ocean-going vessels. The inner harbor is the Fore River.

Portland itself has only 22.4 square miles, and a population of only 65,000 (1970). However, it is ringed by a large number of smaller cities and towns, making the population of the greater Portland area 183,400. Over 50% of Maine's total population lives within 30 miles of Portland and is largely dependent on the services Portland supplies.

Portland's population is relatively homogeneous. The vast majority are White, Anglo-Saxon Protestants. Some minority groups are present: Franco-Americans, Jews, Irish, and Italians, as well as a small number of Poles, Greeks, Armenians, and Blacks. All these minority groups are very well assimilated, and are generally not concentrated in enclaves of any kind. Of the total population in the greater Portland area, 99.4% are White, .3% Black, and .3% classified as "other" (1970 Census). With the exception of the few hundred Blacks, members of these minority groups are almost invisible. Only the churches (e.g. the Black Baptist church, Greek Orthodox, French Catholic, etc.) are visible reminders of the existence of these groups. All of the people involved in the fishing industry and businesses which support that industry are White Protestants of old Yankee stock. The only exceptions are a few boats owned by a small number of Italian and Norwegian families. But these people are scarcely ethnics, since their families have been in Portland for at least two generations.

The towns in the Portland area are obviously stratified by income and social class. Portland has a high proportion of poor people, while the suburban towns of Cape Elizabeth and Falmouth Foreside have a very high percentage of very affluent and influential families. In 1975, the median family income was \$9,958.00. Portland and Old Orchard Beach had the lowest median figures (\$8,456 and \$7,914 respectively) while Cape Elizabeth had a median family income of \$13,516 and Falmouth had one of \$11,554.* As might be expected, a very high percentage of the elderly population is located in Portland.

Major Industries and Economic Pursuits

While Portland is Maine's largest fishing port, the fishing industry is dwarfed by manufacturing, transportation, and other commercial enterprises.

The city and surrounding area have a wide range of manufacturing plants. The largest are the S. D. Warren Company which has an enormous paper mill in nearby Westbrook, employing some 3,000 people; Fairchild Semiconductor, employing 2500 people; General Electric in South Portland employing 200; Burnham & Morrill (food processing) employing 400; Herman Shoe Company in Scarborough employing 600; Sebago Shoe Company of Westbrook employing 500; American Hoist and Derrick Company (steel machine parts, wire) employing 350; Health-Tex (clothing) employing 400; Jordan's Meats with 200 employees; Nichols Company (motors, pumps) employing 300; Nissen's Bakery employing 400; Portland Company employing 200; Oakhurst Dairy employing 200; Songo Shoe Company with 300 employees; and Southworth Machine Company with 250 employees. These are the big employers

*Greater Portland Overall Economic Development Study, p. 26.

in the area, although there are dozens of smaller firms. In general, manufacturing in Portland is dominated by companies making paper, machine tools, shoes and electronics.

In addition, Portland is the banking capital of Maine and has a dozen large banks employing hundreds of people. It is the home of Union Mutual Insurance Company, and of the Guy Gannet newspaper and printing company. All told, the finance, insurance, and printing businesses employ 6,000 people.

One of the largest industries in the area is transportation and wholesaling. Given the central location of Portland its transportation facilities, it is not surprising that it is home to a long list of trucking firms and wholesale companies which stock the shelves of stores in the interior of the state.

Tourism is a very large business in Maine, but it is not of major importance in the Portland area. People from out of state do not come to Maine to see industrialized urban areas.

General Infrastructure

Portland is at the transportation hub of the state. It is difficult to go from Maine to any other location in the United States without passing through Portland. Interstate 95 and U. S. 1, the most important highways in the state, join at Portland. Portland also has an excellent international airport, and a ferry terminal linking the city with Yarmouth, Nova Scotia. Three railroads go through the city: the Maine Central, Boston and Maine Railroad, and Canadian National Railroad. There are two bus terminals in the central part of the city as well.

The city has two large hospitals, including the Maine Medical Center, one of the training institutions affiliated with Tufts Medical School. A small branch of the University of Maine and the University Law School are also located in Portland.

As was pointed out in the previous section, Portland contains a very high proportion of all industrial plants in the region.

The city also has excellent shopping facilities. The shopping district and Portland's professional personnel serve a very high proportion of the people in Maine.

Portland is suffering from many of the same ills besetting other central cities on the Eastern seaboard. It has a higher percentage of older, decrepit buildings than surrounding towns. It also has more pollution problems, a higher crime rate, etc. Recently there has been a real effort to revitalize the downtown area--particularly the so-called Old Port Area where many of the nineteenth century brick buildings have been fixed up and now contain sophisticated stores, restaurants, some very expensive apartments, and offices.

Port Infrastructure

All fishing docks and facilities are located along a mile long section of Commercial Street, which is very close to the shopping district and the newly-renovated Old Port section. It is a very congested section of Portland. On one side of Commercial Street are a series of old brick buildings housing hardware stores, restaurants, warehouses, and wholesale dealers. On the other side are a series of long wharfs jutting out into the harbor, which generally contain two, three or more businesses connected to fishing, (e.g. fish dealers, boat supply shops, engine repair facilities, etc.). Up the middle of the street run the train tracks serving the piers, grain storage facilities, and factories.

The renovation of the Old Port section has generally not extended to Commercial Street only a block or two away. Some of the buildings housing fish dealers date to the early 1800's. There are so many rotting docks that fishing boats have a difficult time finding a solid place to tie up. Across the Fore River is the oil depot located in South Portland. The two sides of the river stand in some contrast. On the South Portland side is a large tank farm, a pumping station, and facilities capable of unloading the largest modern oil tankers. On the north side of the river is concentrated the fishing industry, in what may be one of the most decrepit waterfronts

on the entire East Coast.

We will first list the various wharfs and docks, and later the various kinds of government units with facilities along the waterfront. The fish plants, fish buyers, etc. will be covered later in the section entitled "Important Institutions Related to Fishing."

| <u>Dock Name</u> | <u>Use</u> |
|--|--|
| Gulf Oil Corporation Wharf | Piping Oil |
| Cianbro Corporation Wharf | Mooring construction equipment |
| Portland Terminal Wharf No. 3 | Inactive |
| Portland Gas Light and Oil Company Wharf | Inactive |
| Portland International Ferry | International Ferry |
| State Street Wharf | Fishing boats and gear |
| Deak's Wharf | Mooring for marine contractor, and warehouse |
| Sturdivant Wharf | Warehouses, machine shop |
| Holyoke Wharf | Fish intake and processing |
| Berlin Mills Wharf | Ship repair and boat mooring |
| Hobson Wharf | Inactive |
| Greely Wharf | Receiving salt and coal by rail |
| Wright's Wharf | Navy base and dock |
| Brown's Wharf | Fish receiving and boat mooring |
| Merchant's Wharf | Tug and boat building , boat moorings |
| Richardson Wharf | Mooring small boats |
| Merrill Wharf | Boat docking, receiving by train and truck |
| Union Wharf | Warehouse and fish handling |
| Widgery Wharf | Boat mooring and fish offloading |
| Central Wharf | Numerous businesses; fish handling; boat docking |
| Pocahontas Wharf | Bank parking lot and new marina construction |
| Portland Pier | Casco Bay car ferry docking; boat mooring; and a few other businesses (fuel, bar, lobster) |

| <u>Dock Name</u> | <u>Use</u> |
|-----------------------------------|--|
| Custom House Wharf | Fish handling; storage; Casco Bay ferry; various businesses; boat mooring |
| Maine Wharf | Various businesses (chandler and marine contractor); boat mooring |
| Maine State Pier | Receive and handle cargo trade; fishing boat and Coast Guard mooring; and various other businesses |
| Canadian National Railroad | Unusable at present--being considered for future construction |
| Webber Petroleum Wharf | Oil |
| Burnham and Morrill Company Wharf | |

Government Agencies and Facilities

The Federal and state governments maintain several agencies and facilities along the Portland waterfront. Most of these have only ancillary connections with the fishing industry. These are listed below:

A. Federal Agencies

1. U. S. Navy: This agency maintains a base on Commercial Street which houses a recruiting office, and has a large pier. This facility serves as a base for two minesweepers which are used primarily to train U. S. Navy Reserves.
2. Immigration and Naturalization Service: This agency has an office in the Customs House on Commercial Street.
3. Border Patrol: In the course of its normal duties, this agency inspects all the fish coming from Canada on the ferry.
4. National Marine Fisheries Service: This service maintains a small office in the Customs House on Commercial Street. The office contains only three people, who spend most of their time compiling landing statistics from Portland and other parts of Maine.
5. National Weather Service: This service maintains an office at the Portland International Airport.
6. Merchant Seaman's Clinic: This clinic is located in a set of buildings on the waterfront. The clinic, which is operated by the U. S. Public Health Service, is located in a set of buildings on the northeastern side of the Portland waterfront, near the Falmouth town line. The clinic provides outpatient services to seamen from the large vessels, primarily oil tankers and U. S. Coast Guard vessels, coming into the Portland area. Local fishermen are also eligible for certain services, but generally do not take advantage of them.
7. Disaster Loan Office: This office is located in the Federal Building on Forest Avenue. In recent years, this office has been a major source of funds to replace fishing gear destroyed by storms or foreign vessels.

B. State Agencies

1. Department of Environmental Protection: This agency maintains an office at Maine Wharf. The major function of this office is to inspect Portland Harbor for oil spills emanating from oil tankers or any other boats.

2. International Ferry Terminal: This terminal is owned by the state of Maine, but is leased to a private company which provides services to the two firms operating the ferry boats going between Portland and Yarmouth, Nova Scotia. One company is American-owned and operates the "Caribe." The other is a Canadian-owned company which operates the "Evangeline." The "Caribe" is more oriented to the tourist trade, while the "Evangeline" carries a lot of cargo. Both boats carry Canadian fish trucks, supplying a large proportion of the U. S. market. A few of these trucks discharge their loads at local wholesalers (e.g. Willard and Daggett), but most sell their cargo in Boston, Gloucester or New York.
3. Department of Transportation: The director of the Bureau of Waterways maintains an office on Maine State Pier. This office concerns itself primarily with oil tankers and cargo ships.

Marine-Related Firms

1. Danforth Corporation: This firm maintains a plant along the Maine Turnpike, where it manufactures compasses, anchors, and other marine hardware, primarily for the pleasure boat trade.
2. Fishermen's Supply Company: Located on Union Wharf, this firm manufactures gillnets and repairs other fishing gear. It also operates a small store where it sells marine supplies.
3. Industrial Marine Products: This firm manufactures nylon and monofilament nets on Custom House Wharf.
4. Chartroom, Inc.: This firm operates a store on Dana Street, near the waterfront, where it sells all kinds of marine-related equipment, primarily for the pleasure boat trade.
5. Chase and Leavitt: The firm operates a store on Dana Street, where it sells marine supplies.
6. O'Day Marine Supplies, Inc.: This firm operates a small marine supply store on Union Wharf.
7. Ross Marine Electronics: This firm sells and services all major brands of radios, loran, and fish finding equipment at its store on Commercial Street.
8. Golten Ship Repair, Inc.: This firm has a shipyard on Commercial Street, employing up to 50 people, who repair fishing boats and other craft. The firm has a derrick, but no marine railway.
9. Industrial Welding and Machine, Inc.: This is a medium-sized firm employing 26 to 35 people, which specializes in all kinds of marine repairs.
10. Gowen Electric and Marine Division of Gowen, Incorporated: This firm employs 50 to 60 people in its plant on Maine Wharf where it repairs food packing equipment, fabricates parts from aluminum and steel, and repairs machinery. The firm also does a great deal of welding and ship repair.
11. Atlantic Diving Company: This firm is located on Custom House Wharf, and provides a large number of services to the maritime community: piling restoration, salvage, marine surveys, and marine insurance. The firm provides marine engineering and consulting as well.
12. General Marine Construction Corporation: This firm specializes in pier construction and dredging. It also provides towing and driving services.
13. Maine Ocean Marine Services: This firm is located on Exchange Street, and does nothing but marine surveys.
14. Communications Incorporated: This firm operates a store on Commercial Street where it sells and services all major brands of marine communication equipment, including radios, fish finding gear, and navigational gear.
15. Hammar Fluid Power Marine Division: This company sells and repairs hydraulic equipment in its shop on Union Wharf.

16. Stultz Electric Works: A large electronic sales and repair facility located on Commercial Street. The firm also sells marine hydraulic equipment.
17. Kennebec Maintenance Company; This firm maintains a shop on Fore Street where it sells and repairs fishing equipment, particularly hydraulic machinery.
18. Peterson O. P. Company: A ship repair firm.
19. Bruce Diesel Incorporated: This firm has a small shop on Central Wharf where it repairs diesel engines.
20. Harbor Supply Oil Company: This firm is located on Portland Pier where it repairs ships and engines, sells machinery parts, and sells oil to local boats. The firm also has two boats which it uses to supply oil to the Casco Bay Islands.
21. Casco Bay Lines: This company operates five ferry boats linking Portland with the Casco Bay Islands. It operates Custom House Wharf.
22. Dimillo's Marine: This marina is currently under construction on Pocahontas Wharf.
23. Portland Sebago Ice and Oil: Although this firm is located on Commercial Street and has no wharf of its own, it is currently the only major firm supplying ice and fuel oil to Portland's fishing fleet.
24. Cumberland Cold Storage: This company is located in a large building on Commercial Street, and provides a very large amount of freezer capacity which it rents to Portland's fish dealers and processors.
25. Northeast Cold Storage Company: This company has its freezer plant on Reed Street, about two miles from the waterfront. It is the largest freezer plant in the Portland area, and provides freezer space to fishing firms and other food processing businesses in the area.
26. Shurtliff Company: This company provides salt for Portland's fishing fleet from its warehouse on Commercial Street.

Types of Fishing

Lobster

1. Number of Boats, People, and Fishing Areas

In 1974, there were about 450 lobster licenses issued to people in Portland, Cape Elizabeth, Falmouth, and the Casco Bay Islands. Only 74 of these men could be considered "full-time" fishermen in 1978, and they are not all active throughout the year. One hundred seventy five are part-time fishermen; the remainder are completely inactive. Virtually all of the full-time fishermen market their lobsters consistently at the dock of privately-owned dealerships. A good many of the part-time fishermen fish only enough to get lobsters to supply their own family or sell privately.

A large proportion of the boats used by the part-time fishermen are outboard-powered skiffs. The full-time fishermen in the area tend to have large boats and very large gangs of traps. Several full-time lobster fishermen have boats in excess of 40 feet and over 1500 traps, which they haul with the help of one or two sternmen. At least half of the full-time operations have two-man crews.

Portland lobster fishermen exploit waters on the western side of Casco Bay. Men from Harpswell maintain their own lobstering areas. Men from Chebeague, Long Island, and Jewell Island sell in Portland, but also have their own fishing zones in the area of their home islands.

Fourteen lobstermen switch to groundfishing during part of the year.

2. Marketing

There are at least eight places in Portland where local lobstermen sell their catches. The Fisherman's Cooperative used to be a big buyer. It has recently been purchased by Lusty Lobster Company of Bremen. New Meadows Lobster Pound, Coastal Fisheries, and Sea Breeze Lobster also buy substantial amounts of lobsters from local fishermen. Smaller amounts are bought by Harbor Fish Market and Fathoms East, which buy directly from about seven local fishermen each. Montebello Fish Company and Churchill Lobster Products also buy some lobster from local fishermen.

Dealers in the Portland area provide few services in comparison with those in other ports of the state. Some get their fishermen bait, but typically the fisherman buys his own gas at one of the wharfs in South Portland, provides his own anchorage, and finds his own dock space.

3. Processing

Montebello Fish Company and Churchill Lobster Products Company pick out a lot of lobster and sell the lobster meat.

Groundfish (Inshore)

1. Number of Boats, People, and Fishing Areas

There are 40 inshore groundfish boats in Portland: 25 are primarily gillnetters and another 15 are draggers. Most of these boats are between 40 and 60 feet long. Approximately nine of the boats switch between gillnetting and dragging over the course of the year. There are, in addition, another 14 boats whose owners go lobstering most of the year, but switch to ground-fishing with otter trawl or gillnet in the spring.

The larger inshore boats go fairly regularly to Jeffrey's and Cashes Ledge, which are only 30 miles and 80 miles respectively from Portland harbor. Periodically, some of these boats might go as far south as Portsmouth, New Hampshire or as far east as Monhegan Island. However, these boats spend most of their time fishing much closer to Portland. All of the smaller and/or older groundfish boats do all of their fishing within a few miles of Portland harbor. These boats tend to concentrate on the Cod Ledges (four miles out), the lightship (ten miles out), Halfway Rock, Tanner Grounds (off Old Orchard Beach), and other nearby areas.

All of these inshore groundfish boats are privately owned and all but five or six are skippered by the owner. However, an indeterminate number of boats are partly owned by silent partners--men who are in business or the professions in the Portland area, or who are fish dealers.

Gillnetters normally have crews of three to five, while the draggers have mainly two to three person crews.

2. Marketing

All of these boats sell all of their fish in Portland. The vast majority have a steady working arrangement with one dealer. The ice and gas are not obtained from the dealer where boats sell their fish, but rather from the Portland Sebago Ice Company.

Most of the groundfish are sold to: Willard and Daggett, United Fish Company, Atlantic Seafood Products, Inc., and Harbor Fish Market. Pioneer Fish buys only dogfish. Most of these fish are shipped ultimately to the Boston market.

3. Processing

A large number of fish are processed locally. The following firms fillet groundfish: Willard and Daggett, Pioneer Fish, R and S, North Atlantic Seafood Products, and Harbor Fish Market. In recent months, Kasbay has begun to fillet groundfish for the wholesale market.

Offshore Fisheries

There are five large boats owned by Maine Fisheries Corporation, which spend most of their time far out in the Gulf of Maine fishing for redfish (ocean perch). All of these boats have steel hulls between 130 and 140 feet long and displace between 150 and 250 tons. They are all relatively old vessels, which were built in the late 1930's or late 1940's. The crews of these boats come mainly from the Portland area, although a few men live in other coastal towns in the central parts of the state. Crew size is six to ten.

There are three longliners which fish for swordfish. Two of the three are registered in Florida; the other is owned by Atlantic Shelf Corporation in Portland. All of these boats follow the swordfish over the annual migration route. Thus, they fish off Florida and the southern states in the winter, and off Maine and the Maritimes in the summer and fall. These boats only land their fish in Portland some four or five months a year. However, the captains of these boats, and most of the crew members are from the Portland area. Crews are usually five or six people.

There are also six other large boats (70 to 90 feet) which have the capacity to go offshore. Many spend most of their time in local waters harvesting groundfish although increasingly they are taking trips to distant areas of the Gulf of Maine. All of these boats sell their fish to Atlantic Seafood. These boats are privately owned, although two of the skippers of these boats are partners in the Atlantic Seafood Corporation.

Minor Fisheries

Marine worms. Virtually no local men dig marine worms. Periodically, a few men from Wiscasset dig worms in Back Bay.

Clams. No local men dig clams commercially, save for a small handful who go to Pine Point or the Harpswells on occasion. The local clam flats are badly polluted. Even clams dug at Pine Point have to be sold to a dealer with a depuration system.

Herring. Two Portland fishermen do some stop seining during the summer and early fall. One comes from Portland itself and combines lobstering, stop seining and gillnetting. The other comes from Chebeague Island and alternates between stop seining in the summer and lobstering at other times of the year.

Important Institutions Related to Fishing

Coastal Fisheries

Coastal Fisheries was established in 1952. The business occupies a small building on Brown's Wharf. In the past, Coastal Fisheries concentrated on shipping whiting and shrimp for the domestic and foreign markets. At present, the company deals only in groundfish and lobster. Lobsters they obtain from 20 local, privately-owned boats and from Canada. The company has tanks enough to hold 20,000 pounds of live lobsters, but over the course of the year they usually have no more than 10 to 12,000 pounds at any one time. The groundfish are obtained from five local boats, or are brought in from Canada or from the Boston market. Mr. Lewis, the owner, said that about 50% of all the fish they buy is supplied locally.

About 15% of the lobsters are sold locally. The rest are sold in the New York and Boston markets. All of the fish are filleted and sold in the fresh fish markets out-of-state. Within the state, Coastal Fisheries uses its own truck to transport its products. To ship out-of-state, they use Air Freight Service from the Portland Airport, or interstate trucking firms.

Coastal's dockside establishment is relatively small. The company does employ a few cutters to fillet fish, and has a small freezer to hold 3000 to 5000 pounds of fish. The company does not have tie-up facilities for the boats selling to it. While they supply lobstermen working "for them" with bait and gas, the bait is stored in a public cold storage plant.

Merrill Seafood

Merrill Seafood is located on Forest Avenue in Portland, about two miles away from the waterfront. Although the company operates out of a small building, it handles a large volume and great variety of fish. Most of their fish is sold to institutions.

Merrill Seafood obtains all of its fish from other wholesalers. None of their supply comes directly from fishermen. The fresh fish is bought mainly from R and S Seafood, Atlantic Seafood Company, and United Fish in Portland. The lobsters are bought from Coastal Fish and Sea Breeze in Portland. Periodically, they buy swordfish from companies on Cape Cod, and scallops in Rockland. Merrill imports fish from Iceland and Canada, and shrimp from the Gulf Coast. It also buys trout, salmon, halibut, and squid from suppliers on the West Coast. About 25 percent is fresh fish; the rest is frozen. The company has no large-scale freezing units at its own plant, but has 50,000 to 60,000 pounds of storage space available to them at the Northeast Cold Storage plant in Portland.

