

**OFFSHORE GROUNDS
IMPORTANT TO THE UNITED
STATES HADDOCK FISHERY**

**RESEARCH REPORT 32
FISH AND WILDLIFE SERVICE
UNITED STATES DEPARTMENT OF THE INTERIOR**

ABSTRACT

This report presents information concerning the areas fished for haddock by the United States otter-trawl fleet over a 12-year period, 1938-49. A series of charts is included.

One chart shows the relative intensity of fishing over the areas fished for the entire study period. The most important grounds for the United States haddock fishery are on Georges Bank. About 82 percent of the fishing effort over the 12-year period was spent on this bank, the most heavily fished areas being Northern Edge, Southeast Georges, and the "Corner" between South Channel and Georges Bank proper. The remaining 18 percent of fishing effort was spread among the various Nova Scotian banks, particularly Browns Bank, Emerald Bank, Horse-shoe Ground, and around Sable Island.

Other charts show the relative intensities in each month of the year. The areas of most intense fishing varied in location from month to month. The relative importance of the Georges Bank grounds varied from a low in April when 63.5 percent of the total fishing effort was spent there, to a high in October when 94.2 percent of the effort was spent on these grounds.

OFFSHORE GROUNDS IMPORTANT TO THE UNITED STATES HADDOCK FISHERY

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OFFSHORE GROUNDS IMPORTANT TO THE UNITED STATES HADDOCK FISHERY

The fishing grounds that support the United States haddock fishery are among the most productive and important in the world and supply to United States fishermen alone more than 145 million pounds of haddock a year.

A study of this fishery is being made by biologists of the United States Fish and Wildlife Service to discover the causes of fluctuations in the landings, to determine whether anything can be done to increase production of this valuable fishery to a point nearer its former level, and to predict what catches may be expected.

Through the Atlantic States Marine Fisheries Commission and individuals in the industry, it recently came to our attention that, of the data being assembled in this study, the industry is particularly interested at this time in the location of the important haddock grounds. In response to this interest we present here information that defines precisely the location of the offshore haddock grounds important to the United States fishery, shows the relative importance of each ground, and shows how the important areas vary in location from season to season throughout the year.

The records presented here represent the first precise plotting of the location and relative importance of each of the offshore haddock grounds important to the United States fishery, although McKenzie (1946) has shown, in general terms, the grounds important to Canadian fishermen, and Rich (1930) and Alexander *et al.* (1915) defined, also in general terms, the grounds fished by the United States vessels for a number of species before 1930 and before 1915 respectively.

The original data reported upon here were collected by a number of biologists stationed at the port of Boston over a 12-year period, particularly Henry M. Bearse, Joseph M. Shuval, and James J. Miggins, and were tabulated in different years by Henry M. Bearse, Frank A. Dreyer, and Sterling L. Cogswell. The charts used to illustrate the text were prepared by Manuel Vieira. In addition to these people, I wish to thank the captains and mates of the Boston otter trawlers, without whose cooperation it would have been impossible to assemble the data; also Edmund L. Dunn, President of the New England Fish Exchange, and Thomas Fullham of the Massachusetts Fisheries Asso-

ciation, who reviewed the manuscript for accuracy of the terminology used. I wish also to thank the Atlantic States Marine Fisheries Commission, for suggesting that the data be made available in the form presented here.

METHODS

The data summarized here were collected according to the methods described by Rounsefell (1948). The summary is of the total fishing effort for haddock by the whole fleet of offshore otter trawlers that fished out of the port of Boston, Mass., the major haddock port in the United States. In size, these trawlers average about 200 gross tons, at present and range from about 110 to 315 gross tons. In length they average about 105 feet, with some as short as 85 feet and others as long as 130 feet. This type of vessel, which has gradually re-

placed the old-time line-trawl schooner in the haddock fishery, comprises the modern offshore fleet (fig. 1).

For each trawler trip, a record was made of the number of days¹ it fished for haddock in each location. A trawler was considered to have fished for haddock in a particular location when its catch from that location contained more haddock than any other species. For summarizing the data, a location was defined as a unit of area bounded by 10-minute lines of latitude and 10-minute lines of longitude.

The total number of vessel-days of fishing in the various unit areas for the 12 years from 1938 to 1949

¹ These values represent actual days of fishing and are exclusive of days spent running to and from the fishing banks and of days lost owing to breakdown, jogging in rough weather, and miscellaneous causes.

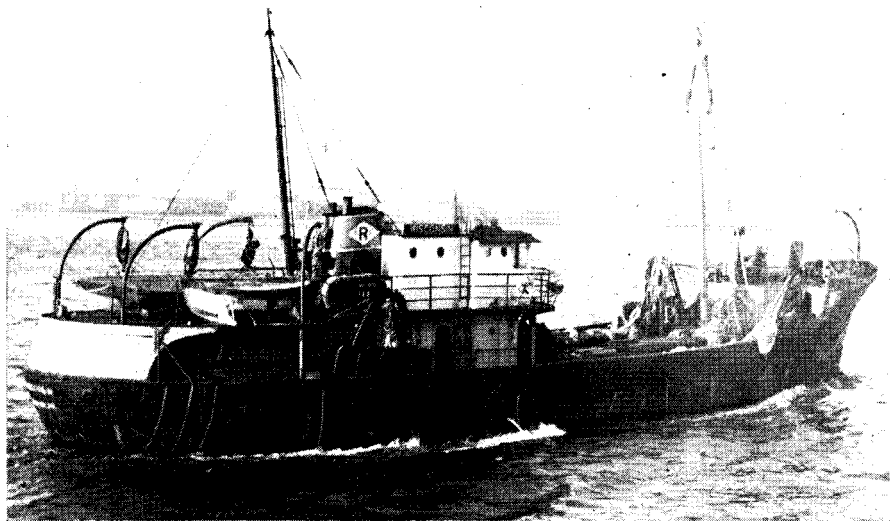


Figure 1.—Typical otter trawler of the Boston fleet.

were plotted on one chart (fig. 2) to show the distribution of the total fishing effort, and on 12 monthly charts (figs. 3-14) to show the distribution of fishing effort for each month separately. On the charts are indicated the areas of heavy, moderate, and light fishing. A unit area was considered heavily fished if it received 1.0 percent or more of the total fishing during the period, moderately fished if it received 0.5 to 0.9 percent, and lightly fished if it received 0.1 to 0.4 percent. Unit areas fished less than 0.1 percent of the total were not plotted.

DISTRIBUTION OF TOTAL FISHING EFFORT

From figure 2, showing the distribution of the total 12-year fishing effort (over 72,000 vessel-days), it can be seen that the grounds of most importance to the United States haddock fleet are in the Georges Bank area off the New England coast, although much fishing is done also on some of the banks off Nova Scotia. To the north or east of the area shown on this chart, fishing for haddock by United States otter trawlers is negligible, although haddock are found there and are taken in considerable quantities by vessels of other countries.

Areas heavily fished are (1) along Northern Edge extending to Northeast Peak on Georges Bank, (2) one area of Southeast Georges, (3) one area commonly known to fishermen as the Corner, between South Channel and Georges Bank proper,

and (4) one small area on eastern Nantucket Shoals.

Areas moderately fished are (1) large sections of Southeast Georges and Northern Edge, (2) Eastern Side and the "bottom" of South Channel, and (3) one small section of Browns Bank.

Areas lightly fished are (1) all of Georges Bank, including South Channel and eastern Nantucket Shoals, with the exception of the shoal-water central area and the deeper waters of Southwest Georges, (2) most of Browns Bank, (3) sections of Emerald Bank, (4) around Horseshoe Ground, and (5) some sections around Sable Island.

Of the 12-year fishing effort represented here, 82 percent (59,789 vessel-days) was spent on the Georges Bank grounds and 18 percent (12,831 vessel-days) was spent on the group of Nova Scotian banks.

SEASONAL CHANGES IN AREAS FISHED

There appear to be rather regular seasonal changes in the relative importance of the different grounds, as shown by the 12 charts (figs. 3-14) of the total fishing effort by months. For instance, although Northern Edge on Georges Bank supports the heaviest fishery for the year, it is overshadowed by Southeast Georges during most of the winter and spring, and is equaled or surpassed by South Channel in certain months. During the late winter and early spring almost as much effort is expended on Browns Bank as on Northern Edge.