The company owns three refrigerated trucks which it uses to supply fish to schools, colleges, hospitals, and other institutions, as well as to numerous restaurants and supermarkets in central and southern Maine. The company markets as far west as Bridgeton, and as far north as Waterville.

Montebello Fish Company

Montebello Fish Company is a fish wholesaling and distributing firm that has been owned and operated by the same family for over 30 years. The company deals exclusively in fresh and frozen groundfish and lobster meat.

Montebello gets all of its supply of fish from dealers and wholesalers. A great deal comes from local wholesalers (R and S, United or Coastal). However, a high percentage comes from the Boston market or from Canadian suppliers. Exactly where the owner obtains his fish depends almost completely on price. The company has no permanent ties to any single supplier.

The company obtains most of its lobsters from Canada, although in the summer months, a great proportion are obtained from local Portland wholesalers or off the boats. The lobsters are then cooked, hand-picked, and sold either as fresh meat or frozen. The fish and lobster meat are then delivered in the company's two trucks to restaurants and institutions, primarily in the state of Maine. The company has a freezer capable of holding 500,000 pounds, and a relatively small cooler for fresh fish. Besides the owner, who is employed full-time, the company employs four other part-time people, including one part-time fish cutter.

New Meadows Lobster Pound

New Meadows Lobster Pound wholesales and retails only lobsters. The firm occupies two buildings on Portland Pier: one houses the firm's offices; the other is a storage shed for bait, and contains the firm's storage tanks which hold about 20,000 pounds of lobster. The company, despite its name, has no pound. It employs five or six full-time employees, and hires others during the busy summer months.

In the summer and fall, New Meadows buys most of its lobsters from a dealer in Bailey Island, who has about 40 men "fishing for him." It also obtains lobsters from seven local boats--all from Chebeague Island. The firm supplies these Chebeague boats with bait, etc., with the usual understanding that the firm will obtain their lobsters. In the winter months, about 90 percent of the lobster supply comes from Canadian pound operators.

Most of New Meadows' lobsters are sold out of state to buyers and markets throughout the United States and Europe, Japan, and, more recently, the Arab countries. These lobsters are transported by air freight from the Portland airport or by Americana Trucking. The company also sells to six large restaurants in the Portland area and to a few local fish markets, which they supply with their own truck.

Atlantic Seafood Products, Inc.

Atlantic Seafood specializes in wholesaling and retailing groundfish. The company was begun in 1978 by five local men: two groundfish boat skippers, and three other local businessmen. The corporation has an unloading facility on Central Wharf and a retail store and processing plant on Commercial Street in Portland, which contains a large freezer and cooler. It also owns or has equity in three of the largest groundfish boats working out of Portland, and regularly buys fish from four more owned by private operators. In addition, the corporation leases several trucks which it uses to distribute its own fish.

All told, the corporation employs 27 people: 15 men on the boats; five people in the office; three full-time and three part-time fish cutters; and one man who buys fish for the corporation on Central Wharf.

The corporation buys every kind of fish the boats are catching, and processes and fillets all of the groundfish itself. Some fish is sold fresh through their own retail store, but most is sold either fresh or frozen in other parts of Maine or shipped to the Boston and New York markets, or to Europe. The frozen fish sold in Maine is marketed under the company's brand name; the fish going to other markets is shipped in bulk with no brand name on it.

Most of the fish sold in their retail store is caught by their own boats and processed in their own plant. The species they do not catch themselves (e.g. lobsters, scallops, etc.) they buy either locally or in Boston.

In the future, the corporation would like to hire a redfish cutter and be able to process all the redfish their boats catch.

The company would also like to begin buying some lobsters from local boats, simply to satisfy local demand. They do not plan to add a bait facility, or to service a large number of lobster fishermen.

Old Port Clam Company

Old Port Clam Company was established in 1978, and does nothing but process and sell clams. The firm is located in a small building on Pleasant Street about two blocks from the waterfront. The company employs about ten people, including six shuckers.

All of the clams are purchased from some 30 clammers in the Machias area, and are hauled to Portland in two company-owned refrigerator trucks. About 50 percent of the clams are shucked; the rest are sold as steamers. Ninety percent of the clams are sold on the wholesale market and Willard and Daggett buys about 75 percent of these. The other 10 percent are sold retail.

Pioneer Fish Company

Pioneer Fish Company, which is located in a small building on Brown's Wharf, has perhaps the most unique operation in Portland. The company does nothing but process dogfish for the European market. While the company is only three years old, it appears to be doing reasonably well.

The company is operated by an Englishman and a German, and 10 other employees. The owners come to Portland during the season when dogfish are plentiful (i.e. May through November). During the winter months, they go back to England and Germany respectively, and spend their time selling their product. Most of the dogfish go to England to be made into fish and chips, but a fair proportion goes to Germany and the lowland countries.

All of the dogfish come from local, privately owned gillnetters. These boats primarily fish for groundfish, but inevitably have a large ancillary catch of dogfish, which they sell to Pioneer. During the height of the season (July to September), three of these local gillnetters fish primarily for dogfish.

When the fish are landed at Brown's Wharf, they are filleted by cutters who Pioneer itself has

trained. The fillets are then taken to Northeast Cold Storage, where they are frozen. The fish are shipped to Europe in 20 ton lots on freezer ships. During the height of the season, the company produces 40,000 pounds of fillets in a week or less. During the 1978 season, they shipped more than 1,000,000 pounds of dogfish to European markets.

R and S Seafood

R and S is one of the biggest fish wholesale firms in Portland. The firm is located in a relatively large building on Custom House Wharf which houses their offices, filleting facilities, and a cooler for 25,000 to 30,000 pounds of fish. All told, the firm employs eight cutters and a floor crew of nine. It owns no boats, trucks, or other capital. Its frozen fish is handled through Northeast Cold Storage.

R and S buys from some 25 local privately owned boats. Eight of these boats alternate between gillnetting and dragging; the rest use gillnets exclusively. Most of these boats are relatively small (45-55 feet) and employ three or four men in their crews. The company also obtains fish from other small dealers in the central part of the state.

A small part of R and S's output is wholesaled to local restaurants and dealers, but the greatest part is sold out of state. The bulk of their fish is sold in the Boston, New York, or Montreal markets, but wherever possible R and S is by-passing the markets and developing direct ties to buyers all over the continent. The firm is slowly developing a Midwestern market, and already ships fish to Arizona, Illinois, Nevada, and Wyoming. It also ships fish to Nova Scotia on the ferry.

R and S's fish is shipped to markets either via Americana Trucking Company, or in two trucks which the firm leases. At times, they also ship fish directly via air freight from the Boston Airport.

Sea Breeze Lobster Company

Sea Breeze Lobster Company shares a building with United Fish Company on Union Wharf. Most of the company's business comes from bulk shipment of lobsters. It is a medium sized company, employing some 15 to 20 people, depending on the season. About 60 percent of its lobster supply comes from Canada, the rest comes from 25 to 30 privately-owned local boats. While boats do not tie up at Union Wharf, Sea Breeze does obtain bait for these fishermen, with the usual understanding that they will sell their lobsters to them.

Sea Breeze stores the lobsters it buys in large storage tanks in its Union Wharf building. The lobsters are sold in Maine, other parts of the United States, and Europe. The company sends its lobsters to overseas and distant United States markets via air freight, while those destined for East Coast markets are generally transported by Americana Trucking Company. The company also leases a truck which it uses to supply Maine markets. The company has no retail operation, although it will sell lobsters to individual customers on request.

United Fish Company

United Fish Company is located on Union Wharf. The owner has been in the business for about 40 years, and his father was in it before him. United Fish handles only fresh fish for the wholesale market. For the most part, the fish they handle is not cleaned, but is shipped in the round to the New York and Boston market via Americana Trucking Company. United Fish owns a holding cooler for about 35,000 pounds, and employs 10 people, none of whom are hired to cut fish.

The owner buys from twelve small local boats: eight gillnetters and four draggers. Even though these boats are privately owned, they all have strong ties to United Fish, and sell exclusively to this company except under unusual circumstances. All of the boats "fishing for" United are relatively small (40 to 80 feet), and concentrate on catching high-priced groundfish (i.e. cod, haddock, flounder, hake, and pollock) in waters relatively near Portland throughout the year.

Willard and Daggett

Willard and Daggett is one of the oldest and largest firms dealing in fish in the Portland area. The firm has a large building on Central Wharf. In the recent past, the company owned seven beam trawlers, but they were not replaced when they became old and were retired. At present, the company concentrates on packaging and selling groundfish to food stores under the "Silver Bay" brand. They also handle some fresh crabmeat and lobster. Willard and Daggett obtains about 60 percent of the fish it uses from Portland. About 15 privately owned local boats sell their fish to Willard and Daggett, and the company also buys some fish from other local wholesalers. The rest comes from Canadian sources. At present, local boats land fish destined for Willard and Daggett at Central Wharf. The Canadian fish comes to Portland on trucks, some of which come over the road through New Brunswick and others which arrive on the ferry from Yarmouth, Nova Scotia. The crabmeat and lobster are all obtained from other local dealers.

Willard and Daggett employs about eight cutters and ten other workers to process the fish it buys. All of this fish is sold--either fresh or frozen--in stores throughout Maine, New Hampshire and Vermont. The company transports all its own fish in its own trucks. The fish racks and other garbage are sold to the fish meal plant in South Portland.

White Water Co-op

White Water Co-op was a cooperative of lobster fishermen located in a large building on Central Wharf. It is now defunct and Lusty Lobster Company of Bremen, Maine is now operating a lobster dock in this location.

The Lobster Cooperative was formed in 1976. In 1978, it had 18 members, only three of whom were full-time fishermen. Most of the members came from the islands in Casco Bay, and not Portland itself.

The co-op had very few assets. It leased the building it occupied which contained holding tanks for 25,000 lbs. of lobster. It had no wharf or trucks.

The cooperative operated like most in the state. It provided bait, wharfage, and a marketing outlet for the lobsters its members caught. Like all other co-ops, it paid its members the current price for lobsters and a bonus at the end of the year. To join the cooperative members had to buy a share which cost \$800.00. On a day to day basis, it was run by a hired manager. The cooperative had an elected President, Vice-President, Secretary and Treasurer, who made most policy decisions.

Maine Fishermen's Cooperative Association

The Maine Fishermen's Cooperative Association is an industry grouping whose most important purpose is to lobby for the interests of fishermen. While association membership is open to all fishermen in Maine, the vast majority of its members are fin fishermen from the southern and central part of the coast. A very large number of its members come from Portland and surrounding towns. The Association has 15 executive members: 4 officers and 11 directors. In 1977, the Association hired an executive director to: lobby for the Association, represent its interests with state and Federal agencies, and inform members of pending governmental action. By 1978, most of the members had come to depend on the Executive Director to further their interests, while they attended to their own fishing businesses. The first executive director was Norm Olsen, who was very active in furthering the cause of the Association through his membership on the New England Regional Fisheries Management Council. The job was then taken over by Ron Hurd and more recently by Ed Bradley.

The Maine Fishermen's Cooperative Association is currently having a good deal of success, which is reflected in a growth of membership. The Association was begun in the late 1960's with 70 members. It was incorporated in 1971, and now has some 250 members who come from Rye Beach, New Hampshire to Stonington, Maine.

Maine Fishermen's Wives Association

The Fishermen's Wives Association was formed in 1977 to lobby for the interest of the fishing industry. While membership is technically open to anyone, male or female, the membership is made up almost completely of the wives of owners of highline groundfish boats in the Portland area. At present, the Association has about 40 members, but only 12 to 15 can be considered to be active. The Association has been far more effective than numbers alone would suggest. These women meet once a month in homes of various members to discuss recent Federal actions pertaining to the industry, and positions they might take to further their cause. During 1978, they worked closely with the executive director of the Maine Fishermen's Cooperative Association to influence the public and officials on matters concerning the industry, especially issues stemming from Federal efforts to manage the groundfisheries of the Gulf of Maine.



SOUTH PORTLAND

Physical Setting and Population

South Portland lies across the Fore River from Portland. It is a highly industrial city, with a population of 23,267. Very little fishing is done in South Portland, but the city is one of the largest oil importing ports on the East coast of the United States. South Portland's anchorages are the same as Portland's: the Fore River serves as the inner harbor, while part of Casco Bay behind the islands serves as the outer harbor for large, ocean-going vessels.

Major Industries and Economic Pursuits

The largest industrial employers in South Portland are: Fairchild Semiconductor which employs up to 2500; Bancroft and Martin, Inc. (structural steel), employing up to 300 workers; General Electric with 600 to 700 workers; Rockwood Systems Corporation (fire-fighting equipment) with 100 employees; King Cole Foods, Inc. with about 100 employees; and Pine State Byproducts (fish meal), which will be discussed below. There are several tank farms and pumping stations in South Portland, located along the waterfront. The oil that is landed at South Portland is stored in the local tank farms, and a large proportion of it is transported to Montreal via a pipeline. The Maine Mall, one of the largest shopping plazas in northern New England, is located in the outskirts of South Portland, close to the Portland Airport and Interstate 95. The employees operating all these facilities come from all over the Portland area--not just from South Portland itself.

General Infrastructure

South Portland is well served with transportation facilities. U. S. 1 and Interstate 95, linking southern New England and northern Maine go through South Portland. The Portland International Airport is close by. Three railroads maintain tracks going through South Portland. None of these railroads carry passengers any longer, but the trains do serve South Portland's industrial plants. In addition, the Southern Maine Vocational Technical Institute is located in South Portland, and is the largest unit in the State Vocational Technical System.

Port Infrastructure

The South Portland waterfront is dominated by oil tank farms, and their accompanying docks and oil pumping facilities. The following companies have facilities in South Portland: Mobil Oil Corporation, American Oil Corporation, Texas Oil Corporation, Northeast Petroleum, Chevron, Webber Petroleum, and the Portland Pipeline Corporation. Texas Oil Company, Mobil Oil, and Portland Pipeline Corporation operate huge docks capable of unloading oil from large oil tankers. The smallest of these docks is 300 feet; the largest is 975 feet long. Bancroft and Martin Company also owns a large pier which they use to unload steel, and the Vocational Technical Institute has a small pier which they use to tie up their research vessels. The U. S. Coast Guard also has a base in South Portland. Central Maine Power Company has an installation close to the Portland bridge, and the city also maintains a very large sewage treatment plant in the upper harbor. The Greater Portland Division Corporation (manufacturing) occupies the 39 buildings vacated by the now defunct South Portland Shipyard.

The South Portland Shipyard and Marine railway has a large facility on the Fore River. There are also four marinas in South Portland: Wakely Landing, Port Harbor Marina, Center Board Yacht Club, and Hockamock Boat Yard and Marina. These marinas do most of their business with the pleasure boats, but they do supply gas and mooring spaces for the few lobster boats operating out of South Portland.

Types of Fishing

In South Portland there are only a few lobster boats operating. However, many men from the city work on Portland's fishing boats. In addition, Pine State Byproducts operates a large fish meal plant in South Portland, although the fish used in the plant comes from boats located in other ports in Maine and New England.

Lobster

1. Number of Boats, People, and Fishing Areas

Only five or six lobster boats are moored on the South Portland side of the Fore River. In the summer a few part-time fishermen moor their boats off Willard Beach, in the outer harbor. Some of the lobster boats owned by full-time South Portland fishermen are moored on the Portland side of the river and operate out of Portland. These South Portland fishermen do not have a distinct lobster fishing area, but rather fish an area also exploited by Portland boats. All of these boats are relatively small (32 to 35 feet), and their owners fish alone using relatively small gangs of traps.

2. Marketing

There are no lobster buyers or dealers operating on the South Portland side of the Fore River. All of the lobsters caught by these South Portland men are sold to dealers in Portland, with whom the fisherman has a semi-permanent marketing arrangement. A fisherman normally obtains bait from the dealer where he sells his lobsters, but buys his gas and moors his boat at marinas on the South Portland side of the river.

3. Processing

No lobsters are processed in South Portland.

Important Institutions Related to Fishing

Pine State Byproducts, Inc.

Pine State Byproducts operates a fish meal plant located in the South Portland Industrial Park across the Fore River from the Maine State Pier in Portland. The company's plant is relatively large, highly automated, and employs 110 people. The plant makes a variety of products from the refuse from fish and animal processing plants. It renders hog bristles which are used by Mearl Corporation of Eastport. It grinds up fish or fish remnants from local fish plants and restaurants and makes animal feed. The plant is a major supplier of chicken feed for Maine's chicken industry, and supplies feed to the following chicken raising firms: Penobscot, Maplewood, Lipman, Fort Halifax, and Decosta.

Some of the raw fish comes from the Portland area itself, but most of it comes from Point Judith, Rhode Island and is brought to the plant in trucks owned by the company. The plant also owns a 113 foot carrier vessel, but rarely uses it now.

Stauffer Chemical

This company operates a carrageenan manufacturing plant in the South Portland Industrial Park. This plant was constructed in 1951, and employs some 45 people who operate the highly automated plant in two shifts. Virtually all of the sea moss used in this plant is imported from Nova Scotia, Prince Edward Island, the Phillipines, etc. The company does have two sea moss buyers in Maine: one in Kennebunk, and the other in Harpswell. Most of the carrageenan manufactured by this firm is sold to companies manufacturing dairy products.

U. S. Coast Guard Station

The base along the South Portland waterfront is the headquarters for one of the four U.S.C.G. Groups in the First Coast Guard District. This group covers the area from Port Clyde, Maine to Rye Beach, New Hampshire. Under this group are three Search and Rescue Stations: Boothbay Harbor, Portsmouth, New Hampshire, and another at South Portland itself.

Stationed at the South Portland base are a Search and Rescue unit with about 27 men who operate a 44 foot lifeboat, a 41 foot utility boat, and a 21 foot high speed outboard. There is also an Aids to Navigation Unit, which handles repairs to buoys, lighthouses, etc. The Group also has control over two large vessels: the "Yankton," a 110 foot tugboat, and the "Shackle," a 65 foot tug.

Two large cutters are stationed at the Portland State Pier: the "Duane," a 327 foot boat with a 110 man crew, and the "Spar," with a 50 man crew. Both of these large vessels are employed in enforcing the 200 mile fisheries zone and are under the direct command of the Admiral in charge of the district in Boston.

South Portland Shipyard and Marine Railway Company

This company operates a large ship repair facility, located along the inner harbor, which employs about 25 people. The company has a moderate-sized wooden wharf for docking and repairing ships. It also has three marine railways: one with a capacity of 1200 tons, one with a 150 ton capacity, and the third capable of holding only 25 tons. The company has a machine shop, a barge used for diving operations, and a small tugboat.

D. and G. Machine Products, Incorporated

This company employs about 25 people who do welding, sandblasting and machine repair work. Much of their effort is devoted to ship repair. The company has a small dock but no marine railway.

CAPE ELIZABETH

Physical Setting and Population

Cape Elizabeth is a suburb south of Portland. It is a very wealthy bedroom community of 7873 people.

Major Industries and Economic Pursuits

Virtually all adults with jobs in Cape Elizabeth work in Portland or other nearby towns. The town has no heavy industry and very little fishing.

General Infrastructure

The town has no major transportation facilities and can only be reached by private automobile. The most notable structures in the community are the Portland Head Light, and Two Lights Light-house. Both guide ships into Portland Harbor, and are famous tourist attractions.

Port Infrastructure

There are no good harbors in Cape Elizabeth. Several small boats are moored at Kettle Cove year round, and some 13 or 14 during the summer. During the summer months a few lobster boats are kept in an inlet near Two Lights. Both anchorages are very exposed. The one near Two Lights is unusable in the winter. Neither cove has a dock, so that fishermen must transport everything to and from their boats over the beach.

Types of Fishing

Lobster

1. Number of Boats, People, and Fishing Areas

There are 13 or 14 lobster boats operating out of Cape Elizabeth at the height of the summer season. Only four or five of these men go lobstering year round.

2. Marketing

There are no lobster buyers in Cape Elizabeth. Local fishermen truck their own lobsters to wholesalers in Portland. One local fisherman sells part of his catch through Cape Shore Variety, a store run by his wife.

3. Processing

None.

Herring

1. Number of Boats, People, and Fishing Areas

In the recent past, one man operated a stop seine for herring at Kettle Cove and fished for lobster as well. He still has his seine and other fishing equipment, but now works for a tow boat full time.

2. Marketing

None sold recently.

3. Processing

None.

Groundfish

1. Number of Boats, People, and Fishing Areas

Four local lobstermen, in recent years, have gone dragging for groundfish in the spring of the year. (They return to lobstering in the summer and spring.) These are the only groundfish caught by Cape Elizabeth boats.

2. Marketing

These fish are transported to Portland and sold to local wholesalers and dealers there.

3. Processing

No local groundfish processing, save for Cape Shore Variety (retail store).

Minor Fisheries

One lobster fisherman operates a fish trap. A large proportion of the fish are frozen and sold to Portland boats as swordfish bait.

Important Institutions Related to Fishing

Cape Shore Variety--Fish Market

Cape Shore Variety is a small convenience store combined with a fish market operated by the Kelly family. The store is tended by Mrs. Kelly; Mr. Kelly devotes most of his time to operating his lobster boat, dragger, and fish trucking firm. The family boats supply all of the fish sold to the market; the surplus fish are filleted and sold on the Boston market.

Important Institutions Related to Fishing

Bayley's Lobster Pound

Bayley's Lobster Pound is located in a small building on the main street of Pine Point. The building houses a depuration plant for clams, lobster tanks, and a small takeout restaurant. The firm owns no pound or dock, so that all fishermen dealing with the firm must transport their own fish over the road. Bayley buys his lobsters from six local fishermen who deal to him exclusively and from dealers in Boothbay and Bailey Island. He obtains his clams from 35 to 50 local diggers. Most of the lobsters and clams he sells to tourists or local people through his retail outlet.

Dave Thurlow

Thurlow's establishment consists of a large building on the lagoon side of Pine Point. It houses a set of lobster tanks (cap. 4000) and a clam depuration plant. The firm owns no dock. Thurlow obtains lobsters from seven or eight fishermen who sell to him exclusively. The clams are also supplied by local diggers. All of Thurlow's lobsters and clams are sold wholesale to local restaurants. Ninety percent of the fish are sold within 12 miles of Pine Point.

Snow's Food Products

Snow's Food Products plant is about one mile from the beach. The firm manufactures clam chowder, seafood chowder, fish chowder, corn chowder and oyster stew. These canned soups are marketed nationally. When the company opened in the 1950's, the clams and seafood were obtained locally. At present, the company is importing surf clams, primarily from New Jersey; the fish is bought in Gloucester; and the oysters are purchased in Japan and in Korea. At the height of the season, the plant employs about 200 people from Scarborough, Old Orchard, and Biddeford.

Pine Point Fishermen's Cooperative

Pine Point has a fishermen's cooperative which has a building containing its holding tanks (capacity 15,000 lbs.) and a small restaurant near the Pine Point town landing. Its members use the nearby town wharf. At present, the co-op has eight members, but other part-time and full-time fishermen sell their lobsters to the co-op as well. The co-op supplies bait to its members, as well as to any other fishermen who sell to it regularly. The co-op has one truck which it uses to transport lobsters to local restaurants. It also air freights lobsters all over the United States, and sells lobsters to dealers in other eastern states.

Paul F. Bayley, Inc.

Paul F. Bayley, Inc. is located on the Pine Point Road, away from the beach. This firm processes and distributes clams, scallops, groundfish, and in the past has processed shrimp. Clams are presently the mainstay of the business. The firm purchases all its clams from diggers in the central and eastern parts of Maine, where clams are more plentiful and depuration is usually not necessary. The clams are brought to the small plant in Pine Point where a high proportion of them are shucked by eight women and sold to restaurants to be served as fried clams. The groundfish are obtained from wholesalers in Portland. The firm owns two trucks, which it uses to distribute its products to restaurants in Maine and other New England states. Clams and other products destined for other areas of the United States are shipped by Americana Transport out of Portland.

Distinctive and Unusual Aspects of the Harbor

Pine Point fishermen themselves concentrate only on lobsters and clams. However, the town contains two firms which import large quantities of clams, fish, etc. from Maine and other states, process it, and ship it out again. It is thus as much of a processing center as a fishing port, and one which uses fish bought outside the local area.

CAMP ELLIS AND BIDDEFORD POOL

Physical Setting and Population

Camp Ellis is located on the north bank of the Saco River at its mouth. Its harbor facilities are just inside the river mouth. Biddeford Pool is on a peninsula just south of the river mouth, jutting out about a mile from the rest of the shoreline. By water the two locations are about two miles apart. By land it is a 15 mile drive between them because the first bridge across the river is between the communities of Biddeford and Saco about seven miles inland. Biddeford Pool is part of the city of Biddeford which has a population of 19,983 and Camp Ellis is part of Saco with a population of 11,678 (1970 U. S. Census). Neither Biddeford Pool nor Camp Ellis is differentiated in census figures but both are small communities with an estimated 600 to 700 people each.

Although discrete communities, they are being treated together because they are both part of the Biddeford-Saco area and are influenced by essentially the same forces. What applies to one generally applies to both.

Major Industries and Economic Pursuits

Both communities are within easy commuting distance of the commercial and manufacturing center of Biddeford-Saco. A large portion of the populations in both communities commute to work in this center, which gives both settlements "bedroom community" characters. Neither has more than a couple of small stores and seasonal, tourist-oriented shops.

The influence of the tourist industry is notable in both locations. Both are on the fringe of areas of heavy commercial tourist development. The coast in both areas is crowded with seasonal dwellings. Fishing is of minor importance.

General Infrastructure

Camp Ellis has a well-equipped town dock and launching ramp. It also has a paved launching ramp adjacent to it which is suitable for small boats. This dock is used by both fishermen and pleasure boaters, and is the primary harbor facility in the area. The moorage area is located just inside the mouth of the Saco River on its north bank, and is made usable by long rock jetties extending from the river mouth.

The same jetties improve the harbor area of Biddeford Pool. A series of small islands provide additional protection from the sea in the moorage area formed between the jetties and the point on which the community is located.

The only facility at Biddeford Pool that can be used by fishermen is a small yacht club. There is also a city launching ramp in an unusable state of disrepair. There is a state boat launching facility suitable for small boats on the Biddeford (south) side of the river about five miles from Biddeford Pool. There are, however, several facilities catering to the pleasure boat trade, including Rummy's Boatyard in Biddeford, the Yacht Club, and Marston's Marina. There are far more pleasure boats and sports fishing boats in the area than fishing boats.

Types of Fishing

The primary fishery in both harbors is lobstering. The harbors have six groundfish boats between them.

Lobster

1. Number of Boats, People, and Fishing Areas

There are 15 lobster fishermen in Biddeford Pool and some 35 in Camp Ellis. About a dozen

in each harbor use specialized lobster boats, with the rest operating from skiffs. Most of these fishermen operate alone.

2. Marketing

An indeterminate number of lobsters are sold to dealers in Portland, especially Coastal Seafoods. About 12 to 15 local fishermen regularly sell to Norwood's Lobster Pound. Local lobstermen also sell their catches to the Pine Point Lobsterman's Cooperative and Dave Thurlow in Pine Point.

3. Processing

No processing is done locally.

Groundfish

1. Number of Boats, People, and Fishing Areas

Camp Ellis has four boats: one gillnets exclusively; two combine gillnetting and lobstering; the last combines gillnetting and dragging. Biddeford Pool has two craft (42 feet and 55 feet) otter trawling with two man crews. The 55 foot boat is also used for some party boat fishing in the summers.

2. Marketing

The groundfishermen send their catches to the Boston market through the Thompson-Nagle shipper and broker combination utilized in Cape Porpoise and Kennebunkport (see Cape Porpoise).

3. Processing

No local processing is done.

CAPE PORPOISE

Physical Setting and Population

Cape Porpoise is located about two miles northeast of Kennebunkport and is part of the town of Kennebunkport. Cape Porpoise harbor is reached through a dredged channel leading in from the sea. The main population concentration of the area is located roughly one-fourth of a mile inland from the harbor.

Kennebunkport has a population of 2160 (1970 U. S. Census). Cape Porpoise is not differentiated from the rest of the town, but probably has a population of around 500.

Major Industries and Economic Pursuits

Cape Porpoise almost seems to be a pocket of calm in the highly developed tourist area surrounding it. Tourists flock to the community, but it lacks the massive buildup of shops, motels, and restaurants to be found only two miles down the road in Kennebunkport or a few miles inland along route #1. The coastline of the entire area is crowded with seasonal homes, however.

A large portion of the local population, if not employed in nearby tourist-related jobs, commutes to jobs in the Biddeford-Saco or Portland areas.

Cape Porpoise and Kennebunkport constitute one of the largest gillnetting areas in the state of Maine.

General Infrastructure

Cape Porpoise is served by highway #9. The major portion of the town's businesses are situated along route #9, the most important of those being a supermarket, hardware store, gas station and restaurant. The area has numerous seasonally occupied homes, but is relatively lacking in tourist developments.

The major shopping and service centers for the area are Biddeford, Saco and Portland.

Port Infrastructure

Cape Porpoise has a large cove with moorage space for numerous boats. The narrow entrance channel to the harbor must be maintained by periodic dredging. Except for a few private docks, Cape Porpoise has only one wharf facility, owned by the Cape Porpoise Pier Corporation. The town of Kennebunkport pays the corporation a fee to obtain access rights to the facility. Commercial fishermen make arrangements individually, and generally pay a fee of one-fourth of a cent per pound for handling fish over the dock.

Types of Fishing

The most important fishery in Cape Porpoise is lobstering. Groundfishing is second by a wide margin, and is the only other significant fishery.

Lobster

1. Number of Boats, People, and Fishing Areas

The harbor has around 75 lobster fishermen during the summer. Of these, roughly half are full-time fishermen. The remainder are primarily youngsters and hobbyists with skiffs. Precise figures on the number of boats are unavailable. There are an estimated 35 specialized lobster boats with inboard engines regularly moored in the harbor.

2. Marketing

Cape Porpoise has six lobster buyers. These are all relatively small operations. Most are also seasonal. With one exception, they operate from small floats anchored in the harbor. Their holding facilities (lobster cars) are incorporated into the floats. The floats also have small buildings on top of them to afford protection from the weather and for storage. The exception is the Cape Porpoise Pier Corporation, which conducts its business from the wharf. It is the only fuel supplier.

Lobsters are resold in a variety of ways. Some go to wholesale buyers, while a significant portion are sold to local outlets such as restaurants, particularly during the tourist season. The different lobster buyers have their individual local clienteles.

3. Processing

No local processing is done.

Groundfish

1. Number of Boats, People, and Fishing Areas

There are five groundfishing boats at Cape Porpoise. All are between 34 feet and 47 feet in length. Three are used exclusively in gillnetting. One combines gillnetting and lobstering, and the last is used for otter trawling. The gillnetters have crews of three to four and the dragger has two. In the winter two gillnetters (38 and 42 feet) have been fishing out of Cape Porpoise harbor for three months.

2. Marketing

The fish landed at Cape Porpoise go to the Boston market by the usual trucker to broker arrangement. Sherman Thompson (Denise Dee) provides the shipping service. Once the fish arrive in Boston, John Nagle, a broker, takes over and sells them. The fisherman then receives a check for his catch, from which the broker has already subtracted the shipper's fee.

Important Institutions Related to Fishing

Denise Dee Corporation

This company, owned by Sherman Thompson of Cape Porpoise, is the largest over-the-road groundfish shipper from Maine to Boston. The company has five trucks and as many as 40 employees at the height of the season. At present, the company currently hauls fish from: New Harbor, South Bristol, Camp Ellis, Biddeford Pool, Cape Porpoise, Kennebunkport, Perkins Cove, and York. Most of these fish are currently sold through John Nagle, a broker in Boston.

KENNEBUNKPORT

Physical Setting and Population

Kennebunkport is located at the mouth of the Kennebunk River roughly 25 miles north of Kittery at Maine's southern border. Anchorage is in a developed segment of the river.

The town of Kennebunkport includes an area extending several miles around the community of Kennebunkport. The town has a population of 2160 (1970 U. S. Census), with the major portion of this population centered in the settlement of Kennebunkport.

Major Industries and Economic Pursuits

Kennebunkport is first and foremost a tourist center. Tourism is its primary industry, and almost all businesses are oriented toward it. The community has numerous small seasonal shops, plus motels, marinas, restaurants and yacht clubs.

Many of those not involved in some aspect of the tourist industry commute to jobs in the Kittery-Portsmouth, Biddeford-Saco, and Portland areas. Fishing is a comparatively minor pursuit.

General Infrastructure

Highways #9 and #9A/35 serve Kennebunkport. The community's businesses are located primarily along the main highways and the streets along the river. The community offers most goods and services a shopper could desire, but the emphasis is on the tourist market. Seasonal specialty and souvenir shops abound. For local residents, the Biddeford-Saco area offers better selections of everyday items at better prices. In addition, Portland is close enough to encourage frequent visits.

Port Infrastructure

Kennebunkport is an unusual harbor in that moorage areas have been artificially created by dredging anchorage basins in the Kennebunk River. The narrow navigation channel is also maintained by dredging. A breakwater protects the mouth of the river. In all, roughly half a mile of the river course is maintained.

The Kennebunk town dock (locally referred to as Government Wharf) is the only public facility in Kennebunkport, and is the focus of commercial fishing. In addition there are two marinas, two yacht clubs, and two boat yards. All of these are oriented toward the pleasure boat market. There are also two charter fishing operations for tourists run during the summer. An assortment of restaurants, motels, a beach club, and a condominium are also located along the river. The coast along either side of the river mouth is very heavily developed with elaborate vacation homes.

In the summer when many pleasure boats are present, the area is extremely congested. Fishing boats simply have to make the best of the situation and find mooring where they can. The only facility readily available for their use is Government Wharf. This is little more than a place to load and unload materials and a place where vehicles may be parked.

Given the congestion and lack of facilities, it is remarkable that Kennebunkport has any fishermen at all. It is even more remarkable that it has one of the largest concentrations of gillnetters in the state. The fleet is relatively new, with gillnetting beginning in the area during the early 1970's.

Types of Fishing

Groundfish is the biggest fishery in Kennebunkport. Lobstering is the only other commercial fishery. We include the two seasonal charter boat operations with the tourist industry rather

than with commercial fishing.

Groundfish

1. Number of Boats, People, and Fishing Areas

Eight boats (36 feet to 55 feet) gillnet and two boats (46 feet and 50 feet) otter trawl from Kennebunkport. The otter trawlers employ two man crews, while the gillnetters employ three or four.

2. Marketing

Fish are marketed through the same Thompson and Nagle shipper/broker combination described for Cape Porpoise. Fish are shipped by Thompson to Nagle in Boston who attends to their sale. Since gillnetting is the predominant fishing technique, species living off the bottom (cod, haddock, hake, etc.) rather than bottom dwelling species (flounders) compose the biggest portion of landings. The two otter trawlers of course bring in some flounder.

3. Processing

No processing is done locally.

Lobster

1. Number of Boats, People, and Fishing Areas

Kennebunkport has between 15 and 20 lobster fishermen, all of whom are full-time except five or six.

2. Marketing

The largest dealer in the Kennebunkport area is the Port Lobster Company which regularly buys from 16 fishermen. Another six fishermen regularly sell to Schackford and Gooch, a fish market in Kennebunkport. In the near future, another fish store is scheduled to open and will ostensibly buy lobsters.

3. Processing

None.

PERKINS COVE AND WELLS HARBOR

Physical Setting and Population

Perkins Cove and Wells Harbor are in the town of Wells, about 18 miles north of Kittery and Portsmouth, and about 28 miles south of Portland. Perkins Cove is near the hamlet of Ogunquit, in the southern part of the township. Wells Harbor is located approximately five miles to the north, near the northern border of the town. In between is a series of beaches: Ogunquit Beach, Moody Beach, and Wells Beach. Since Wells is a resort town, the population of the township fluctuates radically over the annual cycle. The permanent population is only 2099, but in the summer the population of the town is estimated at 9000 or more as summer cottages are occupied and the scores of motels are filled with transient tourists.

Major Industries and Economic Pursuits

Tourism is clearly the major industry in Wells. There are dozens of restaurants, motels, and hotels catering to transient tourists. The largest concentrations of tourist places are in the hamlet of Ogunquit and at Wells Beach, where there are whole blocks of shops, restaurants, motels, etc. U. S. 1 in the town of Wells is lined with similar establishments. There are a few inexpensive restaurants and motels, but the vast majority clearly cater to a well-heeled crowd. The whole tenor of the place is reflected in the fact that some of the chief attractions of the area are the Ogunquit Summer Playhouse and the expensive antique shops.

There are no industrial plants of any kind in Wells. In the winter, when the tourists leave, Wells is a very quiet place. Some local residents work at the Portsmouth Naval Shipyard, and still others go to Sanford or Berwick to work in the shoe plants.

General Infrastructure

Interstate 95 and U. S. 1 run through the town of Wells, a mile or two back from the beach itself. The main line of the Boston and Maine Railroad runs through the town as well, but there is no station and no trains stop there. In the hamlets of Ogunquit and Wells Beach, there are clusters of establishments serving the tourist population. However, there are only a few food stores, shops, etc. serving the permanent population, and very few professional offices. The permanent residents do much of their shopping and obtain most services in either Portsmouth to the south or Portland to the north.

Port Infrastructure

Perkins Cove is one of the smallest, most crowded harbors on the entire coast of Maine. The entire anchorage area is perhaps only 300 yards long and about 100 yards wide. It is entered by a very narrow channel about one-fourth of a mile from open ocean. The entrance to the harbor is crossed by a footbridge, with a clearance of 16 feet and a channel width of 20 feet. The bridge and channel itself make it impossible for large boats to enter the harbor. In the harbor there are spaces for approximately 60 to 70 boats. There are spaces for 36 small boats on a series of wharfs maintained by the town at the back of the harbor, and approximately 30 moorings in the harbor itself. There are no more moorings available at present. Mooring spaces are allocated by the town harbor master. When moorings become available commercial fishing vessels get first preference. A relatively high mooring fee is charged by the town. As a result, Perkins Cove is dominated by commercial fishing boats and a few excursion boats--not yachts. Fishermen use the town dock on the west side of the harbor, which has a small hoist, a shed for bait barrels, and tanks for fuel.

Perkins Cove is surrounded by establishments catering to tourists. On the east, there is a small spit of land, separating the anchorage from the Atlantic Ocean, which contains a large town parking lot and a cluster of small weather beaten shops, restaurants, and excursion boat floats. On the west side are two large modern motel complexes.

Wells Harbor, by the way of contrast, is a large lagoon area (called the Webhannet River) located between Wells Beach and a marsh on the mainland. It is entered through a very narrow channel between Drake's Island Beach on the north, and Wells Beach on the south. Although this anchorage is over a mile long, it is one of the worst anchorages on the coast due to silting. At low tide, much of the anchorage drains completely, and the entrance is so shallow that it may only be entered safely by an outboard-powered skiff piloted by someone thoroughly familiar with the intricacies of the harbor. As a result, very few commercial boats use Wells Harbor. There is a town launching ramp at the northern end of Wells Beach. Inside the harbor itself, there is a wharf with a launching ramp maintained by the town. Next to the town wharf is the Wells Harbor Marina with a marine railway, fuel and marine supplies, catering to the recreational boating trade.

Types of Fishing

Lobster

1. Number of Boats, People, and Fishing Areas

In Perkins Cove there are 17 inboard-powered lobster boats, operated generally by one man. There are no skiff fishermen in this harbor due to the high price of mooring space. Lobster fishermen from Perkins Cove range relatively widely, and at certain times of the year set traps around the Isle of Shoals.

In the summer, there are approximately 11 men fishing for lobster from Wells, but the vast majority of them are part-time skiff fishermen. In Wells Harbor, there are only three lobster fishermen who can be considered full-time. In the harbor, there are only three inboard-powered, standard lobster boats. Two of the full-time fishermen, however, use large skiffs (21 feet) in order to be able to enter and leave the harbor at low tide.

2. Marketing

There is no lobster dealer in Wells Beach or Perkins Cove. Most of the Perkins Cove fishermen sell their lobsters to dealers in the Portsmouth area or in Portland. The Wells Harbor fishermen sell their catches either directly to local restaurants or to the Wells Beach Lobster Pound, a retail fish market in the built-up section of Wells Beach itself.

At Perkins Cove, fishermen obtain their bait from dealers in Portsmouth or at Maine Commercial Bait in Portland. They arrange to have their own gas delivered to the town dock. At Wells Harbor, fishermen obtain gas at the local marina, and generally either catch their own bait or obtain it from dealers in Portland or Portsmouth.

Processing

Wells Beach Lobster Pound, a retail store, shells a good many of the lobsters it buys and sells the lobster meat.

Groundfish

1. Number of Boats, People, and Fishing Areas

There are five small draggers fishing from Perkins Cove. All of them are in the 38 to 42 foot range and have two-man crews. Much of their fishing is done around Jeffrey's Ledge and Basin. There are no groundfish boats at Wells Harbor.

2. Marketing

At present, the groundfish from Perkins Cove are picked up by one of the fish truckers, currently Denise Dee Corporation, and trucked to Boston where they are sold through a broker. A small amount are sold to local restaurants and fish markets.

3. Processing

Some of the local fish markets fillet the fish they buy to be sold in their own stores. However, there is no large-scale fish processing plant in Wells.

YORK HARBOR AND CAPE NEDDICK RIVER

Physical Setting and Population

The town of York is located in the southernmost region of the Maine coast, about five or six miles north of Kittery, Maine and the New Hampshire border. There are three population centers in the town: (1) York Village, an old and wealthy village on York Harbor, (2) York Beach, devoted to the tourist trade, and (3) Cape Neddick, a small rural hamlet on the shore in the northern part of the town. The only two anchorages in the town are at York Village and in the Cape Neddick River.