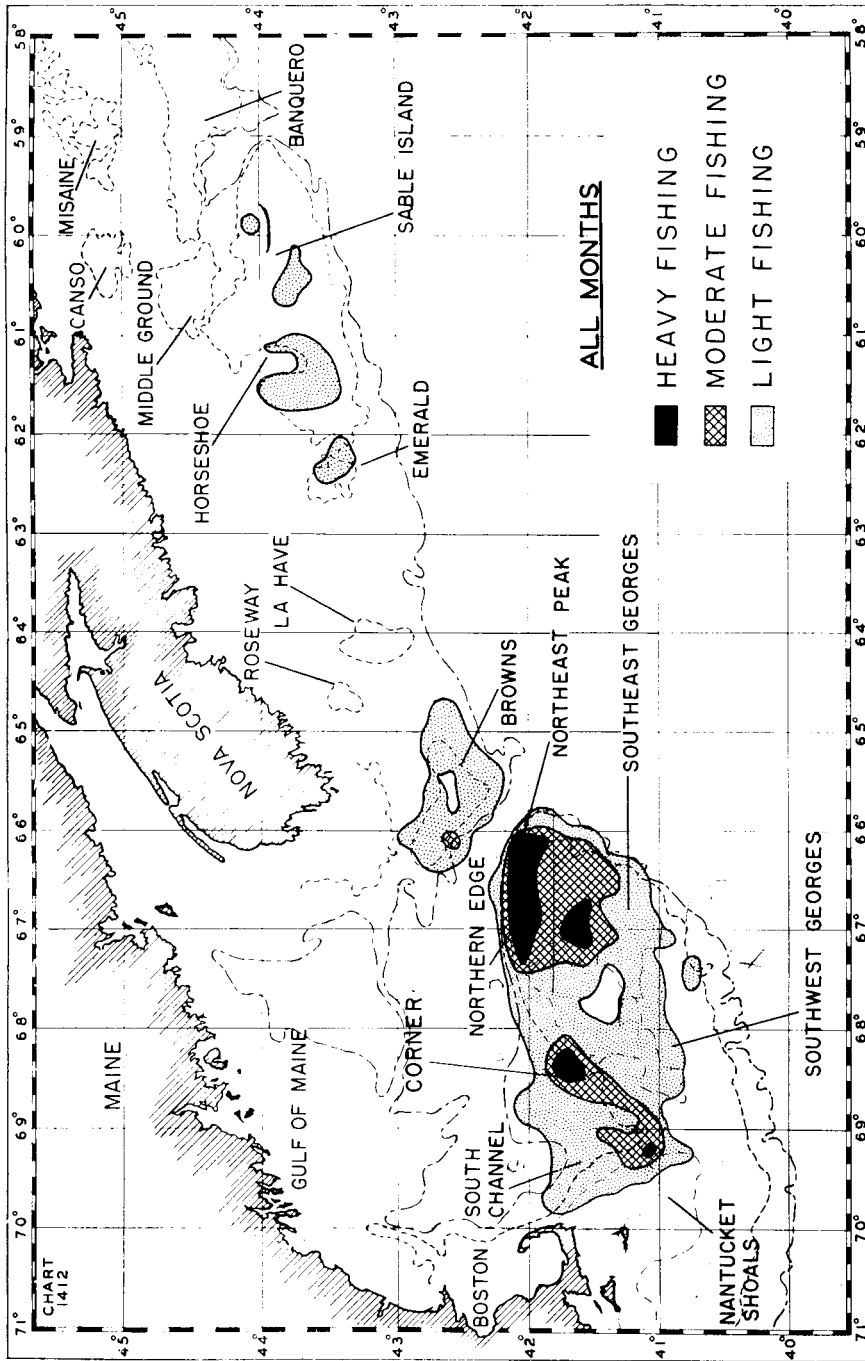


Figure 2.—Areas fished for haddock by Boston otter trawlers, 1938-49; All months.

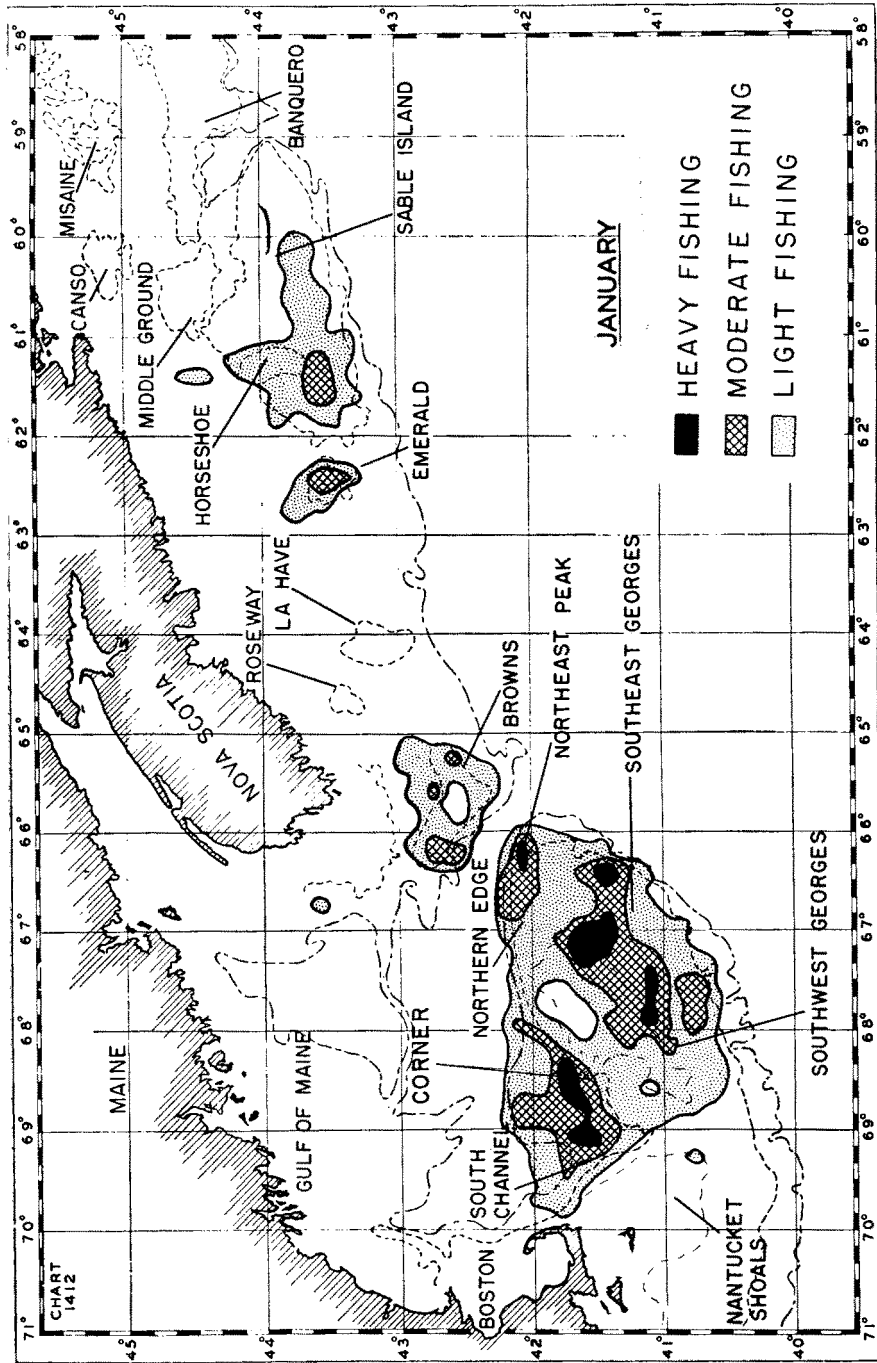


Figure 3.—Areas fished for haddock by Boston otter trawlers, 1938—49: January.