The permanent population of York is 5690, the largest concentration being at York Harbor. In the summer, the population grows greatly with the influx of "cottagers" and transient tourists. This is particularly true of York Beach which has a large number of motels and cottages.

Major Industries and Economic Pursuits

Tourism is the major industry in York. There are a dozen motels and restaurants at York Beach and in York Village itself. There are no industrial plants of any kind in York. The town also has a large number of retirees. In recent years, a very large number of middle class and professional people have moved into York, and commute from there to Portsmouth, northern Massachusetts, and even Boston to work. York is only an hour and ten minutes from the Mystic River Bridge in Boston. In this sense, it is fast becoming an expensive bedroom community for the heavily industrialized northern Massachusetts and southern New Hampshire area.

General Infrastructure

Highway U. S. 1 goes through the town of York, along with Interstate 95. No other transportation facilities exist. There are no notable industrial or governmental installations of any kind. There are also very few stores in the towns and no concentration of professionals. People from York do most of their shopping, etc. in Portsmouth to the south.

Port Infrastructure

The major anchorage in the township is York Harbor, a very well-protected harbor in the mouth of the York River. The anchorage is protected from open ocean by Stage Neck, which juts out into the river at its mouth. York Harbor is dominated by recreational boating. There are over 200 moorings in the harbor, virtually all of which are used by pleasure boats. On Stage Neck is the Agamenticus Yacht Club which has a club house, large parking lot and a set of private floats for use by its members. On the opposite shore is the York Harbor Marine Service, a large marina with full service facilities for the pleasure boat trade and a marine railway and storage yard. There are two town landings with timber wharfs. However, there are no wharfs or docks of adequate size which can be used by fishermen on a permanent basis. Several of the fishermen have erected make-shift floating catwalks from the shore which they use to get to their boats. On the north side of the harbor is the village of York itself with clusters of expensive homes.

The anchorage of Cape Neddick Harbor is in the mouth of the Cape Neddick River about half a mile from open ocean. The harbor is very narrow and shallow, and there are no facilities for boats at all. Fishermen are allowed to park their cars and beach their boats and skiffs behind the Cape Neddick Lobster Pound, a seafood restaurant on the shore of the river.

Types of Fishing

Fishing is not an important activity in the York area. Lobstering is the most important fishing activity, although there are a few groundfish boats as well. There is no herring fishing, nor any clamming or worming in the area.

Lobster

1. Number of Boats, People, and Fishing Areas

In York Harbor, there are 12 full-time lobster fishermen who have standard, inboard-powered lobster boats, and some 10 part-time skiff fishermen.

In the Cape Neddick River, there are nine fishermen all told. Two or three have inboard-powered boats and fish "full-time;" the rest are skiff fishermen who go only during the summer. Only three or four of the fishermen from these harbors go fishing throughout the year. Many of the men who are considered "full-time" fishermen take other jobs in the winter months.

All of the skiff fishermen, of course, remain in the harbors and near shore. The full-time fishermen with inboard-powered boats, however, range quite far. Some go as far as Boone Island.

2. Marketing

Most of the lobster fishermen from York Harbor sell their catch to V and A Lobster Pound. About five men sell to Saltwater Farms. Both of these buyers have docks on the northern shore of York Harbor. V and A supplies fishermen with gas and bait.

Most of the fishermen at Cape Neddick River give Cape Neddick Lobster Pound first refusal on their lobsters, since this restaurant allows them to use its shorefrontage to land their boats, and provides fishermen with a shed for equipment repair and storage.

3. Processing

Saltwater Farm, a food processing firm, produces several lobster dishes from the lobsters it buys which are sold through mail orders (e.g. canned lobster bisque, lobster meat, lobster sauce, etc.). It also sends live lobsters to customers via air freight.

Groundfish

1. Number of Boats, People, and Fishing Areas

There are two draggers regularly working from York Harbor. One, a 40 foot boat, goes day-tripping throughout the year. In the winter, this boat has used longlines for groundfish. The other boat is 57 feet long. In the winter, it drags groundfish in the local area. In the summer it ranges the Gulf of Maine dragging and swordfishing. Both boats have two man crews.

In the winter, there are two small draggers (40 foot range) from New Harbor which come to York for several months and go day-tripping in local waters.

2. Marketing

All of the fish caught by York Harbor boats are shipped to Boston brokers via one of two trucking firms: Denise Dee Inc. (Kennebunkport) or Southern Maine Fisheries (Elliot).

3. Processing

No groundfish are processed locally.

Minor Fisheries

In the summer, there are three large boats ("Porpoise," "Rambler II," and "E.Z.") in York Harbor which take out fishing parties either half a day or all day.

PORTSMOUTH, NEW HAMPSHIRE AND KITTERY, MAINE

Physical Setting and Population

The city of Portsmouth, New Hampshire is located on the south shore of the Piscataqua River, which forms the boundary line between Maine and New Hampshire. The town of Kittery, Maine, is located directly across the Piscataqua from Portsmouth. The business districts of both Kittery and Portsmouth are located about two miles from the mouth of the river, although numerous installations, docks, etc. extend along the river from the mouth inland for about four miles.

At present, the population of Portsmouth, New Hampshire is 28,139, and Kittery, Maine has 6700 people. Although Portsmouth is the largest single community in the area, Kittery and Portsmouth are part of a large urban complex. Within 20 miles of these two cities are an estimated 110,400 people. This is also one of the most rapidly growing areas in the United States. Not only are Pease Air Force Base and the Kittery Naval Shipyard located here, but recently several very large plants have been located in the area. In many respects, the Kittery-Portsmouth area is becoming a part of the Boston urban complex.

Major Industries and Economic Pursuits

The largest employer in the area is the U. S. military. The Portsmouth Naval Shipyard (in Kittery) employs 7866 civilians and about 1000 military personnel manufacturing and repairing atomic submarines. Pease Air Force Base has 3744 military personnel and 491 civilians. In addition, there are several large plants located in the area. In Portsmouth itself there is the Data General Corporation which employs about 870 people making mini-computors; Liberty Mutual Life Insurance with some 520 employees; New England Homes whose 188 employees manufacture pre-fab houses; Diaphram Industries manufacturing molded rubber, with over 180 employees; and Post Machinery Company, which makes folding machines and has 116 employees. In addition, there are several plants employing under 100 employees which make machine tools, microscope slides, plumbing supplies, tabulating cards, prepared salads, and thermal underwear. There are also several very large oil terminals in Portsmouth and Newington to the west, including those operated by Mobil Oil Corporation, North East Petroleum, C. E. Sprague, Union Oil, Gulf Oil, and New England Tank Industries. In nearby Newington, upstream from Portsmouth, there are several important industrial complexes. Sea 3 Company operates a liquid propane gas terminal, Simplex Wire Corporation has a plant manufacturing wire cable; the C. E. Avery Company manufactures parts for nuclear powered generating plants. There are also several installations in the area of special interest--namely the Booth Fisheries plant, the U. S. Coast Guard Station, and the Bruno and Stillman boat manufacturing plant (more will be said about these later). In recent years, tourism has become increasingly important, as Portsmouth has renovated many historic buildings in the older sections of the city.

General Infrastructure

Interstate 95 which connects Massachusetts and Maine passes through Portsmouth and Kittery. Moreover, the Spaulding Turnpike, which goes to Manchester and Concord, New Hampshire, intersects I-95 at Portsmouth. The major line of the Boston and Maine Railroad passes through both communities. While tourism is not a major industry in the Portsmouth area in comparison with manufacturing, a good many tourists pass through on their way to points further north in New Hampshire and Maine. There are several motels to accommodate them, which have a total of about 450 rooms. The most important of these motel complexes are at the junction of Interstate 95 and the Spaulding Turnpike, about one mile from downtown Portsmouth.

Portsmouth and Kittery are very old cities. Portsmouth has attempted to make itself attractive to tourists by maintaining a whole series of old houses and shops, particularly in the "Strawberry Banke" section of town, close to the river and downtown. A good many buildings in the central section of Portsmouth have been renovated, and now house dozens of good restaurants, antique shops, book stores, etc.

Portsmouth has a hospital with 148 beds and a large number of doctors, dentists, lawyers, etc. who serve people throughout southeastern New Hampshire and southern Maine. The main campus of the

University of New Hampshire is only ten miles away in Durham.

In addition, Portsmouth serves as a shopping center for the entire region. Not only does the renovated downtown section have a good many specialized stores, but a very large shopping mall (Newington Mall) has been built near the entrance to Pease Air Force Base.

Port Infrastructure

It is only eight miles from the mouth of the Piscataqua River to the point where it enters Great Bay, but there are a very large number of installations along that section of the river and the numerous islands in it. As one enters the river mouth, there is the U. S. Coast Guard Base at Newcastle. On an island in the Piscataqua, another mile or two upstream, is the huge Portsmouth Naval Prison, which is now no longer used. Still another island, close to the center of Kittery and Portsmouth, is completely covered by installations of the gigantic Portsmouth Naval Shipyard, with its cranes, warehouses, machine shops, and wharfs with atomic submarines. Close to the center of Portsmouth is the Portsmouth Navigation Company which has three tug boats in the 100 foot class used to guide warships and tankers in the treacherous waters of the Piscataqua. The bridge from Kittery to Portsmouth passes through Badger's Island, where several important companies connected to fishing are located. About two miles further upstream from Portsmouth are a series of tank farms operated by Mobil, Gulf, C. E. Sprague, Union Oil, etc. In this area there is also a very large 65,000 square foot concrete pier, storage area, and warehouse operated by the New Hampshire State Port Authority. Still further upstream, in the town of Newington, are docks near the "Sea 3" gas company, the Simplex Wire Corporation, and the C. F. Avery Company.

Between the mouth of the Piscataqua and downtown Portsmouth, there are numerous large and small docks where fishing boats tie up. Some of these are along the main channel of the river, but many are in the small creeks entering the river and on the islands in the middle of it. There are, however, two major concentrations of boats. There are usually 15 to 18 boats, primarily gill-netters and draggers, tied up to the new New Hampshire State Pier on a small island connected to the mainland, very near the center of Portsmouth. There are also many private docks used by lobster fishermen lining the Kittery shore in the channel running between the downtown section of Kittery and the island where the Portsmouth Naval Shipyard is located. In this area is also located the Kittery town landing, a very small wharf, used primarily by fishermen and the trucks unloading fin fish boats. There are at least three marinas open year round where fishermen can obtain gas. In addition, B. G. Toby has a gasoline truck which he will bring to any dock on request to fill up boats.

The banks of the Piscataqua are hardly an ideal anchorage. Two factors explain the very heavy concentration of maritime activities in the area. First, there are very few good natural harbors in this whole section of coast line. Second, the very rapid current in the river, particularly on ebb tide, prevents much ice from forming, so that Portsmouth-Kittery is open to navigation year round.

Types of Fishing

Lobstering and groundfishing are the two major types of fishing activities in the Kittery-Portsmouth area. In the winter, a few purse seiners and herring carriers operate out of the Piscataqua River.

Lobster

1. Number of Boats, People, and Fishing Areas

Since lobster boats are moored at a variety of locations in the creeks and around the islands of the Piscataqua, it is difficult to get an exact count. Several knowledgeable informants estimated the number of full-time lobster fishermen at 30 to 35, however. The vast majority of these use inboard-powered, standard lobster boats. There are also an estimated 80 skiff fishermen, who fish during the later summer and early fall. Most of these boats are moored in the Piscataqua itself. About 12 lobster boats fish from the harbor at Kittery Point, just

outside the river mouth. Very few "full-time" fishermen (perhaps ten) fish in the winter. Many have other jobs at this time of year.

Although the fishermen from Kittery and Portsmouth fish from the same river, their fishing areas are surprisingly discrete. In the early 1970's there was a lawsuit between Maine and New Hampshire over the offshore boundary between the states. The suit eventually went to the U. S. Supreme Court. During these years, several fishermen were arrested and prosecuted by state officials for fishing in waters in the jurisdiction of other states. Lobster fishermen in all harbors have a sense of territoriality, but in the Kittery-Portsmouth area, these norms concerning ownership of ocean areas are strongly supported by the states involved. As a result, Kittery fishermen put their traps in "Maine waters;" and Portsmouth fishermen stay on their own side of the official line.

2. Marketing

Most of the lobsters caught by Kittery-Portsmouth fishermen are sold to the several lobster buyers in the immediate area. The largest buyer is Captain Crawford's, who operates a large wholesale and retail dealership on Badger's Island (Kittery). Earl Sanders, a wholesale and retail store, located on the shore near downtown Portsmouth also buys a lot of lobsters from local fishermen. In addition, the Marconi family operates "Geno's," a small dealership near downtown Portsmouth, Marconi's Market, and the Blue Fin Fish Market. All three handle lobsters and buy directly from local fishermen. In addition, fishermen sell directly to "Newicks," a very large seafood restaurant, to Samuel Lacava, and the Pier II restaurant. Only Lacava's regularly supplies bait to fishermen. Most lobster fishermen buy gas from one of the marinas which are open all year.

3. Processing

Several seafood dealers in the local area cook lobsters and sell lobster meat including Earl Sanders and Captain Crawford's.

Groundfish

1. Number of Boats, People, and Fishing Areas

There are some 17 groundfish boats operating out of Portsmouth and Kittery. There are seven gillnetters from Portsmouth. Two boats, a 55 foot (Bruno and Stillman) and a 46 footer are capable of fishing far offshore. The rest are in the 38 to 42 foot class and ordinarily go no further than Jeffrey's Ledge about 20 miles out. There are also six draggers. Three of these are older wooden eastern-rigged boats between 60 and 70 feet long, which fish Boone Island and other inshore grounds and on Jeffrey's in good weather. There are also two new draggers (40 and 50 feet) and a 72 foot vessel which is not completely rigged out for fishing yet. The big vessel will range the Gulf of Maine; the small draggers normally go day-tripping.

In addition, there are three boats on the Kittery side: two gillnetters (42 and 54 feet) and a 42 foot dragger. All of these boats go day-tripping and travel no further than Jeffrey's.

All the small draggers and gillnetters normally carry a crew of two to four men. The big 72 foot vessel will have a crew of five or more.

2. Marketing

Most of the groundfish caught by Portsmouth-Kittery boats is trucked to Boston by Southern Maine Fisheries Corporation of Elliot and sold by one of the Boston brokers. However, the Newburyport Cooperative also buys fish from one or two local boats on a regular basis. In the near future, a good deal of fish will probably be handled by the Portsmouth Fishermen's Coop which is currently being formed. A surprising amount of locally caught fish is consumed in local seafood restaurants. This is particularly true of Newick's which owns two large gillnetters fishing out of Portsmouth. Local boats also sell fish in Gloucester.

3. Processing

A great deal of fish is processed by the Booth Fisheries Plant in Portsmouth. None of this fish is purchased locally, however. Some of the fish caught by local boats is bought and filleted by Southern Maine Fisheries and sold in its retail store. Newick's restaurant uses a good deal of the fish caught by its own two boats. Other local restaurants and small fish stores also purchase some fish from local boats.

Minor Fisheries

In the fall and winter, one or two purse seiners work out of Portsmouth Harbor. In recent years, they have tied up behind the Pier II restaurant. These boats are regularly accompanied by a carrier. Much of the herring caught by these boats is unloaded at Rose's Wharf in Gloucester and carried to plants in Maine in trucks.

In 1978, Silver Mink, a wooden scalloper in the 80 foot class made Portsmouth its home port. This vessel fished throughout the Gulf of Maine and had a crew of 11 men.

Important Institutions Related to Fishing

Booth Fisheries Plant

Booth Fisheries maintains a very large fish processing plant in the Industrial Park near Interstate 95 and U. S. 1, about two miles southwest of the central part of Portsmouth. The plant was built in 1967, and regularly employs about 350 people. Most of the raw fish products are purchased abroad. Only 5 percent of the fish used are caught by U. S. fishermen and landed in American ports. The plant operates five processing lines, and makes 15 to 20 whole product lines. While the plant does produce some products made from shrimp, scallops, and oysters, most of the products are made from frozen fish blocks. The largest selling items produced by this plant are battered and breaded fish products which are frozen. The largest market for the firm's products is the American Midwest.

Bruno and Stillman Boat Yard

This firm's plant is located in Newington, within five miles of downtown Portsmouth. The company produces six basic fiberglass hulls: two types of hulls are finished into yachts; the other four hulls (35 feet, 42 feet, 55 feet and 94 feet) are usually made into fishing boats. An estimated 125 people are employed at present. Although the company is only 12 years old, it is one of the largest producers of fishing boats in New England. In recent years, Bruno and Stillman boats have begun to be sold in Alaska and on the west coast.

New England Fishing Gear

This firm is located on Badger's Island, Kittery, and sells all kinds of heavy-duty fishing gear to local fishermen. It also serves other fishermen from Maine to Campobello by mail order. The owner, B. G. Toby, is involved in several other ancillary businesses related to fishing. He markets swordfish, has a business supplying fuel to local fishing boats, and also owns a 46 foot gillnetter ("Christen Marie"), which fishes from Portsmouth or Gloucester, etc. Altogether, B. G. Toby employs twelve people in his businesses, plus the crew of his gillnetter.

Southern Maine Fisheries

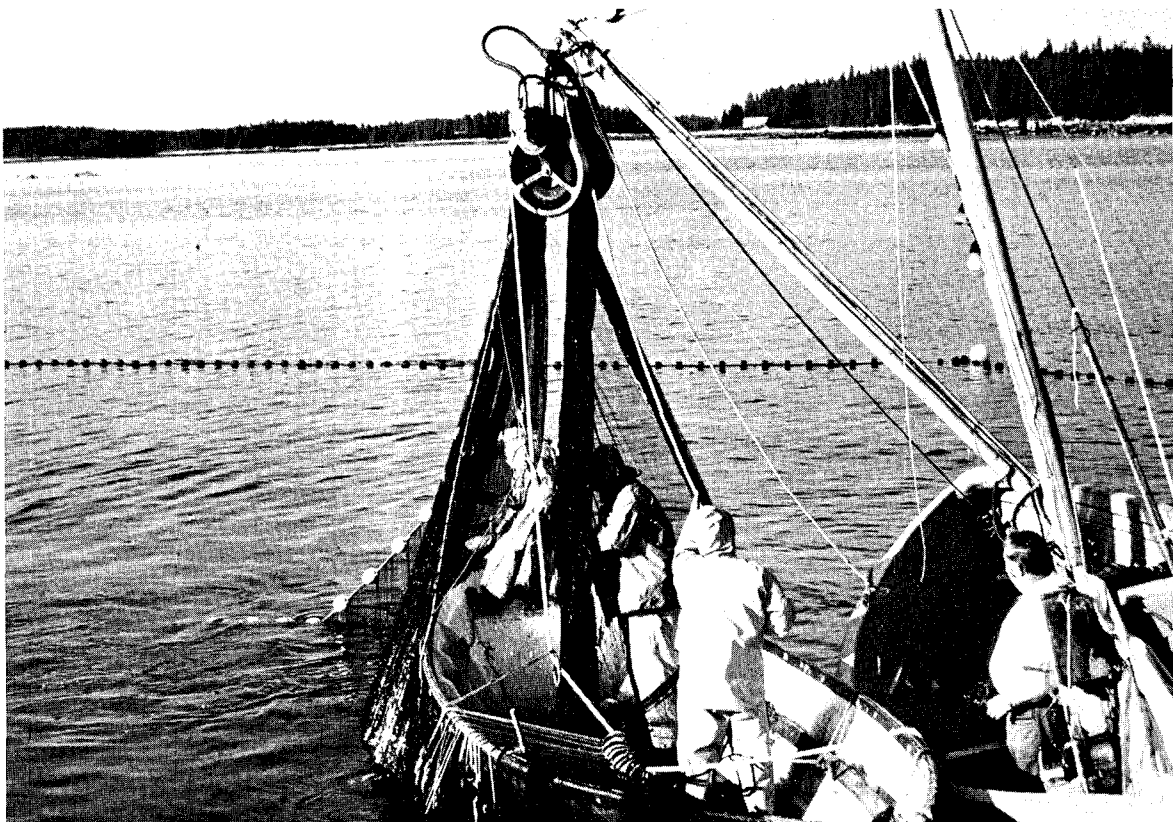
This firm, located in Elliot, Maine near Kittery, is one of the largest truckers transporting fish from Maine and New Hampshire ports to markets in Boston, Gloucester, New York, etc. The seven trucks the firm owns or rents usually pick up fish from docks in southern Maine and New Hampshire (e.g. Kittery, Portsmouth), but have in the past obtained fish all the way from New Harbor to

Provincetown. In recent years, the firm has begun to fillet a great deal of the fish it handles, and sells it in its own retail outlet on Route 236 in Elliot, called the "Seafare Market," or to restaurants and institutions in the area. The firm employs about 17 people.

U. S. Coast Guard Portsmouth Harbor Station

There are 38 men attached to this station which is located in Newcastle, New Hampshire, near the mouth of the Piscataqua River. Twenty-seven men are attached to a search and rescue unit which has at its disposal a 41 foot utility boat and a 40 foot lifeboat. This unit answers emergency calls from Great Boars Head, New Hampshire, to Cape Porpoise, Maine. An additional 12 men are attached to the station who are in a special electronics repair unit.

The U.S.C.G. cutters "Active" and "Decisive," which are both 210 feet long and have crews of 72 men, make the Portsmouth station their home port. These cutters are under the direct control of the First Coast Guard District in Boston. One of their primary duties is to enforce the "200 mile limit" in offshore areas of the Gulf of Maine.



RYE HARBOR, NEW HAMPSHIRE

Physical Setting and Population

Rye Harbor is located on U. S. 1A about seven miles north of Hampton Beach, New Hampshire and about nine miles south of Portsmouth, New Hampshire. There are four centers of population in the town of Rye: Rye Beach, North Rye Beach, and West Rye. The total population of the town is 4083, but Rye Harbor itself has no more than a few hundred people. Rye Harbor consists of little more than the harbor itself packed with boats, and a single row of houses stretched along U. S. 1A and the shore. Behind the highway and harbor are hundreds of acres of empty marsh land.

Major Industries and Economic Pursuits

There are no industrial plants and only a few commercial establishments in Rye Beach. Most of the people in town work in Portsmouth or in one of the heavily industrialized towns in northern Massachusetts. Many of the fishermen whose boats are moored in Rye Harbor live in the hamlet itself, but most of them live in Hampton, Hampton Beach or other surrounding towns.

General Infrastructure

Rye Harbor is served by U. S. 1A. No other transportation facilities exist. There are no shopping facilities to speak of in Rye Harbor. There is a good fish market (Drakes), Saunders Restaurant and Motel, Ray's Restaurant, and a small state park. There is little else save for the private homes along the shore.

Port Infrastructure

Rye Harbor itself is perhaps one-fourth of a mile long and not as wide. It is protected from open ocean by a granite breakwater at the entrance of the harbor. The highway goes around the harbor on the west and north. The only structures on the harbor itself are Saunders Restaurant and a few houses on the south side of the harbor. The only facility at Rye Harbor is the New Hampshire State Pier complex. There is a launching ramp and set of wharfs for pleasure boats and a large parking lot. A few yards away is a wooden pier and parking space for commercial fishermen. There is nothing on this pier at all save for a gas pump, which is operated by a man who has leased the concession from the state. The State Pier complex is used by two 70 foot party boats. "Atlantic Star" and "Atlantic Queen," which take out fishing parties within a radius of 30 miles.

Types of Fishing

Only lobstering and groundfishing boats are moored in Rye Harbor.

Lobster

1. Number of Boats, People, and Fishing Areas

There are 20 inboard-powered lobster boats operating from Rye Harbor. Only eight of these men, however, can be considered "full-time" fishermen, and even they rarely go fishing in the winter. The other 12 have other jobs and fish part-time. In addition, there are about 15 men and boys who fish from skiffs in the summer. All of these boats fish within 10 miles of the harbor. None go offshore.

2. Marketing

There is no lobster dealer operating in Rye Harbor. Some fishermen regularly sell their catches to Drake's Fish Market or in Hampton Beach to the New Hampshire Lobster Company or Kelly's Lobsters. Many lobsters go directly to three local restaurants. Several local

fishermen regularly sell their catch to one of the lobster buyers in Portsmouth, especially Earl Saunders. The fishermen get their gas at the State Pier. The bait they either catch themselves or buy in Gloucester.

3. Processing

None.

Groundfish

1. Number of Boats, People, and Fishing Areas

There are nine boats fishing out of Rye Harbor which catch groundfish all the time or during part of the seasonal cycle. One 55 foot boat and three boats in the 38 to 42 foot class do groundfishing throughout the year. The large gillnetter has a four man crew, while the smaller ones have crews of three. The other five boats range from 25 to 40 feet and go lobstering during the late summer and fall. These boats have three man crews when groundfishing. All nine boats fishing for groundfish use gillnets exclusively due to the broken nature of the bottom in the vicinity of Rye Harbor. Generally all these boats fish within 30 miles of the harbor, but in the summer they sometimes take trips lasting up to three days far out in the Gulf of Maine.

2. Marketing

Most of the groundfish caught by Rye Harbor boats are transported to Boston by Southern Maine Fisheries. The owner of Drake's Fish Market also operates a 55 foot gillnetter. Most of the fish he catches goes to his own market, or is sold on the Boston market.

3. Processing

Drake's Fish Market fillets some groundfish caught locally. No other processing is done in Rye Harbor.

HAMPTON BEACH--SEABROOK BEACH, N.H.

Physical Setting and Population

Hampton Beach and Seabrook Beach lie on the coast of New Hampshire just north of the Massachusetts border. Seabrook Beach is adjacent to Salisbury, Massachusetts.

The town of Hampton, N. H. has a total population of 8011; and Hampton Beach is a precinct of Hampton with an estimated permanent population of 2000. Seabrook Beach is an integral part of the town of Seabrook, N. H. which had a total permanent population of 3055 in 1970. Both of these towns lie on thin beaches separated from the mainland by a lagoon, called Hampton Harbor. The boundary between the two hamlets is a small channel connecting Hampton Harbor with the Gulf of Maine. Both towns are devoted to tourism. As one enters Hampton Beach from the north on U. S. 1A, one goes along the highway for three miles with a solid chain of motels, restaurants and rooming houses on both sides of the road. To the left, two blocks away, is the beach and the Atlantic Ocean. In the summer, the beach is packed with thousands of bodies. Next, one passes over a long bridge, transversing the entrance to Hampton Harbor, and enters Seabrook Beach. Here the motels, restaurants and other commercial establishments are only one block deep and not as thick. There is no town center. Two miles further south, one passes into the state of Massachusetts with no diminution of the "beach culture." The attractions of the area are clear--it has miles of the most spectacular beach imaginable.

Major Industries and Economic Pursuits

The largest industry in Seabrook Beach and Hampton Beach is clearly tourism. In the recent past, the two towns were very quiet in the winter, and many of the stores, restaurants, motels, etc. closed for the season. In recent years, many establishments have been staying open all year, and the motels, cottages and apartments have been rented for the winter with increasing frequency. Many of the permanent residents of both towns work in businesses connected with the tourist industry; others are employed at the Seabrook Nuclear Power Station, which is under construction, two miles inland. But increasingly the two communities and the entire area have become bedroom communities with large numbers of people working in the heavily industrialized zone from Boston to Portsmouth.

General Infrastructure

Both Seabrook Beach and Hampton Beach can be reached only by automobile on U. S. 1A. Interstate 95 and the main line of the Boston and Maine Railroad run parallel to the coast some miles inland, but the only practical way to reach the area is by automobile.

There are no industrial plants at either Seabrook Beach or Hampton Beach. The only government-sponsored facilities are the small State Park and State Pier at Hampton Beach, adjacent to the harbor. The Seabrook nuclear power plant is being built in the town of Seabrook, but the cranes and dome housing of the reactor are visible for miles from the beach area. While both Seabrook Beach and Hampton Beach have many of the characteristics of other commercial seaside resort communities, they also are bedroom communities whose inhabitants work in other cities nearby (Boston, Lowell, etc.).

Port Infrastructure

Hampton Harbor lies inside a lagoon, some three miles long, separated from the ocean by a thin spit of beach on which are located all of the tourist facilities of the two towns. One enters the harbor through a narrow cut, perhaps 300 yards wide, spanned by the Route 1A bridge between Seabrook Beach and Hampton Beach. The entrance to the harbor is very shallow and dangerous due to shifting sand bars and silting. Boats are moored in the harbor near both ends of the U. S. 1A bridge. Thus, one anchorage is at the southern tip of Hampton Beach, while the other is about half a mile away off the northern point of Seabrook Beach.

At Seabrook Beach there is one wharf used by the Eastman Party Boat Corporation and another very large state-operated wharf used by construction companies working on the Seabrook nuclear plant. Neither is open to commercial fishermen. Next to the Eastman Wharf there is a parking lot and beach ramp where fishermen come ashore and where trucks loading fish can back down on the beach. Near the Hampton Beach anchorage, there is another very large party boat wharf. There is also a state pier with a paved parking lot capable of holding over 200 cars and space for at least four or five large boats to tie up at once. Most of the groundfish and lobster caught by boats from Hampton Harbor unload at this State Pier. The entire western side of Hampton Harbor is not built up since it is very swampy.

Types of Fishing

Lobster

1. Number of Boats, People, and Fishing Areas

There are a total of approximately 35 lobster boats operating from Hampton Harbor. On the Seabrook side there are eight inboard-powered lobster boats and nine outboard-powered skiffs. At the Hampton Beach anchorage, another ten inboard lobster boats are moored, along with eight skiffs. Most of the skiffs used by fishermen from Hampton Harbor are relatively large (16 to 21 feet), and use gas-driven haulers to retrieve the lobster pots. All of these boats operate in the local area. None set pots far off shore. All of the skiff fishermen and at least six of the owners of the larger boats fish for lobsters only part-time.

2. Marketing

Virtually all the lobsters caught by local lobster fishermen are sold to one of the local buyers or restaurants in the area. The largest lobster buyer is the New Hampshire Lobster Company, located near the State Pier in Hampton Beach. Two local fish markets, Littlefields in Seabrook and Kelly's Lobster in Hampton Beach, also buy substantial amounts of lobsters, along with the "Four Winds" and other local restaurants.

3. Processing

None.

Groundfish

1. Number of Boats, People, and Fishing Areas

There are eight boats in Hampton Harbor which go groundfishing throughout the year. Three of those are draggers; the other five are gillnetters. All of these boats are in the 38 to 42 foot range. The draggers carry a two man crew, the gillnetters three or four men. These boats usually fish within 30 miles of their home harbor. Much of the fishing is done on Jeffrey's Ledge, West Jeffrey's, Isle of Shoals, etc. Periodically some of these boats go much further--to Cashes Ledge, Fipennies or even the edge of Georges.

2. Marketing

Tricoastal Cooperative of Newburyport, Massachusetts buys all of the groundfish produced by Hampton Beach and Seabrook Beach fishermen. Two of the large local restaurants also buy substantial amounts of fish directly from local fishermen.

3. Processing

There is no fish processing plant in either town. Some groundfish is filleted by a few of the small fish markets for their own retail trade.

Minor Fisheries

In Hampton Harbor, there are three party boat companies which own and operate 11 boats. Smith and Gilmore and Al Gauron have three boats each which are moored on the Hampton Beach side of the harbor. Eastman's Party Boats has another five which leave from the company's wharf on the Seabrook Beach side of the harbor. Most of these boats are in the 50 foot range and carry about 40 passengers each. Some take passengers for half a day, others for day fishing trips. These boats catch substantial amounts of fish within thirty miles of Hampton Harbor.



SECTION III

REGIONAL OVERVIEW AND SUMMARY



Traditionally, descriptions of the fishing industry have used the individual fishery as the unit of analysis. This assumes (a) that there are distinct harvesting, marketing and processing sectors for each species (or group of species, as in the case of some groundfish) and (b) that for each fishery, practices are uniform throughout the entire region where the fishery is carried out. It should be clear from these port descriptions that neither of these generalizations holds true in Maine and New Hampshire. First, fishermen are frequently involved in multiple fisheries. Second, although the processing and marketing spheres for each fishery are somewhat more distinct and specialized than is the case in harvesting, in many instances dealers and processors are handling more than one species. Third, individual fisheries, and the area's fishing industry as a whole, exhibit a good deal of variability from one area to another along the coast. In order to show the interrelationships among various fisheries and to give some idea of the heterogeneity of the fishing industry, we will focus on two kinds of data derived from the port by port study of fishing communities.

First, the overall geographic, economic, and social context within which fishing takes place varies from region to region, following roughly an east to west continuum from the Canadian border through New Hampshire (actually, the continuum could be extended to northeastern Massachusetts). Second, the type of fishing being done varies from one region to another, and even from one town to another within the same general region. It is not just that the emphasis on given species varies town by town or region by region; the fisherman's seasonal cycle--the kinds of species switching he may carry out--also shows marked variability.

Recognizing that the northern New England coast forms a continuum, it is nonetheless useful to divide it into several regions in order to gain a closer understanding of the fishing industry. County divisions along the coast correspond to some degree to major socio-economic and fishery regions; however, for some purposes, several counties can be grouped together since they have a good deal in common as far as fishing is concerned. Our discussion of the regional context of the fishing industry will therefore use the following divisions:

| | |
|--------------------------|------------|
| Washington County (Me.) | East Coast |
| Hancock County (Me.) | |
| Knox County (Me.) | Mid-Coast |
| Waldo County (Me.) | |
| Lincoln County (Me.) | |
| Sagadahoc County (Me.) | |
| Cumberland County (Me.) | West Coast |
| York County (Me.) | |
| Rockingham County (N.H.) | |

DEMOGRAPHY AND INFRASTRUCTURE

The west coast area is an extension of the urbanized, industrialized, densely populated eastern seaboard region. The population is more wealthy, younger, and has a higher education level than in the east. It is one of the fastest growing areas in the country, both in terms of industrial development and in population increase. Alternate economic opportunities are good, and the unemployment rate is a good deal less than it is in the middle or eastern parts of the coast. Table 1 summarizes some key employment characteristics of Maine and New Hampshire coastal counties as of 1977. Note especially the differences in the unemployment rate as one goes from east to west.

TABLE 1
Non-Fishing Job Opportunities in
Coastal Maine and New Hampshire Counties

1977

| <u>County</u> | <u>Total Population</u> | <u>Total Number of Employees</u> | <u>Jobs in General Construction</u> | <u>Manufac- turing</u> | <u>Retail</u> | <u>Service</u> | <u>Unemployment Rate</u> |
|-------------------------------|-----------------------------|--|---|----------------------------|---------------|----------------|------------------------------|
| Washington | 29,859 | 5,423 | 255 | 2,235 | 1,185 | 1,113 | 6.6 |
| Hancock | 34,590 | 8,390 | 768 | 2,194 | 2,009 | 2,151 | 6.1 |
| Knox | 29,013 | 7,070 | 387 | 2,154 | 1,547 | 1,856 | 6.8 |
| Lincoln | 20,537 | 3,563 | 334 | 666 | 937 | 919 | 7.0 |
| Sagadahoc | 23,452 | 6,950 | 215 | | 696 | 1,971 | 6.6 |
| Cumberland | 192,528 | 71,503 | 4,297 | 16,625 | 15,952 | 16,962 | 5.0 |
| York | 111,576 | 25,737 | 1,704 | 10,815 | 5,754 | 4,715 | 2.6 |
| New Hampshire (Rockingham) | 138,951 | 38,246 | 2,234 | 10,731 | 12,261 | 7,774 | 2.7 |

Source: County Business Patterns
Maine and New Hampshire (1977)
U. S. Department of Commerce

In general, harbors are fewer and poorer in quality in the west coast region than they are in the east and mid-coast. The coastline is much less convoluted, there are many miles of sand beach, and protected anchorages are at a premium. Nonetheless, there is a great deal of recreational boating and a well-developed infrastructure oriented toward this activity--yacht clubs, marinas, and boatyards. (In fact, 24 out of a total of 44 marinas in Maine coastal ports are located in York and Cumberland Counties). Large numbers of visitors are attracted to this region, and there is a highly-developed infrastructure catering to transient tourists. Tourism is the major local industry in many of the ports in this region. In York County, Maine at least half the ports can be classified as among the major transient tourist centers in the state. The same concentration of tourism is also evident throughout coastal New Hampshire.

As far as fisheries are concerned, all ports in the west coast region have good access to major transportation facilities, and all are close to major markets. However, in many respects (processing, equipment sales and service, etc.) the area is heavily dominated by urban areas. Portland is a major focus for many ports in the western and mid-coast region. (New Hampshire fishermen obtain many services in Portsmouth or Gloucester).

In the eastern part of the region, fishing takes place in a largely rural, sparsely-populated, non-industrialized area. It has long been economically depressed. There has been a steady out-migration for the last century. The population is poorer, older, less-educated, and (generally) less-skilled than in the west and mid-coast regions. (Hancock County's population, however, is relatively younger, wealthier, and better-educated than Washington's.) Economic opportunities are very poor, and unemployment is chronically high (see Table 1, above). Fishing and fishery-related activities (e.g. processing, boat building) are much more crucial components in local economies than they are in west coast communities whose economies are more diversified. Most ports are largely lacking in shopping facilities and other services (medical, legal, banking) and people dwelling there must travel relatively long distances to "inland" towns such as Bangor or Ellsworth to obtain such services. This is partly the result of geography and historical factors which have led to the development of larger, service-oriented towns and cities along major "inland" highways (especially U. S. 1), with the fishing ports being located down long peninsulas and on adjacent islands. (Much the same situation holds true for many ports in Maine's mid-coast region.)

One advantage both the east and mid-coast regions have over the west is an abundance of good harbors. Many of these are quite small, however. The eastern coastal area is not economically dominated by any one large port, even though it contains the port with the largest number of fishermen (i.e. Stonington). The tourist industry overall is not highly developed, although there are scattered areas where concentrations of cottages are located, and a few places where there

are a good many transient tourist facilities (most notably Mt. Desert Island). There is also a good deal of pleasure-boat activity in some Hancock County ports.

Markets for all products, including fish, are distant and access to major transportation facilities is limited. Fish processing facilities are confined almost solely to sardine and herring plants; many of these are quite old, and there are also numbers of abandoned plants in some ports.

Boat building is a major activity in several ports in the east coast region, and a fairly large proportion of Maine's lobster boats are built in the Jonesport-Beals area. All told, about 27 major boat yards are located in Hancock and Washington Counties (compared with about 8 in Maine's west coast counties and 29 in the mid-coast). However, other firms catering to fishermen's needs are very few, and people must travel long distances to obtain services and supplies.

In most demographic and economic characteristics, as well as in its location, the mid-coast region stands between the west and east. In age structure, education levels, and income the region as a whole is clearly intermediate. This is true in spite of the fact that the counties within the region show some degree of variation when compared with one another. For example, two of its counties (Lincoln and Knox) have the oldest populations on the Maine and New Hampshire coast, due largely to a recent heavy influx of retirees. However, the two others (Sagadahoc and Waldo) have the first and third youngest coastal county populations. In education levels, Lincoln, Sagadahoc, and Knox counties are quite similar, but the Waldo County population has a much lower level--second lowest after Washington County. Median family income in 1970 was \$7,707 for Maine's mid-coast region, compared with \$8,892 for Maine's west coast counties, \$10,084 for Rockingham County, N.H. and \$6,872 for Maine's eastern counties.

There are more cities in the mid-coast region than in the east. Two of these (Belfast and Bath) have very few fishermen, though both have fish processing facilities, and Bath is a nationally important ship-building center (largely military and merchant ships). The third city, Rockland, is New England's fifth largest port in terms of pounds of fish landed and is a major processing and marine service center. (There are more people employed in processing, about 1150 at peak season, in Rockland than in any other Maine or New Hampshire port.)

The average size of the towns from which fishing is carried on is much smaller in the mid-coast region than it is in the west, but slightly larger than in the eastern region. (Port population in 1970 averaged 10,822 in New Hampshire. In Maine, average port populations were: 12,058 in the west; 2,038 in the mid-coast region; and 1,858 in the east.) Within the mid-coast region, ports in Sagadahoc and Waldo Counties have somewhat higher average populations than those in Lincoln and Knox Counties: 3,919 for Sagadahoc, 2,397 for Waldo, 1,767 for Knox, and 1,385 for Lincoln. However, Sagadahoc County has only six ports (one being the city of Bath) and Waldo only four (one being the city of Belfast). Knox and Lincoln Counties, by way of contrast, have at least 12 ports each, most very small.

The following tables and figures summarize key demographic and infrastructural characteristics of Maine and New Hampshire ports and coastal counties. County-wide statistics are taken from the 1970 U. S. Census, and include data on all residents of the county, not just those dwelling in the ports surveyed in 1978 by Acheson et al.

Figure 2 shows education levels, median age, and family income for Maine's three coastal regions and for New Hampshire's Rockingham County. As discussed above, income and educational levels drop and median age rises as one moves from west to east along the coast. These figures point to the fact that the eastern part of Maine has long been impoverished and has experienced a good deal of out migration of young, skilled people. The western part of the region is currently attracting a good deal of industry, paying good wages, and attracting an influx of younger people.

Table 2 gives an indication of the degree of urbanization along the coast, looking at two measures: average populations of the ports, and overall population densities of each coastal county. Both of these indices underscore the relatively rural nature of the eastern part of Maine and the increasing population density as one moves west.

FIGURE 2. SELECTED DEMOGRAPHIC CHARACTERISTICS, BY REGION (1970 CENSUS).