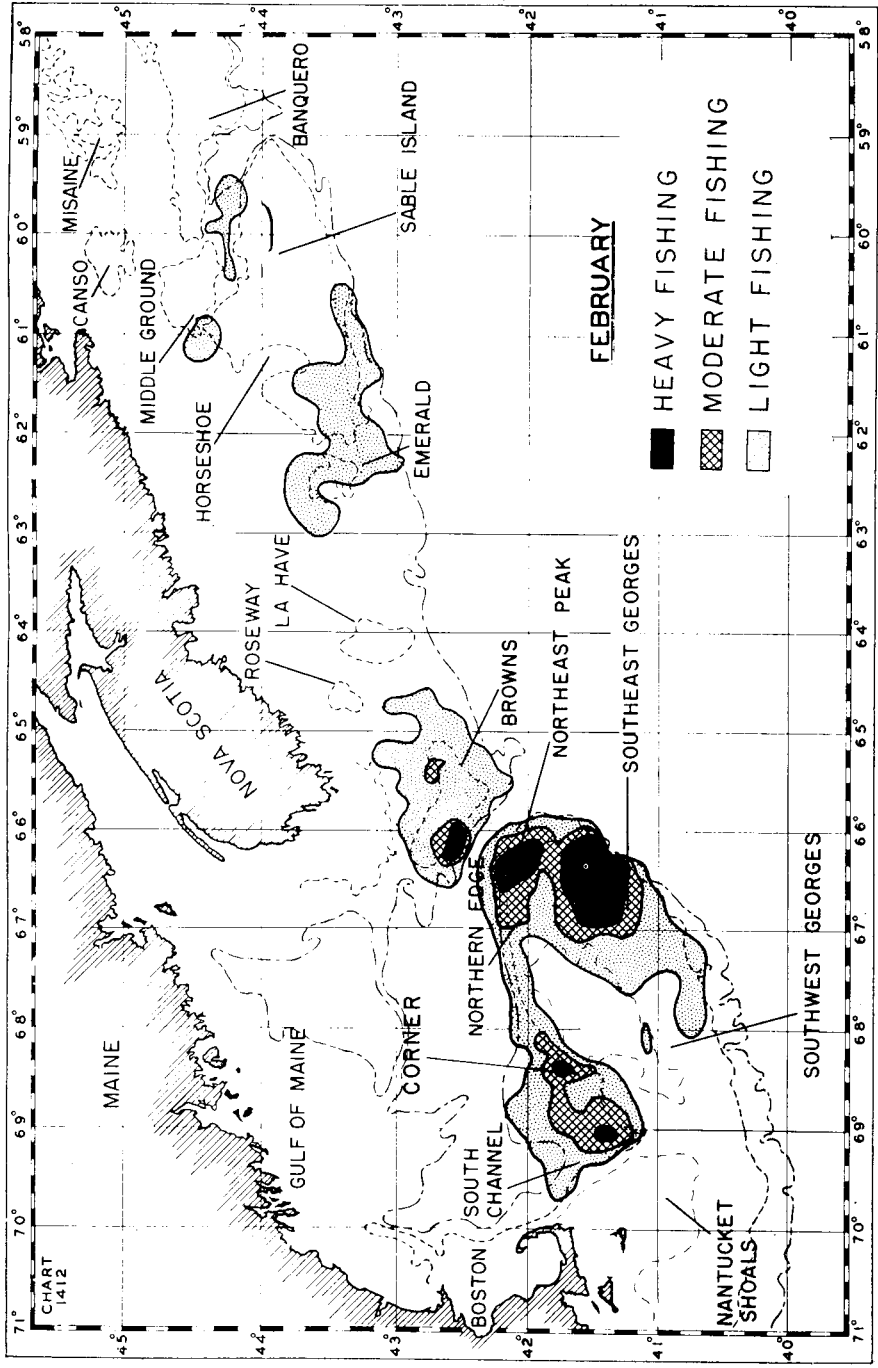


Figure 4.—Areas fished for haddock by Boston otter trawlers, 1938—49: February.

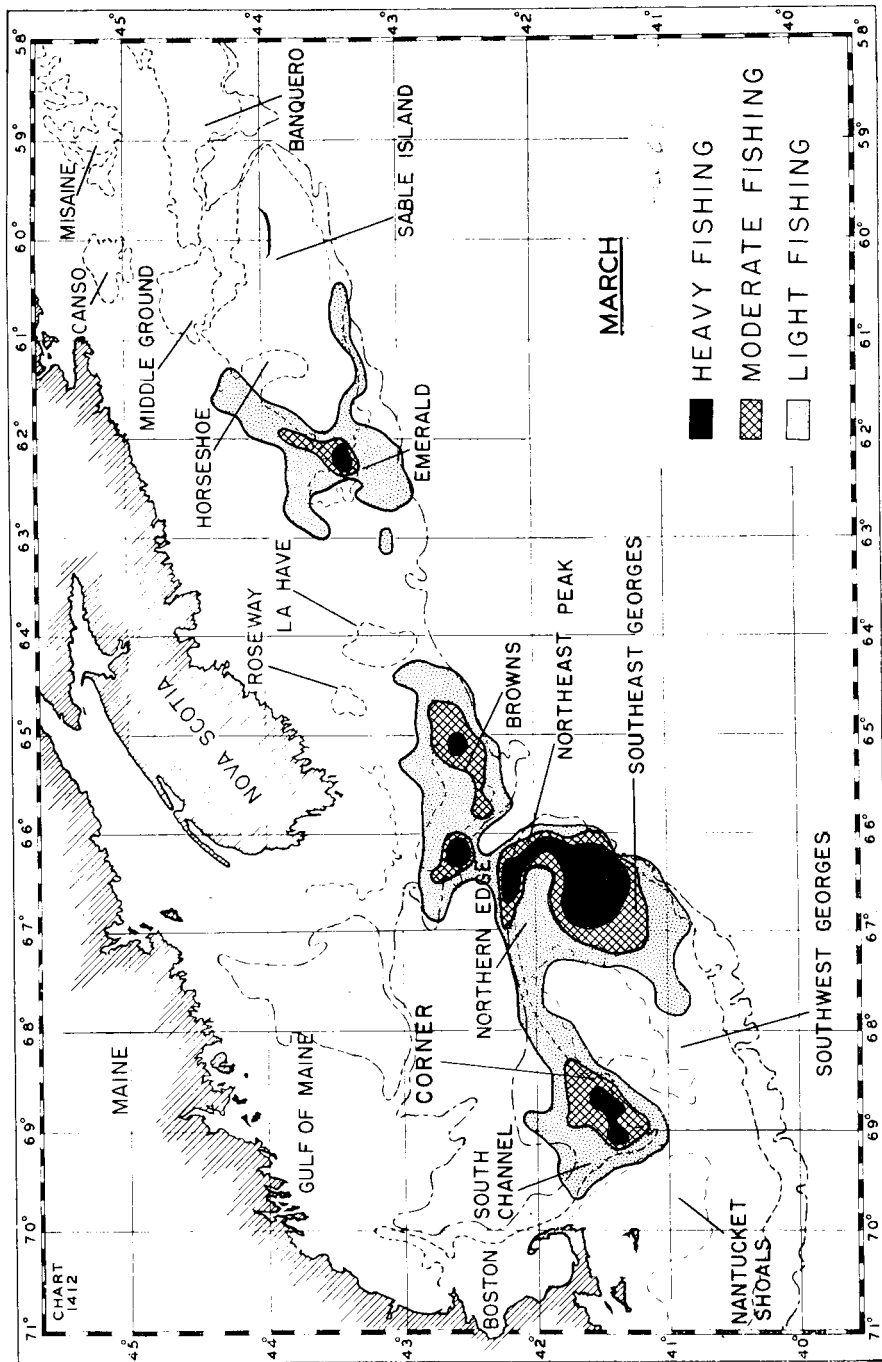


Figure 5.—Areas fished for haddock by Boston otter trawlers, 1938—49: March.