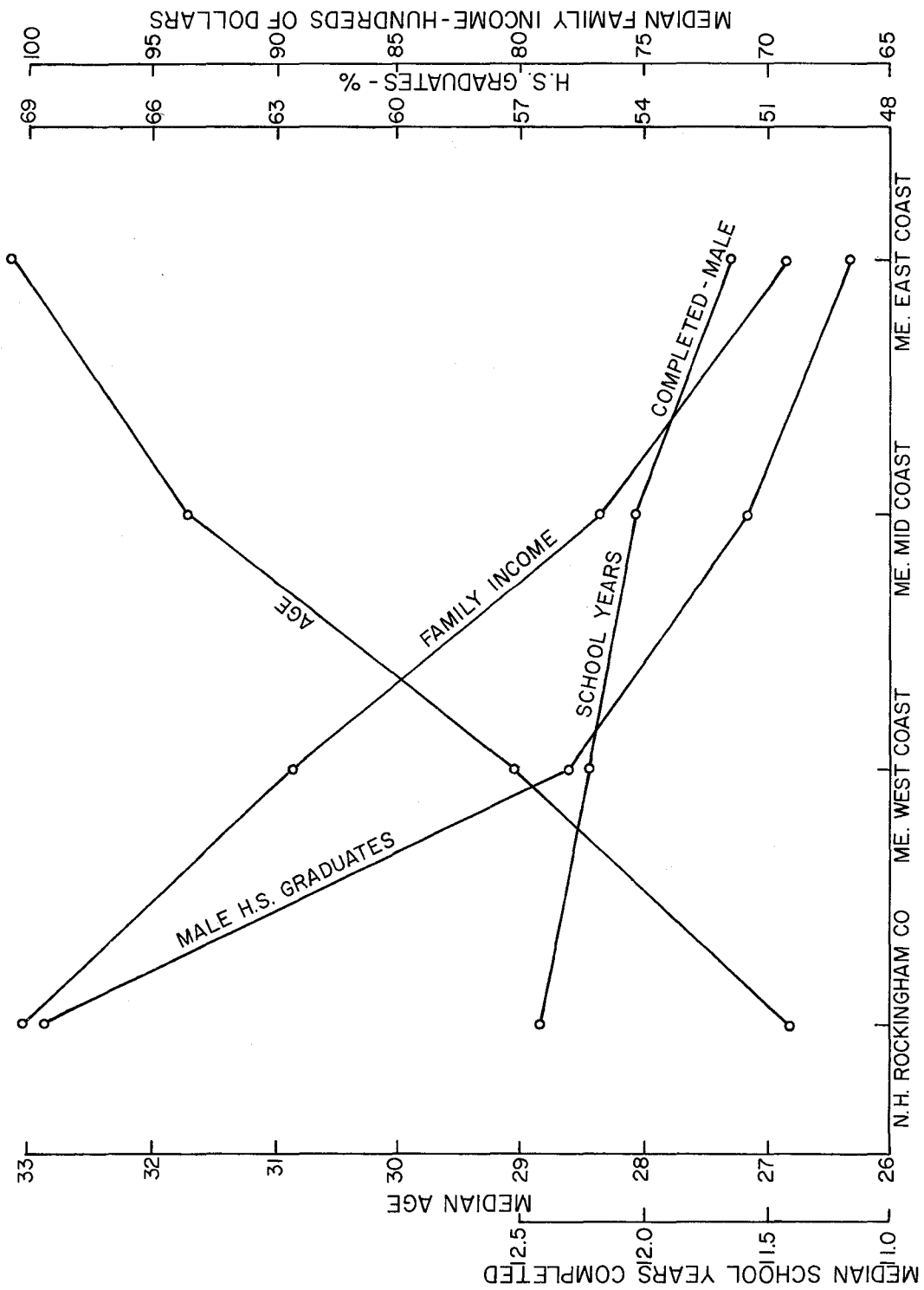


TABLE 2

Degree of Urbanization
in Maine and New Hampshire
Coastal Counties

| <u>County</u> | <u>Average Population Per Port</u> | <u>Population Density Square Mile</u> |
|-------------------|--|---|
| Rockingham (N.H.) | 10,822 | 201.1 |
| York (Me.) | 8,254 | 111.5 |
| Cumberland (Me.) | 15,063 | 219 |
| Sagadahoc (Me.) | 3,919 | 91.3 |
| Lincoln (Me.) | 1,384 | 45.2 |
| Knox (Me.) | 1,727 | 78.6 |
| Waldo (Me.) | 2,397 | 31.7 |
| Hancock (Me.) | 1,524 | 22.5 |
| Washington (Me.) | 1,169 | 11.5 |
| Statewide (Me.) | | 32.1 |
| Statewide (N.H.) | | 79.2 |

Source: 1970 U. S. Census, U.S. Bureau of Census
1973 Maine Economic Data Book

In Figure 3 and Table 3 selected port infrastructure characteristics are given. Figure 3 shows transportation and tourist infrastructure development. The percentage of ports having a local rail line and the percentage located within three miles of a major highway (U.S. 1, the Maine or New Hampshire Turnpike, or I-95) is shown for each region, along with the percentages of ports classified as major pleasure boat ports and major transient tourist ports. Note that transportation and tourist facilities decline from west to east along the coast, with the exception of the "pleasure boat port" category. As previously noted, there are a relatively large number of such ports in Hancock County, which brings up the figures for the eastern coast region (in spite of the fact that there are no major pleasure boat ports in Washington County.)

Table 3 summarizes selected fisheries-related facilities located in the ports surveyed in 1978. Note that this does not include all such facilities in the two state area or in the coastal counties themselves - only those located in the ports. To better interpret these figures, some brief definitions are necessary. More detailed discussion on this was given in the individual fisheries sections.

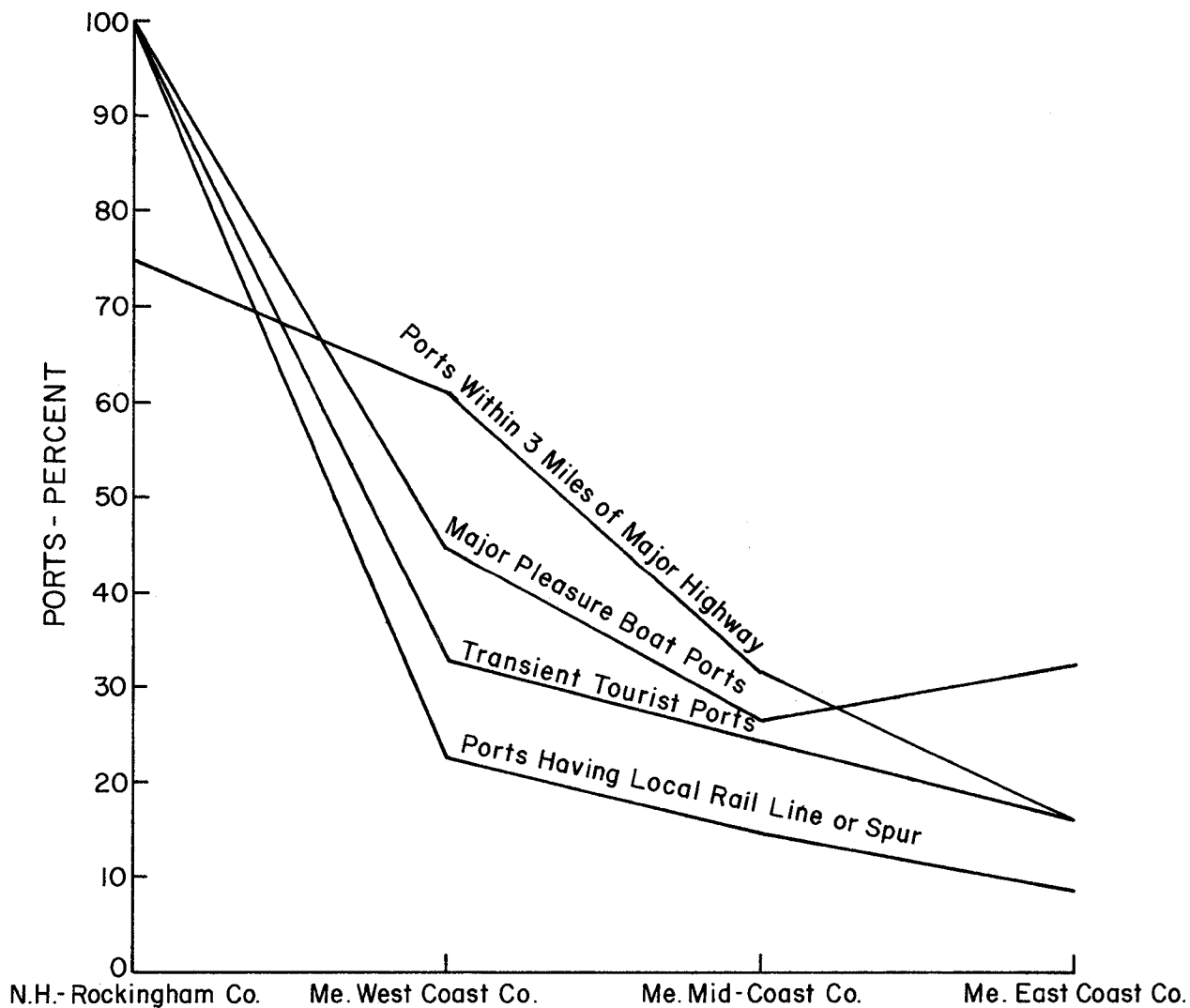
Local Dealer - Purchases fish/shellfish direct from fishermen. Usually wholesales the product to other dealers, to distributors, or to processors, but may have local retail-business also. Usually provides services (dock, fuel, some supplies, sometimes credit or loans) to the fisherman. Small local retailers, such as fish markets which buy small amounts for local sale, are not included in most cases. This kind of marketing through a local dealer is most common for lobster, clams, worms, and scallops.

Co-op - Operates much like a local dealer, except that the business is owned by the fishermen-members, who thereby obtain better prices. Most co-ops handle mainly lobsters, and most will buy from non-members.

Processor - Converts raw fish/shellfish to other forms, e.g. fresh and frozen fillets, canned products, cakes, breaded or batter-dipped frozen products, fish meal, etc. The raw products are obtained by processors in a variety of ways: frozen blocks from other New England ports or imported from other countries; from company-owned vessels; from privately-owned vessels, some of which have a long-standing direct marketing arrangement with the processor (especially true in the herring fishery); fresh products obtained from dealers, wholesalers, brokers, or other processors; etc. Again, small-scale retailers who may do a little processing are not included here.

Trucker-Broker - A marketing arrangement common in groundfish sales. A trucker picks up fish at the dock and transports them to a broker who sells them, usually at auctions in Boston, but

FIGURE 3. PORT INFRASTRUCTURE CHARACTERISTICS:
TOURISM AND TRANSPORTATION.



sometimes elsewhere. Trucker and broker each receive a percentage commission from the sale, but the fish are actually owned by the fishermen until they are sold. A trucker may reside in one county, but have dealings with fishermen in other counties. Small retailers who sell fish from roadside trucks are not included in this category, nor are individual fishermen who sometimes truck their own catches.

Boat Yard - Builds, repairs, maintains, and stores boats; only those which handle fishing vessels are counted.

Marina - Provides moorings and some marine services (e.g. gas, storage, some supplies), primarily for the pleasure boat trade.

Other Services - Electronics, nets, engines, etc.

TABLE 3

Selected Fishing Services
Coastal Ports, by County (1978)

| | No. Ports | No. Dealers | No. Processors | No. Co-ops | No. Trucker- Broker | No. Boat Yards | No. Marinas | Other* |
|-------------------|--------------|----------------|-------------------|---------------|------------------------|-------------------|----------------|--------|
| Rockingham (N.H.) | 4 | 4 | 1 | 0 | 2 | 1 | 0 | 0 |
| York | 8 | 17 | 1 | 0 | 8 | 2 | 10 | 1 |
| Cumberland | 10 | 27 | 17 | 2 | 0 | 6 | 14 | 26 |
| Sagadahoc | 6 | 5 | 1 | 0 | 1 | 1 | 3 | 0 |
| Lincoln | 12 | 26 | 3 | 3 | 0 | 14 | 0 | 3 |
| Knox | 12 | 17 | 9 | 4 | 1 | 13 | 5 | 7 |
| Waldo | 4 | 0 | 2 | 0 | 0 | 1 | 1 | 0 |
| Hancock | 15 | 21 | 7 | 5 | 4 | 10 | 11 | 3 |
| Washington | 9 | 22 | 18 | 2 | 2 | 17 | 0 | 2 |
| Totals | 79 | 139 | 59 | 16 | 18 | 65 | 44 | 42 |

*Number of "other fishing services" is underestimated. Only larger businesses were included.

REGIONAL FISHERY CHARACTERISTICS

Types of Fishing

The importance of different fisheries varies by region. Groundfishing is concentrated in New Hampshire and in the western part of Maine, at least in terms of numbers of boats and fishermen who pursue groundfish year-round. However, there are a fair number of seasonal groundfishermen (many of them lobstermen) in the mid-coast region, and increasing numbers in the east as well, who go groundfishing during slack seasons in other fisheries. For these people, even though groundfishing may not provide the major part of their income, it can make the difference between economic survival and perhaps going out of business. Most of the lobster fishermen who switch to groundfishing for part of the annual round do so in the spring when lobster fishing has been relatively bad for the past few years. (It should be noted that a large number of lobstermen gained experience with net fishing during the years when there was a large shrimp fishery in Maine, and that some of them are putting this experience to use in groundfishing.)

The herring fishery has traditionally been concentrated in the eastern part of the coast. This is due to the fact that, until recently, herring were caught in weirs and stop seines, and schools of herring come ashore only in the eastern and central parts of this region. Now, with additional purse seiners going for herring, the advent of pair trawling, and the opening up of a European market for larger, adult herring, we expect that herring fishing will not be quite as localized.

Major processing facilities are still numerically concentrated in Washington and Hancock Counties, but there are several large establishments elsewhere, and more projected for the future; most of the new facilities are equipped with automatic filleting machines to handle larger fish for export as fillets to Europe.

Serious clamming activity is found mainly in Hancock and Washington Counties, though there are some individual communities in the mid-coast region where clamming is also very important. Clamming is an activity that attracts a good many part-time and recreational fishermen, especially in the west coast regions where there are very few full-time clammers except in the Scarborough area. While many ports have a few "professional" clammers, large groups of such fishermen are only found in a few places such as Millbridge, Steuben, the Gouldsboro area, the Waldoboro area, and others. Unlike most other Maine fisheries, except perhaps the harvesting of marine worms, clamming tends to be something of a fill-in activity for individuals who may have other sources of income at other times of the year. It is concentrated in the eastern counties not just because these are the counties with the largest areas of open, productive flats, but also because these counties show high seasonal rates of unemployment.

Lobstering is more evenly distributed along the coast than any of the other fisheries. Almost every port which has any kind of fishing at all will also have at least a few lobstermen, if only part-timers. Largest total numbers of lobstermen are found in Hancock County, followed by Lincoln and then Knox. Way downeast, lobstering tends to taper off, and close to the Canadian border there are no major lobster ports. Lobstering is less important in York County, Maine and Rockingham County, N.H. than is groundfishing. However, lobstermen in these counties are perhaps more specialized than are some of the lobster fishermen in the east and mid-coast areas. Almost none of the full-time lobster fishermen in York and Rockingham Counties shift into other fisheries over the course of the annual cycle. In addition, the proportion of part-time lobstermen is much higher in Rockingham, York and Cumberland Counties than it is in the east and mid-coast counties as a whole.

Scalloping has attracted an increasing number of fishermen in recent years, especially lobstermen who rig up for seasonal scallop fishing during the slack period in lobstering. Because it is primarily a day-trip fishery in this region, scalloping is confined largely to those areas where local supplies are greatest--that is, Knox, Hancock, and Washington Counties. Only about one-third of all those who go scalloping have scallops as their major fishery, and these fishermen are concentrated in only a few ports--especially Eastport-Lubec, Rockland, and Stonington. Maine's largest scallop fleet is in Stonington, which has both seasonal scallop fishermen and fishermen who go for this species more or less year-round. In 1978 there was one New Hampshire scalloper, an 80 foot vessel with an 11 man crew which fished off-shore year-round.

Digging of marine worms is the most localized fishery, not simply on a regional basis but even on a town basis. To some degree this is related to the locations of productive worm flats, but local traditions of worm digging and the presence of dealers in the area also influence the distribution of worm digging. In 1978, we found wormers only in Lincoln, Hancock, and Washington Counties. Within these counties, the vast majority of worm diggers operated in only a few towns: In Lincoln County, Damariscotta, Newcastle, Boothbay, Boothbay Harbor, and (especially) Wiscasset; in Hancock County, Hancock and Sullivan; and in Washington County, South Addison, Millbridge, Steuben, and Jonesport.

The above generalizations concerning the areal distribution of the various fisheries are supported by statistical summaries drawn from our port surveys. Three kinds of data are presented here: (1) information concerning total vessels involved in Maine and New Hampshire's major fisheries, (2) an analysis of the various gear types used, for those fisheries where more than one fishing technique is involved, and (3) figures concerning employment characteristics in the major fisheries.

MAINE AND NEW HAMPSHIRE FISHING VESSELS

In looking both at vessel use and at employment characteristics of the fisheries in Maine and New Hampshire ports, we have found it useful to group fishermen based on their degree of involvement in fishing. This threefold classification will be used throughout the summary figures and tables which follow.

Part-time fisherman: A person who does not gain the major portion of his livelihood in a given year from fishing, irrespective of how much time he spends on fishing.

Full-time fisherman: A person who gains over half of his yearly income from fishing.

Major fishery: For any individual (or vessel) the major fishery is the one from which the boat or full-time fisherman derives the largest portion of the yearly income.

It was necessary to add the concept of "major fishery," since there is so much switching from one fishery to another over the course of the annual cycle. For statistical purposes, if we counted all people who do lobstering, clamming, herring fishing, groundfishing, etc., we would end up counting the same person more than once in many instances, since he may be involved in several fisheries in a given year. Thus, to count the total fishermen in Maine, New Hampshire, or the two-state region we would count all those with lobster, groundfish, whatever, as their major fishery (since each fisherman, by definition, can have only one major fishery).

Table 4 summarizes vessels used in Maine and New Hampshire's most important fisheries, grouped by vessel size and county where the vessel's home port is located. Boats used in the clam and marine worm fisheries are all in the under 25 foot category, and are not included here.

Note that in this table, we are including all vessels used in a given fishery, whether they spend all year or only a few days in that fishery. In other words, in this table we are not concerned with which species is the major one for these boats, but rather with how many vessels all told are involved in each fishery. Therefore, a vessel which goes for more than one species is listed under each species it pursued in 1978.

TABLE 4
Maine and New Hampshire Fishing Vessels
By Fishery and Size

| County | Lobster | | | Groundfish | | | Herring | | | Scallops | | | Redfish |
|------------------|-----------|--------|----------|------------|--------|----------|-----------|--------|----------|-----------|--------|----------|----------|
| | Under 25' | 25-45' | Over 45' | Under 25' | 25-45' | Over 45' | Under 25' | 25-45' | Over 45' | Under 25' | 25-45' | Over 45' | Over 45' |
| Rockingham | 72 | 53 | 0 | 0 | 22 | 8 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| York | 129 | 136 | 1 | 0 | 22 | 11 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Cumberland | 319 | 142 | 0 | 0 | 25 | 49 | 4 | 4 | 1 | 0 | 0 | 1 | 5 |
| Sagadahoc | 44 | 46 | 0 | 0 | 7 | 14 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| Lincoln | 207 | 362 | 0 | 0 | 24 | 15 | 21 | 8 | 11 | 0 | 4 | 0 | 0 |
| Knox | 235 | 357 | 0 | 0 | 26 | 15 | 34 | 17 | 14 | 0 | 27 | 4 | 6 |
| Waldo | 29 | 20 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 4 | 0 | 0 |
| Hancock | 94 | 605 | 1 | 0 | 29 | 1 | 14 | 4 | 12 | 0 | 121 | 5 | 0 |
| Washington | 72 | 229 | 0 | 44 | 30 | 0 | 46 | 3 | 7 | 0 | 45 | 0 | 0 |
| Maine Sub-Totals | 1129 | 1897 | 2 | 44 | 164 | 105 | 119 | 37 | 45 | 0 | 202 | 10 | 11 |
| Total | 1201 | 1950 | 2 | 44 | 186 | 113 | 119 | 37 | 45 | 0 | 202 | 11 | 11 |

GEAR TYPES AND FISHING EMPHASIS

While our emphasis here is on regional characteristics of the fishing industry, some analysis of gear types used on boats from Maine and New Hampshire ports will add to our understanding of the fishing industry as it existed in 1978. As described in the introductory chapters, technology in

the lobster, scallop, soft-shell clam, and marine worm fisheries is relatively uniform up and down the northern New England coast. Herring and groundfish, by way of contrast, are caught in several different ways, and these alternate techniques are not distributed evenly along the coast by any means.

Herring. Fixed-gear operations (stop seines and weirs) are almost all located east of Rockland. Weirs are even more localized in distribution than stop seine operations. In 1978, there were about 33 weirs in Maine, which was a slight increase from the average number in the previous four years; and there were reported to be several new ones under construction in 1978-1980. In 1978, there were 15 weirs in the Eastport area, 6 in and around Lubec, 10 in the Milbridge-Steuben area, and 2 in Isle au Haut (all these ports, except Isle au Haut, are in Washington County).

In 1978, we counted about 80 stop seine "berths." Sixty-three were east of Rockland and 17 west. Quite a few (about 23) were in the Penobscot Bay islands. Another large concentration (about 14) were in the Eastport area.

Since stop seines do not require permanent structures the way weirs do, it is somewhat more difficult to gather data on numbers of operations. Furthermore, as with weirs, the numbers of these operations which actually catch fish in a given year is inevitably less than the total potential "berths."