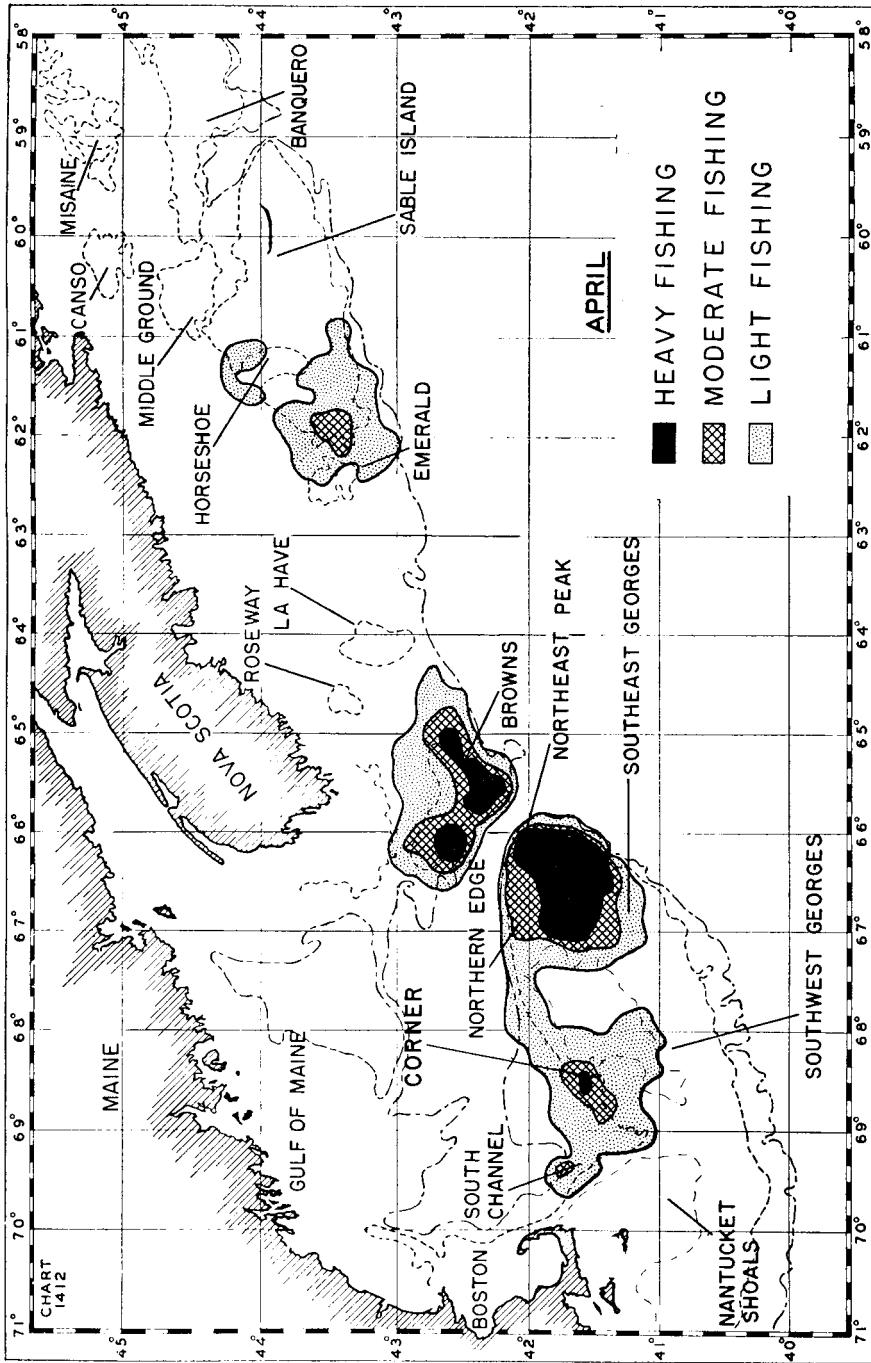


Figure 6.—Areas fished for haddock by Boston otter trawlers, 1938—49: April.

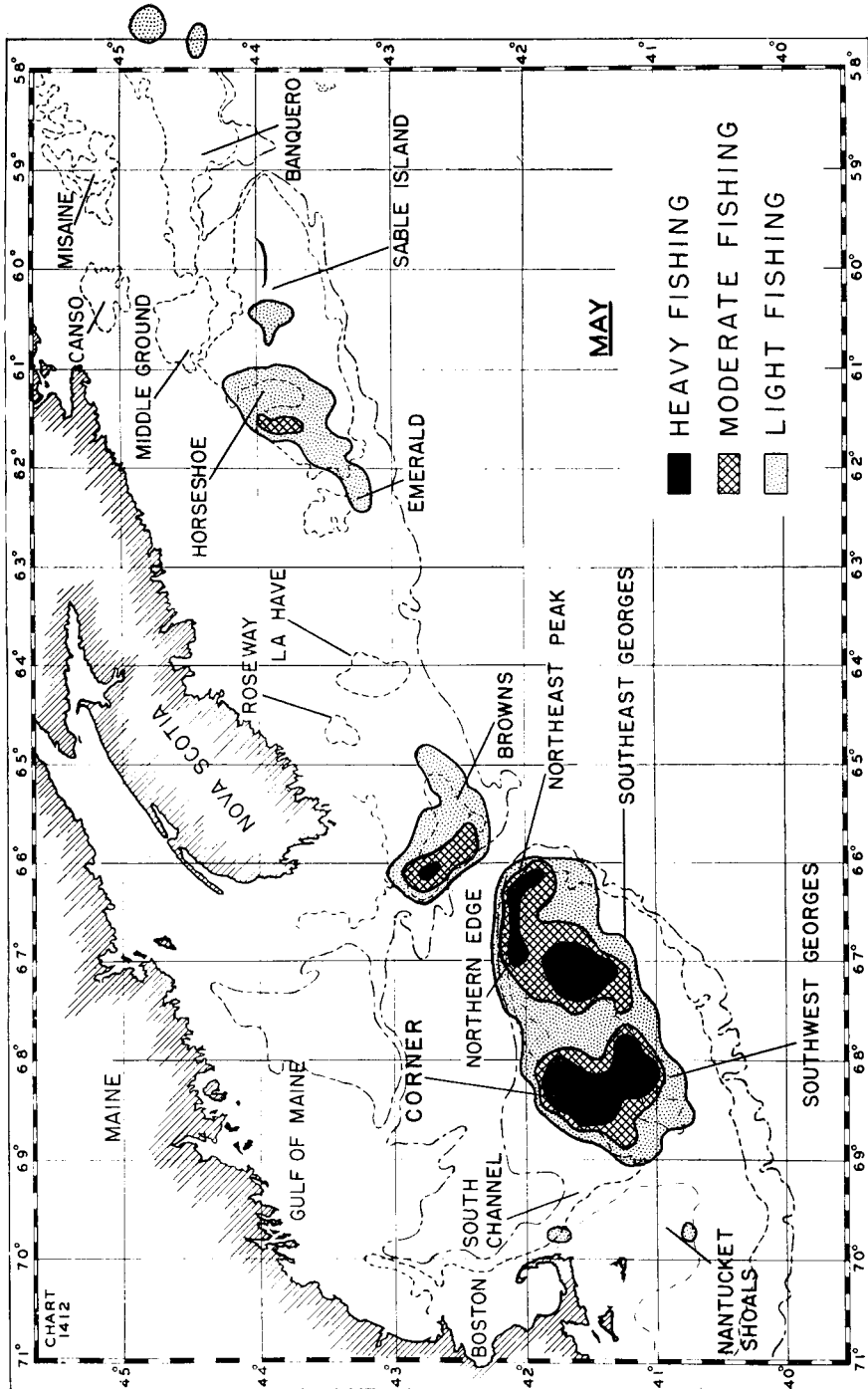


Figure 7.—Areas fished for haddock by Boston otter trawlers, 1938–49; May.

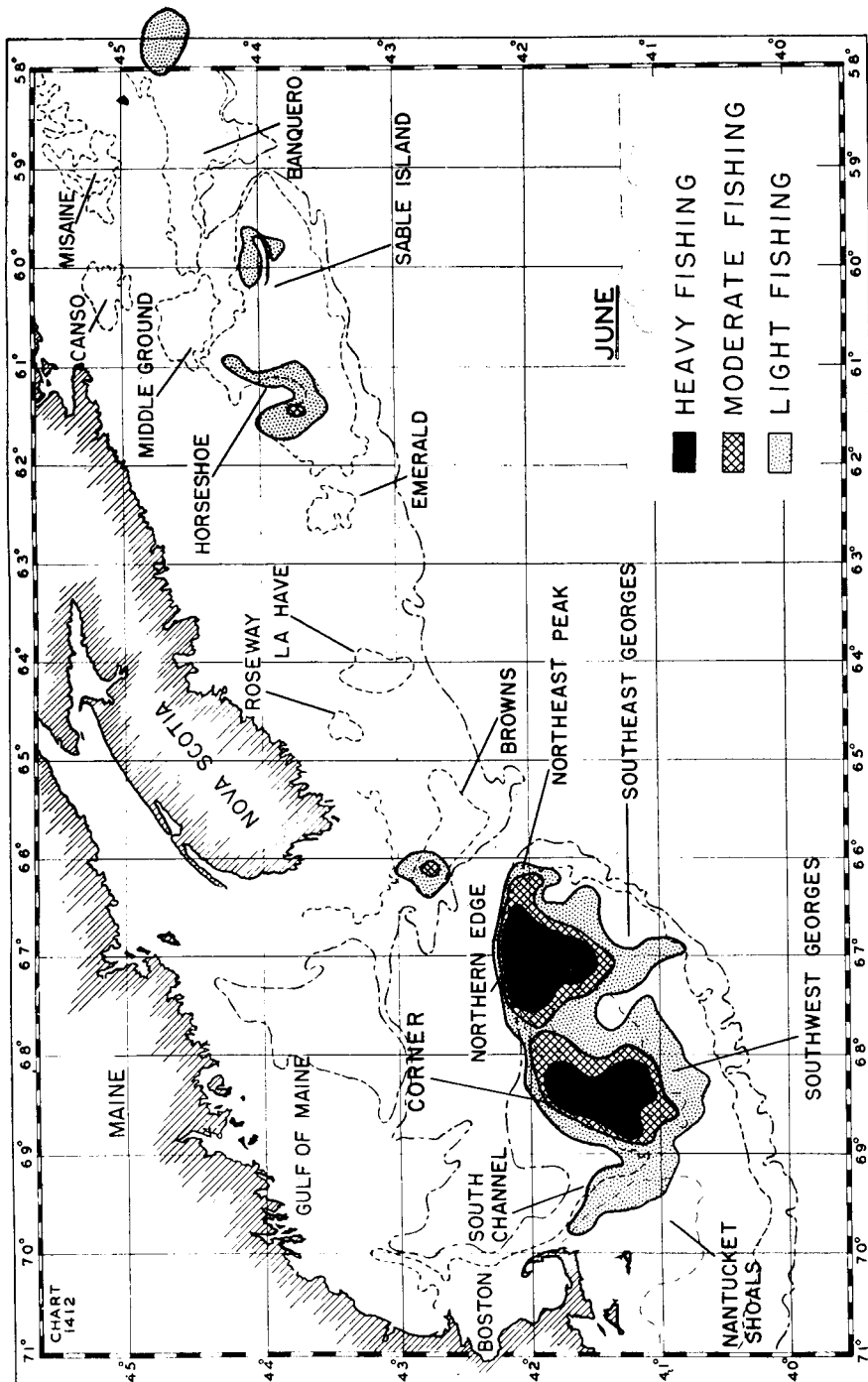


Figure 8.—Areas fished for haddock by Boston otter trawlers, 1938-49; June.

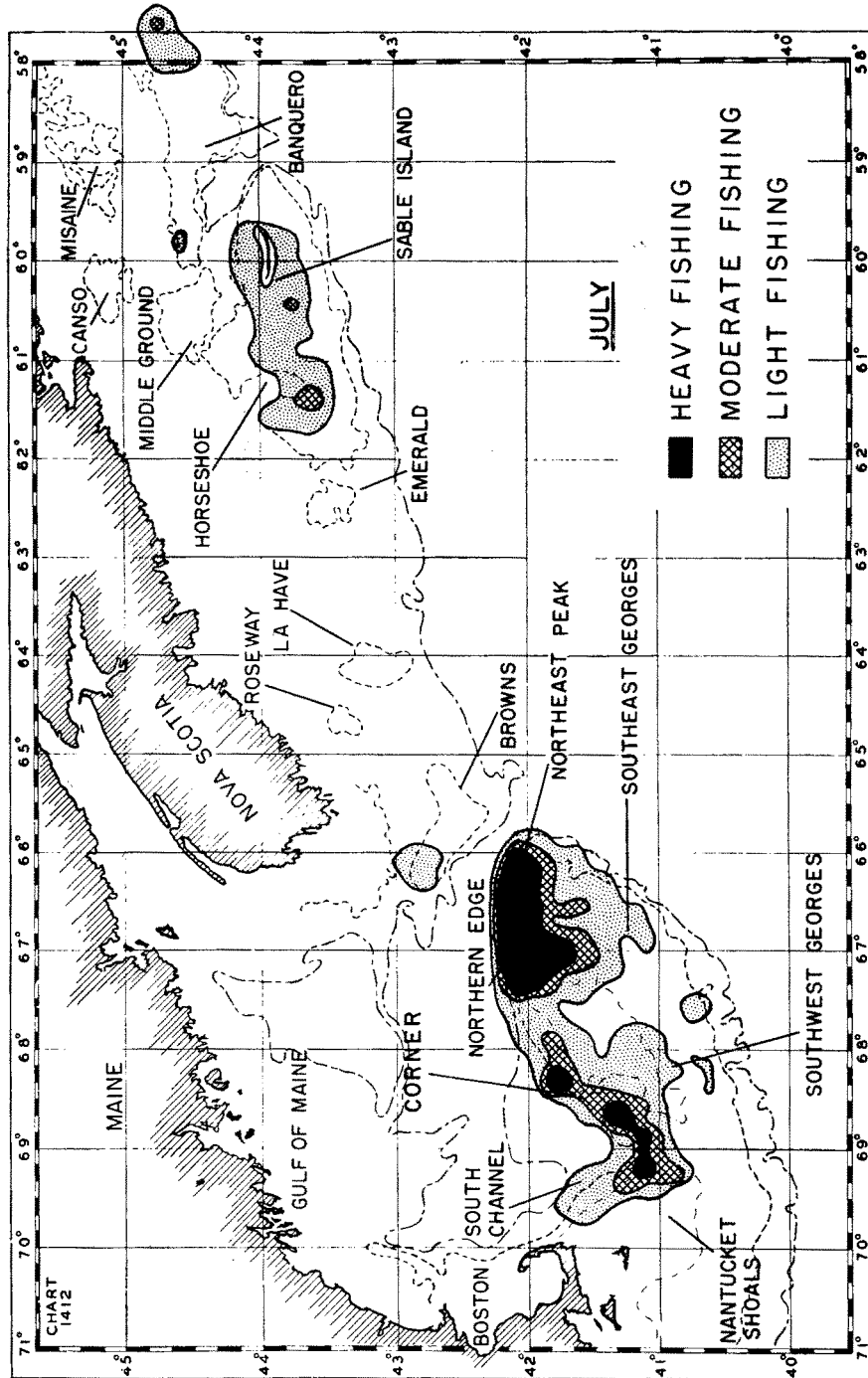


Figure 9.—Areas fished for haddock by Boston otter trawlers, 1938–49: July.