Purse seiners and pair trawlers were not as concentrated in eastern ports, since they are free to pursue herring wherever they may be found along the coast. In 1978, purse seiners had home ports from Boothbay Harbor eastward. From Rockland east, there were about 14, and between Boothbay Harbor and Rockland, about 11. (There were also 19 vessels used as sardine carriers, many of which can and are sometimes used for purse seining.) Even though there were almost as many boats purse seining for herring in the central part of the coast as there were further east, the fishing effort was not nearly as equal. Of the 11 purse seiners west of Rockland, only five had herring as their major fishery. By way of contrast, 13 out of the 14 boats east of Rockland went mainly for herring. The six pair trawlers all had home ports in the mid-coast area--two in Rockland (Knox County), and two each in New Harbor and Boothbay Harbor (Lincoln County). In 1978, these boats ranged long distances, with herring as their major fishery. In mid winter, they spent several weeks fishing from Massachusetts ports. They also did a fair amount of groundfishing in the spring.

Groundfish. Table 5 on the total set of boats doing groundfishing gives some idea of the areal distribution of this fishery. However, a more complete picture may be gained by examining figures on gear types used and major fishery.

As can be seen in Table 5, the largest total numbers of groundfish boats are concentrated in Maine's two western counties (York and Cumberland) and in New Hampshire. Furthermore, this area has the largest concentration of large groundfish boats. Some 60 percent of those over 45 feet long are located here. The boat figures are even more striking when we exclude those which are engaged primarily in other fisheries such as redfish, herring, and lobster, and look only at the distribution of boats which do mainly groundfishing. These three western counties in 1978 contained about 63 percent of the vessels which had groundfish as their major industry.

If we summarize the distribution of groundfish boats by port, we note much the same pattern, namely that some ports have a much higher proportion of boats pursuing groundfish as a major fishery. In others, groundfishing is a minor activity engaged in by boats which are primarily involved in other fisheries. Table 6 gives the port distribution of boats which have groundfish as their major fishery; only ports having at least four such boats are included.

TABLE 5
Distribution of Boats With Groundfish as Major Fishery
By County, 1978

| | <u>Total Boats</u> | <u>Percent</u> | <u>Major Fishery</u> | <u>Percent</u> |
|-------------------|------------------------|----------------|--------------------------|----------------|
| Rockingham (N.H.) | 30 | 8.7 | 30 | 16.3 |
| York (Me.) | 33 | 9.6 | 31 | 16.8 |
| Cumberland (Me.) | 74 | 21.6 | 56 | 30.4 |
| Sagadahoc (Me.) | 21 | 6.1 | 16 | 8.7 |
| Lincoln (Me.) | 39 | 11.4 | 19 | 10.3 |
| Knox (Me.) | 41 | 12.0 | 15 | 8.2 |
| Waldo (Me.) | 1 | .3 | 0 | 0 |
| Hancock (Me.) | 30 | 8.7 | 9 | 4.9 |
| Washington (Me.) | 74 | 21.6 | 8 | 4.3 |
| Maine Subtotal | 313 | 91.3 | 154 | 83.7 |
| Total | 343 | 100 | 184 | 100 |

TABLE 6
Distribution of Maine and N.H. Groundfish Boats
By Port, 1978
(For all ports having four or more such boats.)

| <u>Port (County)</u> | <u>No. of Boats (Groundfish Major Fishery)</u> | <u>Percent</u> | <u>Total Groundfish Boats*</u> | <u>Percent</u> |
|-----------------------------------|--|----------------|--|----------------|
| Portland (Cumberland) | 43 | 23.4 | 57 | 16.0 |
| Portsmouth, N.H. | 13 | 7.1 | 13 | 3.8 |
| Kennebunkport (York) | 10 | 5.4 | 10 | 2.9 |
| Rye, N.H. | 9 | 4.9 | 9 | 2.6 |
| New Harbor-Pemaquid (Lincoln) | 9 | 4.9 | 11 | 3.2 |
| Hampton-Seabrook, N.H. | 8 | 4.4 | 8 | 2.3 |
| Jonesport-Beals (Washington) | 9 | 4.3 | 18 | 5.3 |
| Cundy's Harbor (Sagadahoc) | 7 | 3.8 | 7 | 2.0 |
| West Point (Sagadahoc) | 6 | 3.3 | 6 | 1.8 |
| Port Clyde-Tenants Hbr. (Knox) | 6 | 3.3 | 16 | 4.7 |
| Boothbay Harbor (Lincoln) | 6 | 3.3 | 10 | 2.9 |
| Vinalhaven (Knox) | 6 | 3.3 | 9 | 2.6 |
| Small Point (Sagadahoc) | 6 | 3.3 | 6 | 1.8 |
| Perkins Cove (York) | 5 | 2.7 | 5 | 1.5 |
| Bass Harbor (Hancock) | 4 | 2.2 | 4 | 1.2 |
| So. Bristol (Lincoln) | 4 | 2.2 | 12 | 3.5 |
| Cape Porpoise (York) | 4 | 2.2 | 5 | 1.4 |
| All Other Ports | 28 | 15.2 | 137 | 39.9 |
| | <u>184</u> | <u>99.2</u> | <u>343</u> | <u>100</u> |

*Includes redfish fleet and any others doing groundfishing anytime during the year.

Portland is clearly the most important groundfish port in terms of boat numbers. Seventeen ports out of a total of eighty (or 21.3 percent) contain 85.2 percent of the boats engaged in groundfishing as the major fishery. These same seventeen ports have 60.1 percent of all boats doing any groundfishing along the Maine and New Hampshire coast.

One striking aspect of this table is the absence of what are considered to be two of Maine's leading fishing ports--Rockland and Stonington. Both of these ports in 1978 had only three vessels pursuing groundfish as their major fishery. Both Rockland and Stonington had 10 boats each that caught any groundfish over the course of the year. If all these boats shifted to spend a major part of their effort on groundfish, these ports would end up close to the top of this table. This brings out a point which must again be strongly emphasized, namely, that we are describing fisheries in these ports at a point in time. This tends to obscure the flexibility of fishermen in shifting fisheries to take advantage of changing economic, environmental and legal conditions.

Table 7 looks at gear types used by groundfishing boats, summarizing first the total number of vessels using each gear type and then the subset of vessels which had groundfish as the major fishery in 1978. Note that in New Hampshire, all vessels which pursued groundfish at all had this as their major fishery. In Maine, by way of contrast, less than half the boats (49.2 percent) did groundfishing as their major fishery (and, as we noted, the majority of these are concentrated in the western counties).

TABLE 7
Groundfish Boats by Gear Type, 1978

| (a) Maine | | | |
|-----------------------|---------------------------|--|-------------------------------|
| <u>Gear</u> | <u>Total No. of Boats</u> | <u>Boats with Groundfish Major Fishery</u> | <u>Percentage (Co.2/Co.1)</u> |
| Otter Trawl | 185 (59.1%) | 105 (68.2%) | 56.7% |
| Gillnet | 61 (19.4%) | 40 (25.9%) | 65.5% |
| Otter Trawl & Gillnet | 9 (2.87%) | 9 (5.8%) | 100% |
| Handline/Longline | 58 (18.5%) | 0 | 0 |
| Total | 313 | 154 | 49.2% |
| (b) New Hampshire | | | |
| Otter Trawl | 9 (30%) | 9 (30%) | 100% |
| Gillnet | 21 (70%) | 21 (70%) | 100% |
| Total | 30 | 30 | 100% |

Among vessels pursuing mainly groundfish, there are some real regional differences in gear types. In Maine, 68.2 percent of these boats used otter trawls, 25.9 percent used gillnets, and 5.8 percent used both kinds of gear in 1978.

In New Hampshire, 70 percent of the groundfish vessels did gillnetting, while only 30 percent went otter trawling. If we look at each gear type separately, we see that in 1978 in Maine 56.7 percent of all boats with otter trawl gear had groundfish as the major fishery, 65.5 percent of the gillnetters did and 100 percent of those using both otter trawls and gillnets were so engaged; none of those using handlines or longlines had groundfish as their major fishery.

The late 1970's have seen gillnets coming into increasing use in northern New England. As mentioned in the earlier discussion on fishing technology (Chapter 2), gillnets are often an interim technology. Especially in mid and east coast Maine, gillnetting is frequently carried out by people who are moving into groundfishing from other fisheries, especially by lobstermen whose boats

may be too small for efficient dragging. Given this, it is surprising that in 1978, a higher proportion of gillnetters than draggers were mainly in groundfishing. About 65 percent of gillnetters were so engaged, as compared with about 57 percent of those using otter trawls. This may be partly accounted for by the fact that the total number of gillnetters is so small compared with the total number of draggers that small changes in numbers of gillnetters pursuing mainly groundfish can mean a major change in the percentages. In addition, the largest number of gillnetters are concentrated in the western portions of Maine and in New Hampshire where in-shore bottom conditions make year-round gillnetting more attractive than dragging. In general, there is much less fishery switching in the west coast area than in the more eastern regions, where gillnetting for groundfish tends to be combined with other fisheries.

EMPLOYMENT CHARACTERISTICS AND FISHERY SWITCHING

Table 8 gives a county by county and overall picture of employment characteristics in the various major fisheries in the Maine and New Hampshire ports surveyed in 1978 and covered in this volume. Note that this table does not include all species landed in Maine and New Hampshire--only those which in that year could be classified as a major fishery (i.e. those which provided over 50 percent of the yearly income for at least some boats and fishermen). Some of the other species pursued are included in the tables on fishery switching (for example, tuna and swordfish); others (such as menhaden and mussels) have been discussed in the earlier port-by-port sections, but are not included here because so few Maine and New Hampshire fishermen went for them in 1978.

SEE TABLE 8 ON FOLLOWING PAGE

TABLE 8

Maine and New Hampshire Fishermen, By County, 1978

| County | Lobster | | Groundfish | | Herring | | Scallops | | Soft-Shell Clams | | Redfish (Ocean Perch) | | | | | | |
|---------------------|-----------|---------------|------------|---------------|-----------|---------------|-----------|---------------|------------------|---------------|-----------------------|---------------|-----|-----|-----|---|----|
| | Part-Time | Major Fishery | Part-Time | Major Fishery | Part-Time | Major Fishery | Part-Time | Major Fishery | Part-Time | Major Fishery | Part-Time | Major Fishery | | | | | |
| Rockingham (NH) | 94 | 56 | 41 | 0 | 100 | 100 | 0 | 0 | 0 | 11 | 11 | 0 | 0 | 0 | 0 | 0 | 0 |
| York (Me) | 113 | 152 | 152 | 0 | 81 | 81 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Cumberland (Me) | 510 | 251 | 251 | 0 | 264 | 206 | 28 | 2 | 0 | 3 | 0 | 110 | 37 | 37 | 0 | 0 | 40 |
| Sagadahoc (Me) | 47 | 43 | 43 | 7 | 40 | 32 | 0 | 0 | 0 | 1 | 0 | 20 | 5 | 5 | 0 | 0 | 0 |
| Lincoln (Me) | 258 | 444 | 444 | 0 | 104 | 54 | 38 | 46 | 22 | 0 | 1 | 40 | 153 | 153 | 190 | 0 | 0 |
| Knox (Me) | 256 | 392 | 392 | 0 | 150 | 64 | 5 | 123 | 56 | 0 | 86 | 62 | 38 | 38 | 0 | 0 | 55 |
| Waldo (Me) | 35 | 20 | 20 | 0 | 2 | 2 | 0 | 0 | 0 | 4 | 1 | 30 | 3 | 3 | 0 | 0 | 0 |
| Hancock (Me) | 250 | 672 | 672 | 0 | 53 | 24 | 5 | 68 | 67 | 0 | 209 | 451 | 362 | 362 | 150 | 0 | 0 |
| Washington (Me) | 156 | 231 | 231 | 26 | 67 | 16 | 91 | 78 | 65 | 0 | 75 | 475 | 363 | 363 | 65 | 0 | 0 |
| Me. Sub-Totals | 1625 | 2205 | 2205 | 33 | 761 | 479 | 167 | 317 | 210 | 0 | 379 | 1188 | 961 | 961 | 405 | 0 | 95 |
| Total (Both States) | 1719 | 2261 | 2246 | 33 | 861 | 579 | 167 | 317 | 210 | 0 | 390 | 1188 | 961 | 961 | 405 | 0 | 95 |

Groundfishermen

In 1978, there were approximately 761 full-time fishermen in Maine and about 100 in New Hampshire engaging in groundfishing. In Maine, groundfish was the major fishery for 479 of these people (about 63 percent), while the remaining 282 (37 percent) did groundfishing only a smaller part of the year. In New Hampshire, all the people who went groundfishing had groundfish as their major fishery.

Largest total numbers of groundfishermen are concentrated in New Hampshire, York County and Cumberland County of Maine. In these counties, a high percentage of those going for groundfish are involved in this as their major fishery--100 percent in New Hampshire and York County and 78 percent in Cumberland County. Further east along the coast, groundfishing is more of a seasonal activity carried on by fishermen who are mainly involved in other fisheries. In the mid-coast counties (Sagadahoc, Lincoln, Knox, and Waldo) some 51.4 percent of fishermen going for groundfish are in it as their major fishery, while in the east (Hancock and Washington Counties) the figure is only 33.3 percent. These figures on employment characteristics reinforced our earlier discussion concerning the uneven areal distribution of groundfishing, as indicated by locations of groundfish boats (Tables 4, 5, and 6).

Those for whom groundfish was not the major industry, or who landed groundfish as incidental catch, were distributed as follows, according to the 1978 port survey; all of these are Maine fishermen.

TABLE 9
Fishery Switching (into Groundfish), 1978

| <u>Major Fishery</u> | <u>No. Switching into Groundfish</u> | <u>Percent</u> |
|----------------------|--------------------------------------|----------------|
| Lobster | 146 | 51.7% |
| Redfish | 95 | 33.7% |
| Herring | 26 | 9.2% |
| Scallops | 4 | 1.4% |
| Combined* | <u>11</u> | <u>3.9%</u> |
| Total | 282 | 100.0% |

*In the eastern part of Maine, especially in the Eastport-Lubec area, fishermen may be involved in multiple fisheries over the course of the annual cycle: lobstering, herring fishing, longlining or handlining groundfish, etc.

As can be seen from Table 9, the largest number of people switching into groundfishing are lobstermen (51.7 percent). Most of these men give up lobstering in the spring and go groundfishing. The ten redfish boats, with their large crews, form the second largest group (33.7 percent). For these boats and crew, substantial amounts of groundfish are being landed as by-catch in the directed redfish fishery. Given current restrictions on redfishing areas because of Canada's extension of its 200 mile territorial limit, these redfish boats are likely to be landing increasing amounts of groundfish in the future. The people who switched in from herring in 1978 were all on six pair trawlers, except for one who works on a purse seiner.

It is interesting to note that those who are pursuing groundfish as their major fishery do not do much switching to other species. In 1978 only about 80 men out of 579 (13.8 percent) went after other species, the largest number, 32 (40 percent) for herring. Most of those who did herring fishing went purse seining, using the same boats they did for groundfishing. Only a few used stop seines and let their larger boat remain idle. These figures do not, of course, take into account shifts in species mix pursued within the general groundfish category.

TABLE 10

Fishery Switching (From Groundfish), 1978

| <u>Into:</u> | <u>Number Switching Out of Groundfish</u> |
|-------------------|---|
| Herring | 32 (40%) |
| Lobster | 19 (23.8%) |
| Scallops/Mussels | 11 (13.7%) |
| Tuna or Swordfish | 15 (18.7%) |
| Combination* | 3 (3.8%) |
| Total | 80 (100.0%) |

*Lobster, herring, scallops

Lobstermen

In 1978, there were about 2205 full-time lobster fishermen in Maine and 56 in New Hampshire. The vast majority of them had lobster as their major fishery. Only a handful of fishermen who are mainly in another fishery shift into lobstering for a part of the year, the largest number (15) being on three New Hampshire groundfish boats. Part-time fishermen account for a significant proportion of lobstermen in some areas, most notably in New Hampshire and Maine's two western counties, where about 61 percent are part-timers.

TABLE 11

Part and Full-Time Lobstermen, by Region

| | <u>Total Lobstermen</u> | <u>Part-Time</u> | <u>Percent Part-Time</u> |
|------------|-------------------------|------------------|--------------------------|
| West Coast | 1176 | 717 | 61 |
| Mid Coast | 1492 | 596 | 40 |
| East Coast | 1309 | 406 | 31 |

In the west coast area, where employment opportunities are very good, lobstering tends to be more of a recreational fishery than it is elsewhere. While the part-time skiff fishermen may sell part of their catch, they do not rely on lobstering as a source of income to any great extent. In the

mid and east coast areas, on the other hand, part-timers are well outnumbered by full-timers. Here, employment opportunities are much poorer, so those who do lobstering are much more apt to be full-time fishermen.

More and more Maine lobstermen in recent years have begun to engage in other fisheries for part of the year. In 1978, no full-time New Hampshire lobstermen did anything but lobstering. Table 12 summarizes total numbers and percentages of Maine lobstermen who engaged in other fisheries in 1978 (here termed "switchers").

TABLE 12
Percentage of Full-Time Maine Lobstermen Engaging in Other Fisheries,
By County (1978)

| <u>County</u> | <u>Total "Switchers"</u> | <u>Total Lobstermen</u> | <u>% Switching</u> |
|---------------|--------------------------|-------------------------|--------------------|
| York | 3 | 134 | 2.2 |
| Cumberland | 38 | 281 | 13.5 |
| Sagadahoc | 4 | 43 | 9.3 |
| Lincoln | 55 | 444 | 12.4 |
| Knox | 123 | 392 | 31.3 |
| Waldo | 3 | 20 | 15 |
| Hancock | 189 | 672 | 28.1 |
| Washington | <u>126</u> | <u>231</u> | <u>54.5</u> |
| Total | 541 | 2205 | 24.5 |

The largest amount of fishery switching is in Washington County, where over one-half of the lobstermen in 1978 shifted seasonally to other fisheries. Most switched to scallops or groundfish, but some to clams or herring. Knox and Hancock Counties also had fair proportions of lobstermen doing other kinds of fishing (about 31 percent and 28 percent, respectively). Here, the seasonal fishery was more apt to be scallops, with some in groundfish. However, a number of fishermen in Knox County fished for herring part of the year. (Tables 13 and 14 examine in detail the fisheries lobstermen switched into.) In Maine, the lobster fishermen of York County did the least amount of switching. Here lobstermen followed a seasonal cycle much like those of neighboring New Hampshire.

TABLE 13
Fishery Switching, From Lobster, 1978 (Maine Totals)*

| <u>Into</u> | <u>Number of People Switching Out of Lobstering</u> |
|--------------------|---|
| Scallops | 277 (51.2%) |
| Groundfish | 156 (28.8%) |
| Herring | 70 (12.9%) |
| Tuna, Swordfish | 24 (4.4%) |
| Clams | 13 (2.4%) |
| Combined Fisheries | 1 (.02%) |
| Total Switching | 541 (Total Full-Timers: 2205) |

*No full-time lobstermen in New Hampshire did anything other than lobstering.

TABLE 14

Fishery Switching, From Lobster, By County, 1978*

| County | Scallops | Groundfish | Into Fishery: | | Clams | Combined |
|------------|----------|------------|---------------|-------------------|-------|----------|
| | | | Herring | Tuna or Swordfish | | |
| York | 0 | 3 | 0 | 0 | 0 | 0 |
| Cumberland | 0 | 18 | 6 | 14 | 0 | 0 |
| Sagadahoc | 0 | 3 | 0 | 0 | 0 | 1 |
| Lincoln | 4 | 34 | 7 | 10 | 0 | 0 |
| Knox | 157 | 22 | 44 | 0 | 0 | 0 |
| Waldo | 3 | 0 | 0 | 0 | 0 | 0 |
| Hancock | 158 | 30 | 1 | 0 | 0 | 0 |
| Washington | 55 | 46 | 12 | 0 | 13 | 0 |

*No full-time lobstermen in New Hampshire did anything other than lobstering

Herring Fishermen

In 1978, about 484 men were engaged either full or part-time in the Maine herring fishery; there were no New Hampshire herring fishermen. Of these, about 317 were full-time fishermen, while another 167 were part-timers. (These figures include those employed on carriers, which have a two person crew.) Of the 317 full-time fishermen, about 210 had herring as their major fishery, while the remainder had some other fishery as their major one.

The 210 men for whom herring was the major fishery were primarily those working on purse seiners, pair trawlers, or carrier vessels. As previously described, because of the vagaries of herring movements, stop seine and weir owners and crews can, and usually do, engage in other kinds of fishing. Those who did not derive a major portion of their income from fishing are classed as "part-timers." Almost all of these men worked on stop seines and weirs.

These figures on full and part-time herring fishermen need some interpretation. In any given year, proportions of people in these various categories can shift drastically. If herring are scarce, fewer full-timers would have herring as a major fishery, and more men might shift into the "part-time" category if they worked more at non-fishing activities. In a good year, the reverse would occur.

Given the seasonal nature of herring fishing, one might predict that there would be a good deal of shifting by herring fishermen into other fisheries. In actuality, those whose major fishery is herring do not shift into other species over the course of the annual round as much as one might expect. Only 45 of the approximately 210 herring fishermen (21.4%) went after other species, over half (57.8%) for groundfish. (Almost all of these were on pair trawlers or purse seiners).