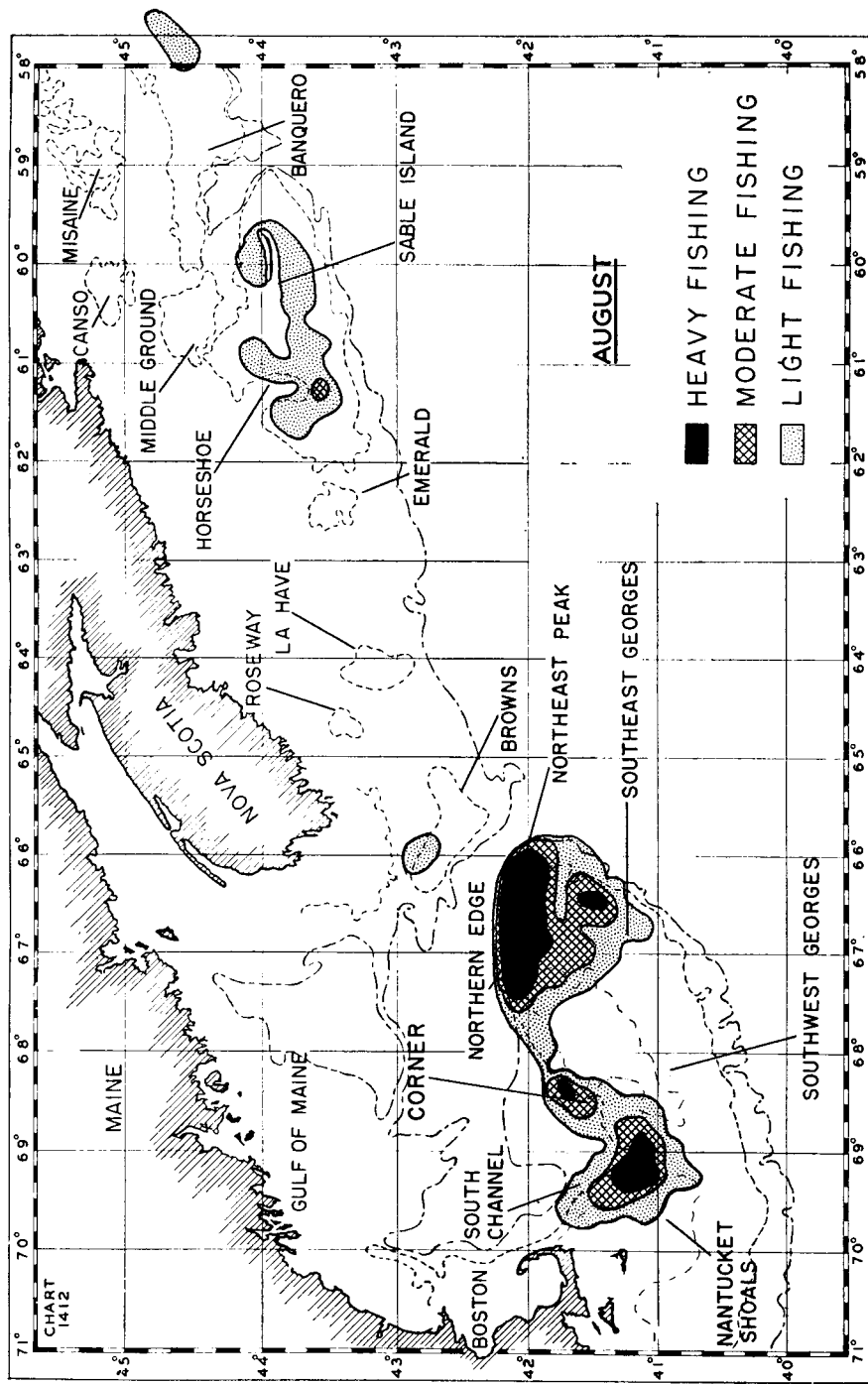


Figure 10.—Areas fished for haddock by Boston otter trawlers, 1938—49: August.

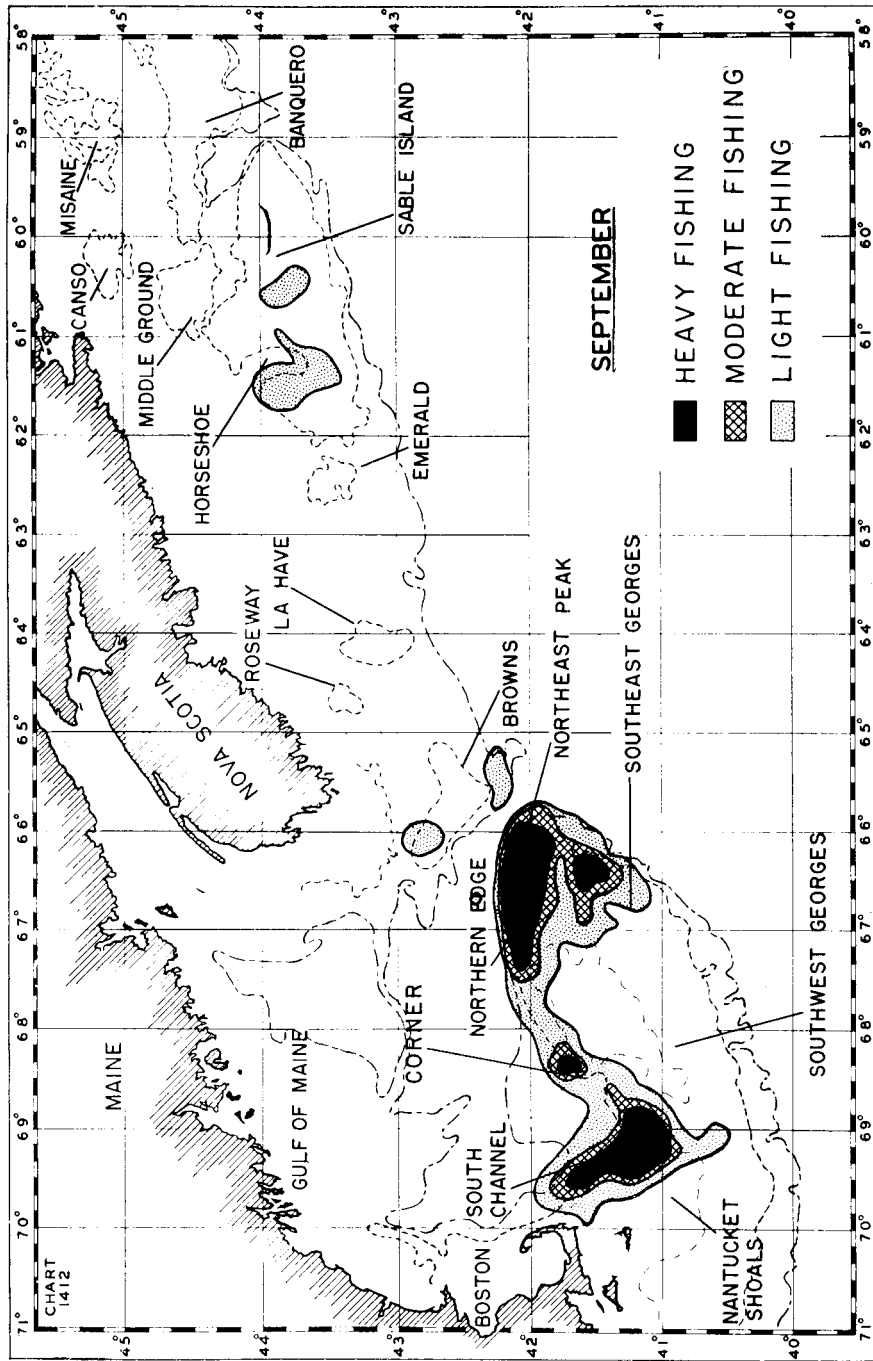


Figure 11.—Areas fished for haddock by Boston otter trawlers, 1938-49: September.

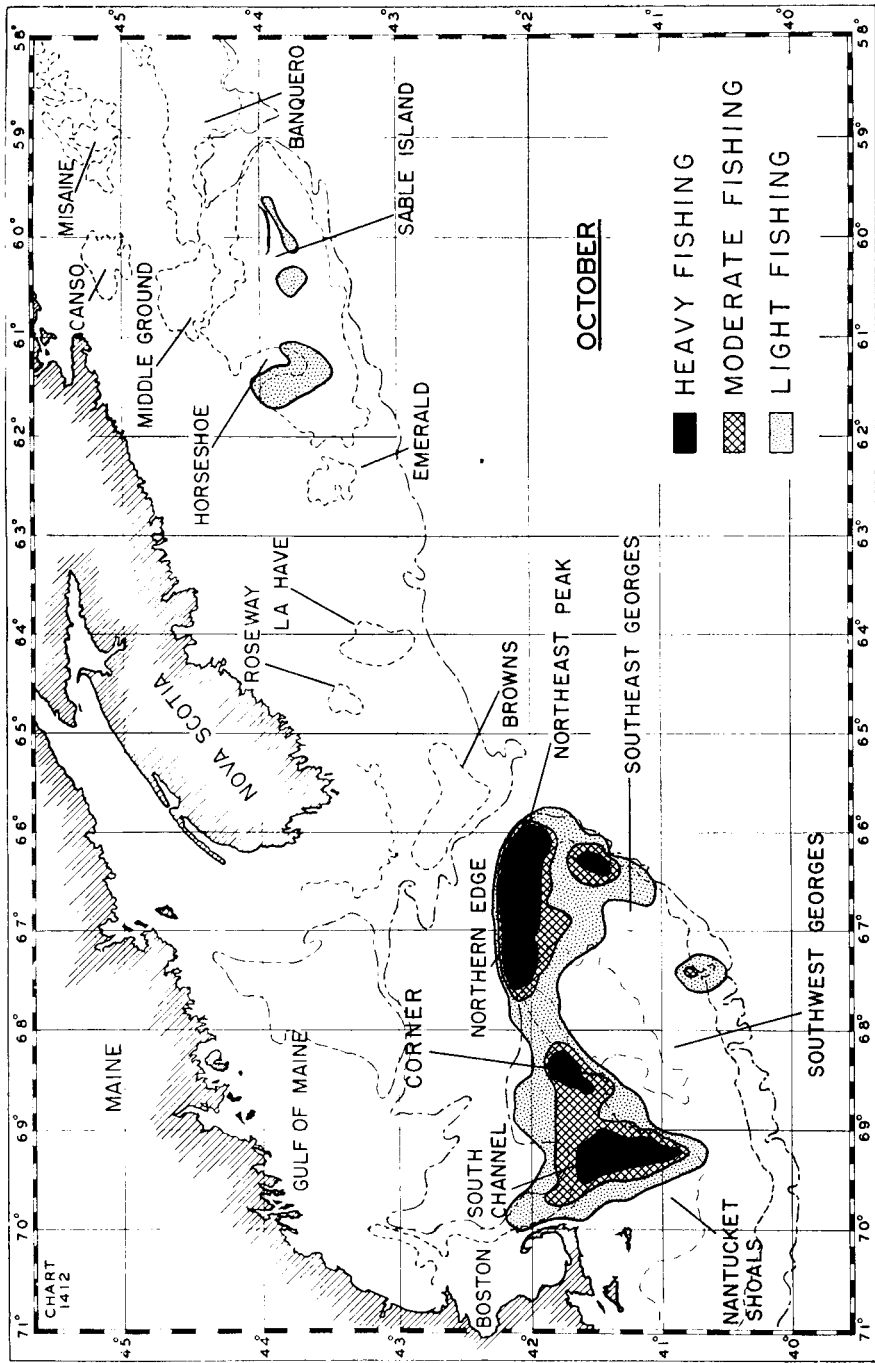


Figure 12.—Areas fished for haddock by Boston otter trawlers, 1938–49: October.

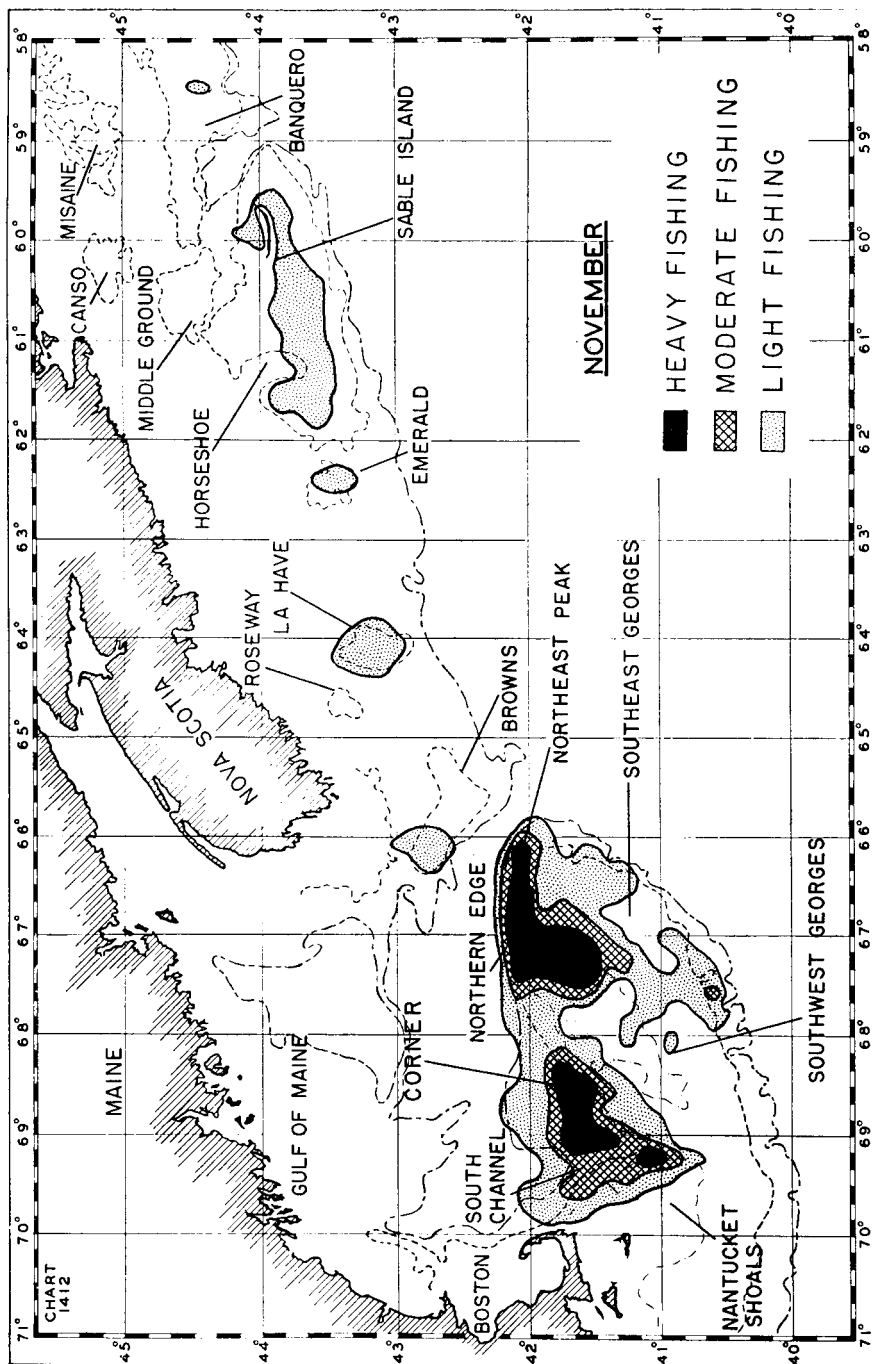


Figure 13.—Areas fished for haddock by Boston otter trawlers, 1938–49: November.

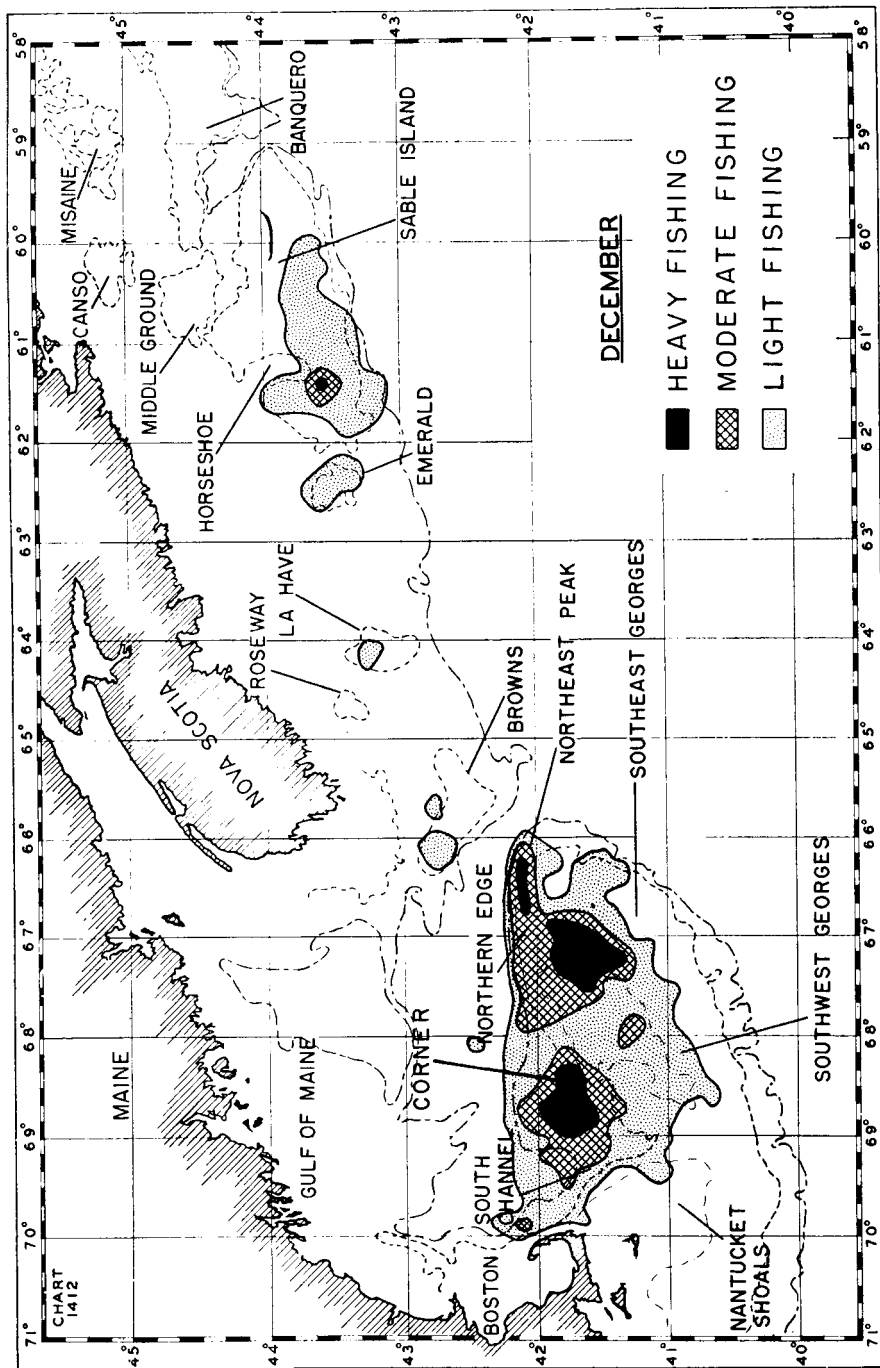


Figure 14.—Areas fished for haddock by Boston otter trawlers, 1938—49: December.