TABLE 15

Fishery Switching (From Herring), 1978

| Into | Number Switching From Herring | Percent |
|------------------------|-------------------------------|---------|
| Groundfish | 26 | 57.8 |
| Scallops | 12 | 26.7 |
| Lobster and Groundfish | 7 | 15.5 |
| Total | 45 | 100 |

Scallop Fishermen

Except perhaps for an occasional crewman who may do other, non-fishing work, there are no part-time fishermen who go for scallops. The majority of scallop fishermen are employed seasonally in this fishery, and they derive the larger portion of their income from some other fishery. Table 16 below gives approximate total numbers of scallop fishermen, by county in 1978; it also shows the numbers who do scalloping as their major fishery. Nearly all of the latter do scalloping year round, but there was one scallop boat with a four man crew in 1978 that also did some groundfishing. As described earlier, a boat that is fully rigged for scalloping with booms, winches, shucking house, etc. is difficult to re-rig for other fisheries. It is therefore not surprising that so few boats with scallops as the major fishery switch into other fisheries during a given year.

TABLE 16

Scallop Fishermen, by County, 1978

| <u>County</u> | <u>Number with Scallops Major Fishery</u> | <u>Total Scallop Fishermen</u> |
|---------------|---|------------------------------------|
| Rockingham | 11 | 11 |
| York | 0 | 0 |
| Cumberland | 0 | 3 |
| Sagadahoc | 0 | 1 |
| Lincoln | 0 | 1 |
| Knox | 29 | 86 |
| Waldo | 1 | 4 |
| Hancock | 39 | 209 |
| Washington | <u>20</u> | <u>75</u> |
| Totals | 100 | 390 |

Clammers

It is extremely difficult to estimate numbers of people involved in harvesting clams, and their degree of participation in the fishery. Unlike the situation in most of the other fisheries described here, part-time and recreational fishermen probably far outnumber full-timers. Furthermore, even the definition of full-time fisherman we have been using in this study may not apply in the clam industry, i.e. a full-time fisherman being one who derives the largest portion of his yearly income from fishing activities. There are certainly full-time clammers who do in fact derive the majority of their yearly incomes from clamming. However, there are also a fair number of people who consider themselves clammers, and who are so-considered by others in their communities, who do not actually derive over half their yearly incomes from clamming. Many of these are individuals who work at a variety of non-fishing jobs, and/or receive unemployment compensation for part of the year. For them, while clamming may not provide over half their income, it may nonetheless be their single largest income source.

Largest numbers of full-time clammers are in Washington and Hancock Counties, followed by Lincoln County (Table 8). The largest numbers of part-timers are also in Washington and Hancock Counties, but Cumberland and Knox Counties surpass Lincoln in total numbers of part-timers. There were virtually no soft-shell clammers in New Hampshire or in York County in 1978. There are few clam flats in this area; in New Hampshire only recreational clam digging is allowed by law.

TABLE 17

Part and Full-Time Clammers, By Region*

| | <u>Total Clammers</u> | <u>Part-Time</u> | <u>Percent Part-Time</u> |
|------------|-----------------------|------------------|--------------------------|
| West Coast | 147 | 110 | 74.8 |
| Mid Coast | 351 | 152 | 43.3 |
| East | 1651 | 926 | 56.1 |

*Soft-shell clams only. A very small number of fishermen fished for surf clams. Figures are for Maine only, since there were no N.H. clammers.

Obviously, the distribution of full-time clammers along the coast is related to a great degree to the distribution of major open clam producing flats: the easternmost two counties in Maine have over 50 percent of the state's total clam growing areas, and well over 50 percent of the serious, full-time diggers as well. However, local economic conditions also play a role in influencing the distribution of diggers. In the eastern part of Maine, where alternate economic opportunities are few, many people turn to part-time or seasonal clamming, combined with other fishing and non-fishing activities such as herring fishing, work in the woods or seasonal employment in tourist-related businesses. In York, Cumberland, and Sagadahoc Counties, by way of contrast, the number of full-time clammers is nowhere near as great as might be predicted on the basis of available clam-growing areas alone. Since economic opportunities are so much better in this area, individuals do not have the need to turn to clamming to supplement their income from other sources. It should be noted, however, that clammers in recent years have been willing to travel fairly long distances to reach open flats. Thus, flats in the western coastal counties may be being dug by clammers who are not residents of the county in which they are digging. Furthermore, these western flats are subjected to a great deal more recreational part-time digging than those in the east, where tourism and the summer cottage business are not as developed.

FISHERY SWITCHING: AN OVERALL VIEW

From the port descriptions and our general discussion here, it should become apparent that fishermen in many parts of northern New England do not confine themselves to a single fishery but, rather, switch fisheries over the course of the year. This fishery switching is determined by two major sets of factors: annual cycles of the species and economic. Various state and Federal management regulations are also coming to play an increasing role in fishermen's decisions to remain in or switch fisheries during a given year.

The fisherman is obviously bound by the seasonal rhythms of the species he pursues, and it is simply not possible to harvest all species all year round. The most important biological factors include the inshore movements of juvenile herring in the late spring and summer, the decrease in lobster activity during the winter, and the movement of groundfish species to inshore waters during the spring.

For the fisherman who has a large investment in boat and gear, switching to various species has become almost a necessity if his target species is unavailable or difficult to harvest at a given season; he simply cannot afford to let his boat remain idle. There are thus often pressing economic reasons to switch species. Interestingly, the larger a boat a man has, the more versatile he is able to be. However, the majority of fishermen who switch species over the course of the annual cycle are lobstermen who go scalloping or groundfishing; most of these men have relatively small boats, in comparison with those who pursue these species as their major fishery.

Aside from the economics of fishing itself, local economic factors also play a role in influencing fishery switching and switching to non-fishing occupations. In the eastern part of Maine, where alternate economic opportunities are few, it is common for individuals to pursue several fisheries (especially herring fishing, clamming, lobstering, or handlining or long-lining for groundfish), along with non-fishing occupations, in order to put together an adequate income over the course of

the year. In the mid-coast region, fewer fishermen pursue non-fishing occupations, but a good many lobstermen switch into scalloping or groundfishing, and some into herring fishing.

The least amount of fishery switching in the region is in York County and in New Hampshire where the major fisheries are confined almost exclusively to groundfish and lobsters. In the Portland area, also, there is very little switching. While there is no complete explanation for this, several factors apparently play a role. First, even though spring lobstering here is not much better than elsewhere in the region, switching to groundfishing during this season is not as viable an option for lobster fishermen here as it is elsewhere. The closest groundfish areas are out so far that it would be dangerous or impractical for small lobster boats to exploit them. Second, in this west coast region, people who go groundfishing are able to go year round, and do not have to shift into other fisheries. This is because the average groundfish boat in this area is much larger, newer, and capable of operating further off-shore or in rougher weather than the majority of boats in the east and mid coast regions. Finally, in the west coast region there is no good local scalloping, and few places for herring weirs or stop seines. Thus, it is not likely that boats from this area will switch from their major species and go for scallops or herring, unless they choose to operate in other areas for the duration of the scallop season or herring season.

MARKETING AND PROCESSING ISSUES

As we have seen, marketing procedures vary depending on the species. Currently, lobstermen, clambers, herring fishermen, wormers, and scallopers have little problem marketing their catches. The same is not the case for groundfishermen, who have chronic problems getting their catches to market. Serious consideration is being given to establishing an auction in Portland, which would help in groundfish marketing immensely. New fish piers proposed for Portland and elsewhere should also be of help to groundfishermen.

From the point of view of herring, groundfish, and fishmeal processors, there are real supply problems. For example, even though large amounts of herring are landed in Maine, there are times when there is not enough herring available to keep the canneries in operation during the herring season. Imports of Canadian herring are used to ease this supply problem, and in some years this Canadian volume has been very high. From a regional point of view, while herring processing facilities are concentrated in the east, there are also a good number of plants elsewhere. These plants are kept supplied from plants further east by truck or by sardine carrier from catches made anywhere along the coast; they will also process fish coming in from Canada. Indeed, it would probably be possible to supply most Maine herring plants almost entirely from Canadian waters, at least for short periods, if that became necessary.

Employment in herring processing plants is highly seasonal. Even during herring season not all plants are always working up to capacity. However, since most of the plants are in areas where alternate economic opportunities are limited, the herring industry is a crucial component of the local economy. In 1978 there were about 2293 people employed in herring processing in Maine. Some of the plants which also handled products other than herring (fish meal plants and those producing frozen groundfish fillets) remained in operation year round. Table 18 gives employment figures for the herring sector alone. Unfortunately, in the fish meal and oil plants it was not possible to separate out what proportion of the labor force was dependent on herring for their employment, so only the total plant figures are used.

TABLE 18

Employees in Herring Processing: Seasonal Maximum

| <u>Type of Plant</u> | <u>Peak Seasonal Employment (Herring)</u> |
|--|---|
| Canned sardines alone | 1312 |
| Canned products and frozen fillets | 275 |
| Frozen herring and groundfish fillets | 115 |
| Frozen herring fillets only | 355 |
| Herring by-products (meal, oil, pearl essence) | 232 |
| Smoking and pickling | ? (small) |
| Total | 2293 |

Groundfish marketing and processing is much more of a problem in northern New England than is her-
ring processing. In fact, maintaining an adequate flow of groundfish supplies is such a problem
for Maine and New Hampshire processors that the majority rely on fish imported from out of state,
from Canada, and even from other countries; foreign imports come in frozen block form. The Maine
and New Hampshire harvest of groundfish makes its way to market mainly in fresh form, either in
local retail establishments and restaurants or on the Boston or New York fresh fish markets. A few
small processors, especially in Portland, do handle Maine-caught groundfish for resale in frozen
form, breaded, etc. Most large processors, however, get the larger part of their supply from out
of state. As a result, some of the processing operations are not located in places where there are
large concentrations of groundfishing boats.

TABLE 19

Groundfish Marketing and Processing Personnel

| <u>County</u> | <u>No. Employees</u> (Groundfish Marketing & Processing) |
|-------------------|--|
| Rockingham (N.H.) | 370 |
| York (Me.) | 57 |
| Cumberland | 208 |
| Sagadahoc | 12 |
| Lincoln | 24 |
| Knox | 321 |
| Waldo | 0 |
| Hancock | 13 |
| Washington | 12 |

To illustrate the relative independence of the groundfish harvesting and marketing spheres in north-
ern New England, we note that in Knox County, there are only about 150 fishermen who earn any of
their income from groundfishing. However, about 321 people are employed in marketing and process-
ing--about 190 of them at a single plant (National Sea Products Corporation) in Rockland, which
uses little locally-caught groundfish. The same situation occurs in New Hampshire, where there are
approximately 100 groundfishermen but at least 370 marketing and processing personnel--same 350
are employed at the large Booth Fisheries plant in Portsmouth, which makes products only from im-
ported frozen fish blocks. The other concentration of groundfish processing facilities is in Port-
land, Maine. Here a good deal of the groundfish processed locally does come from local boats.
Nonetheless, even in Portland substantial amounts of groundfish are trucked into Portland's local
processors from Gloucester, Canada, and so on.

As a result of this separation of the groundfish processing and harvesting sectors, groundfishing
in Maine and New Hampshire might fail, and the processing sector could be largely untouched. On
the other hand, a change affecting the importation of frozen fish blocks would have a marked im-
pact on the processing sector--particularly plants in Rockland, Portsmouth, and Portland--and have
few repercussions for those manning Maine and New Hampshire boats.

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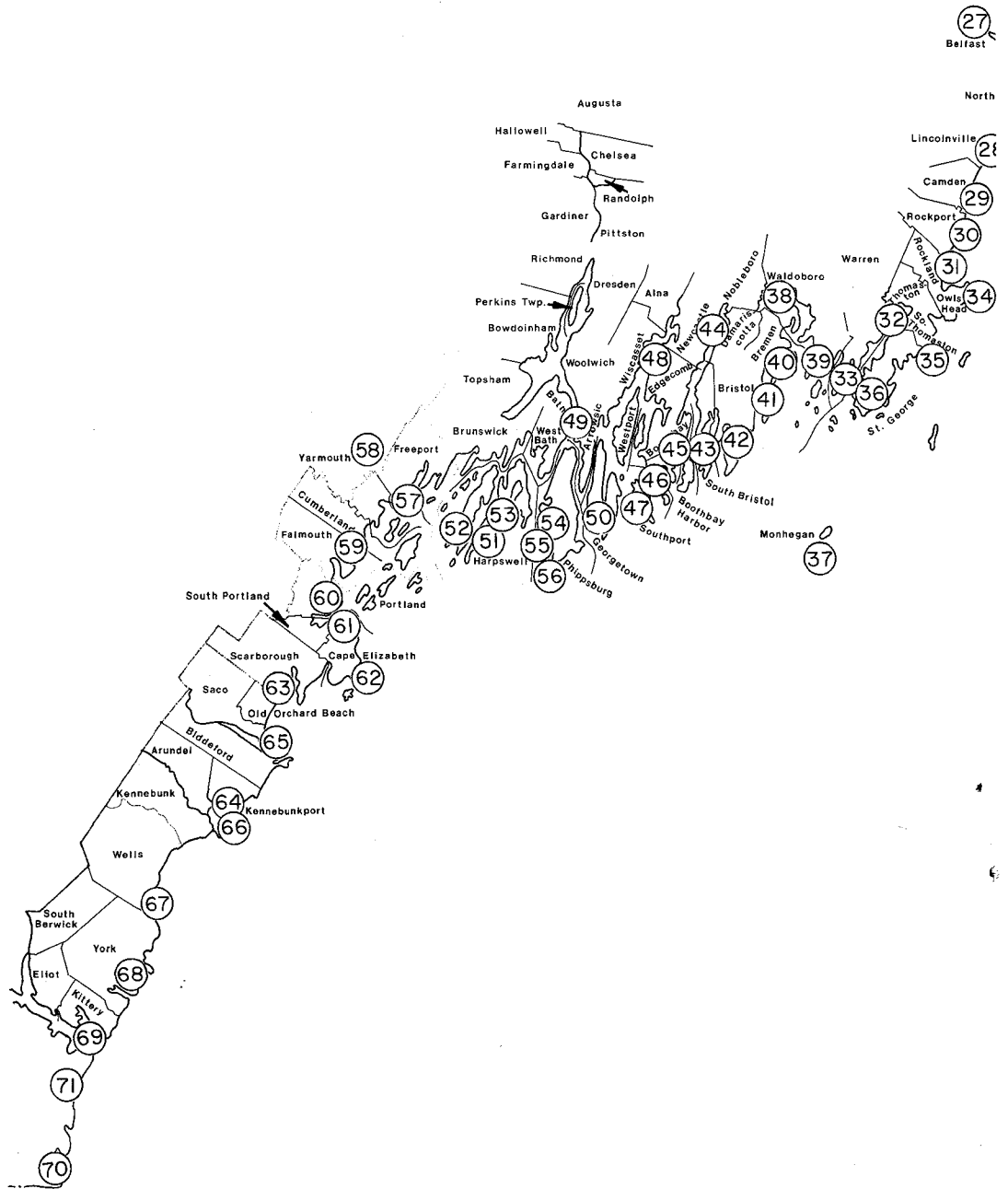
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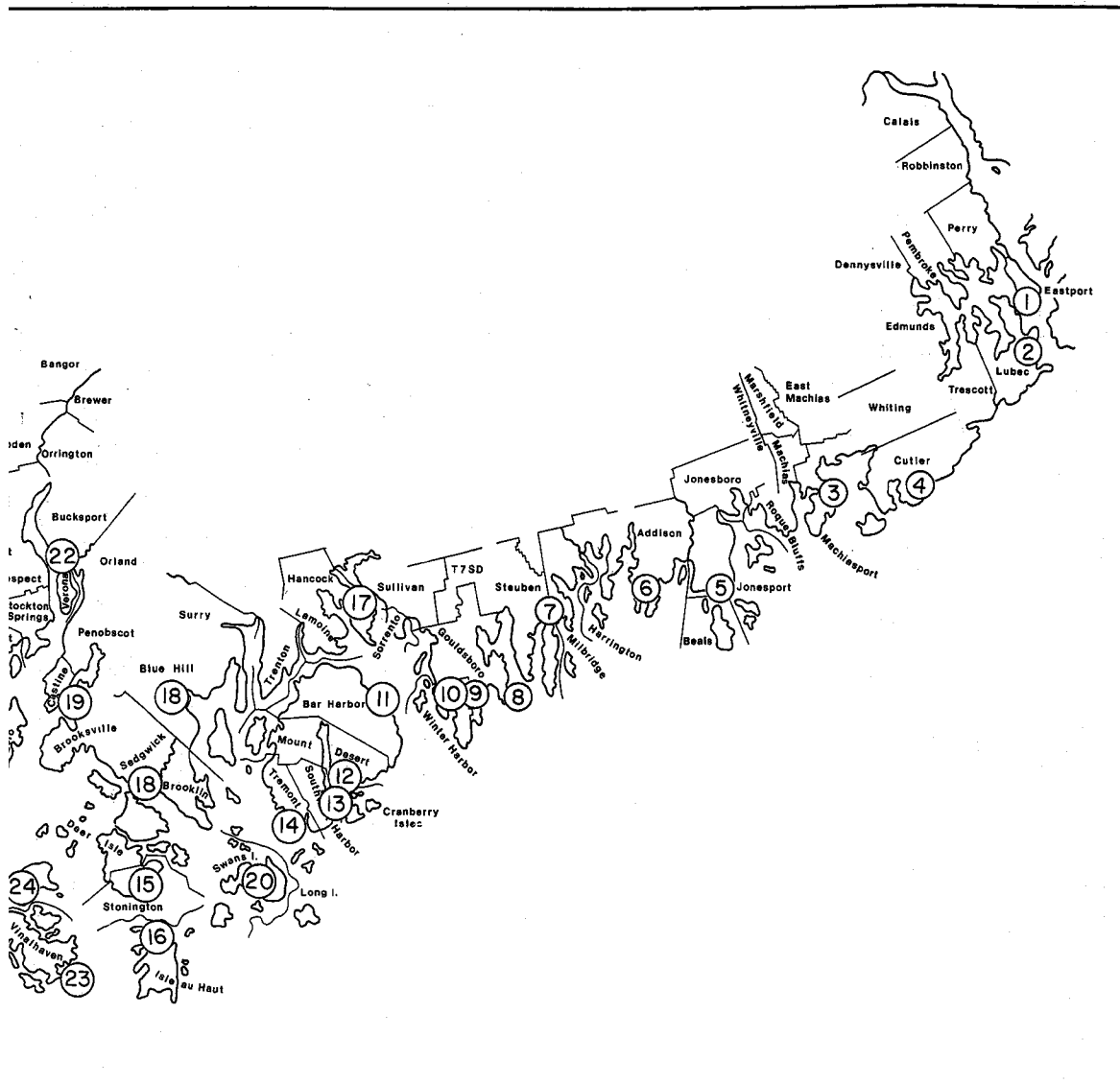
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- | | |
|-----------------------------------|---|
| 1. Eastport | 38. Waldoboro |
| 2. Lubec | 39. Friendship |
| 3. Machiasport-Bucks Harbor | 40. Bremen |
| 4. Cutler | 41. Round Pond |
| 5. Jonesport-Beals Island | 42. New Harbor and Pemaquid Harbor |
| 6. South Addison | 43. South Bristol |
| 7. Millbridge-Steuben | 44. Damariscotta-Newcastle |
| 8. Corea | 45. Boothbay (includes E. Boothbay) |
| 9. Prospect Harbor | 46. Boothbay Harbor |
| 10. Winter Harbor | 47. Southport |
| 11. Bar Harbor | 48. Wiscasset |
| 12. Northeast Harbor | 49. Bath |
| 13. Southwest Harbor | 50. Five Islands-Bay Point |
| 14. Bass Harbor | 51. Bailey Island (includes Orr's Island) |
| 15. Stonington | 52. Harpswell-South Harpswell |
| 16. Isle Au Haut | 53. Cundy's Harbor |
| 17. Hancock-Sullivan | 54. Sebasco Estates |
| 18. Blue Hill-Brooklin | 55. West Point |
| 19. Castine-Brooksville | 56. Small Point |
| 20. Swans Island | 57. South Freeport |
| 21. Searsport | 58. Yarmouth |
| 22. Bucksport-Verona Island | 59. Falmouth Foreside |
| 23. Vinalhaven | 60. Portland |
| 24. North Haven | 61. South Portland |
| 25. Matinicus-Criehaven | 62. Cape Elizabeth |
| 26. Islesboro | 63. Pine Point |
| 27. Belfast | 64. Cape Porpoise |
| 28. Lincolnville Beach | 65. Camp Ellis-Biddeford Pool |
| 29. Camden | 66. Kennebunkport |
| 30. Rockport | 67. Perkins Cove-Wells Harbor |
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| 33. Pleasant Point | |
| 34. Owls Head | |
| 35. Sprucehead | |
| 36. Port Clyde and Tenants Harbor | |
| 37. Monhegan | |

- New Hampshire
- | |
|----------------------------------|
| 70. Hampton Beach-Seabrook Beach |
| 71. Rye Harbor |





) Matinicus
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Figure 4
Fishing harbors and
townships along the coast
of Maine and New Hampshire

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