In discussing further the seasonal trends, four general areas which are obviously important and which are more or less separate will be considered individually. These areas are (1) Northern Edge, Northeast Peak, Southeast Georges, and Southwest Georges, (2) South Channel, (3) Browns Bank, and (4) the central and eastern Nova Scotian banks.

Northern Edge, Northeast Peak, Southeast Georges, and Southwest Georges.—In January there are scattered small concentrations of fishing, one on Northeast Peak, several on Southeast Georges and Southwest Georges. In February the concentration on Northeast Peak is enlarged and there is only one large concentration on Southeast Georges. In March and April this latter concentration has moved northward and is joined with the Northeast Peak concentration. In May the fishing is more to the westward and in two separate concentrations, one along Northern Edge and one on the shoal water of Southeast Georges. In June, for the first time the heavy concentration has left Northeast Peak, and the Northern Edge and Southeast Georges concentrations are joined along the 67° line. In July the concentrations are similar except that heavy fishing has moved out to Northeast Peak again. In August, September, and October, concentrations are virtually the same as in July, with heavy fishing along Northern Edge and a small area on Southeast Georges. In November the concentration on Southeast Georges has disappeared,

and the Northern Edge concentration has extended down into shoal water of Southeast Georges, mostly west of the 67° line. In December this one large concentration has divided into two parts, one along Northern Edge and one in the shoal water of Southeast Georges along the 67° line. By January the Northern Edge concentration has moved to Northeast Peak, and the Southeast Georges concentration has split into three separate heavy concentrations, one to the south, one to the east, and one to the southwest.

South Channel.—In January there is an area of heavy fishing in deep water that extends from the area known to the fishermen as the Corner, out into South Channel. In February, March, and April, generally similar concentrations occur, but in April only a very small area of heavy fishing is evident. In May and June there is a tremendous increase in the area of heavy fishing, and this large area is almost entirely in shoaler water. In July this large concentration is divided into two parts, one concentration on the Corner, the other extending along the eastern side of South Channel into the bottom of the Channel and along the eastern Nantucket Shoals. In August and September there is a similar concentration on the Corner, but the South Channel concentration has moved progressively to the west, more onto Nantucket Shoals, and north up onto the "Sankaty" or western side of South Channel. This channel concentration has withdrawn to the

south again in October, has diminished greatly in November, and finally has disappeared in December and January—as the Corner concentration has expanded greatly from the small area of concentration it maintained all summer.

Browns Bank.—Only during the months of February through May are there even small areas of heavy concentrations on Browns Bank. During the rest of the year, fishing by Boston trawlers is moderate, light, or negligible.

Central and eastern Nova Scotian banks.—In only 2 months are there heavy concentrations on these distant banks, in March just east of Emerald Bank and in December just southwest of Horseshoe Ground. In addition there are moderate concentrations southwest

of Horseshoe in December and January and again from May to August.

Another moderate concentration appears on Emerald Bank during January, spreads out and becomes lighter during February, reaches a minor peak in March, and then moves more to the eastward in April.

If the total range fished is divided into the two large areas of Georges Bank and the Nova Scotian banks, it can be seen from table 1 and figure 15 that in every month of the year the bulk of the fishing² was on Georges Bank.

² All data in this report refer to days fished. If instead of days fished, quantity of fish caught were considered, then the Nova Scotian banks would be relatively more important than they appear here. These banks are farther from port and must therefore furnish a higher catch per day to justify being fished.

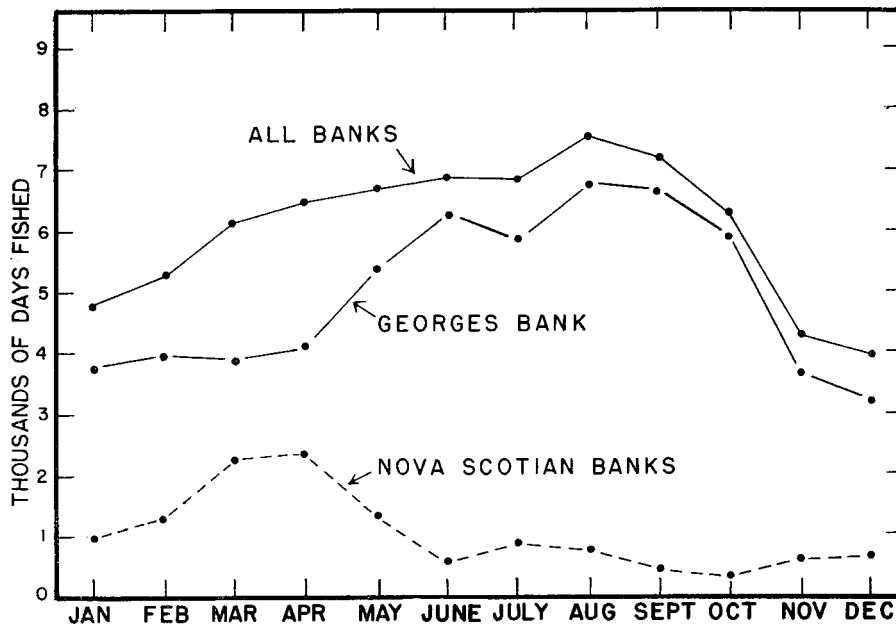


Figure 15.—Vessel-days of fishing in each month over the 12-year period.

Table 1.—Vessel-days of fishing over the 12-year period, by months

Month	Georges Bank	Nova Scotian banks	Total
January.....	3,791	1,010	4,801
February.....	3,984	1,331	5,315
March.....	3,926	2,206	6,132
April.....	4,116	2,366	6,482
May.....	5,353	1,358	6,711
June.....	6,300	612	6,912
July.....	5,905	939	6,844
August.....	6,794	815	7,609
September.....	6,714	502	7,216
October.....	5,944	367	6,311
November.....	3,712	595	4,307
December.....	3,250	730	3,980
All months.....	59,789	12,831	72,620

The accent on Georges Bank was not the same in all months, however, there being a definite trend in its relative importance from month to month. This can be seen from table 2, which shows what percentage of each month's fishing effort was spent in each of the two areas. Georges Bank was relatively most important in October when 94.2 percent of all fishing was done there. After October it was fished relatively less and less until April when it received only 63.5 percent of the total fishing effort. From April to the end of the year, at least 80 percent of the fishing effort in each month was spent on Georges Bank.

The patterns of fishing shown in this report were not absolutely maintained in all years of course, there being deviations from them in individual years. They do represent conditions over the whole 12-year period, or conditions in the average year. It is the purpose of this report to show only what grounds were important over the whole period and to show how the

Table 2.—Percentages of vessel-days of fishing on Georges Bank and on the Nova Scotian banks in the 12-year period, by months

Month	Georges Bank	Nova Scotian banks
January.....	79.0	21.0
February.....	75.0	25.0
March.....	64.0	36.0
April.....	63.5	36.5
May.....	80.0	20.0
June.....	91.1	8.9
July.....	86.3	13.7
August.....	89.3	10.7
September.....	93.0	7.0
October.....	94.2	5.8
November.....	86.2	13.8
December.....	81.7	18.3
All months.....	82.0	18.0

grounds varied in importance from season to season throughout the year.

SUMMARY

1. The offshore fishing grounds, among the most productive in the world, which support the United States haddock fishery are located precisely on charts in this report.

2. The records summarized are of the complete fishing effort of the whole fleet of offshore otter trawlers that fished over a 12-year period out of Boston, Mass., the major United States haddock port, and represent over 72,000 vessel-days of actual fishing.

3. One chart shows the location of the areas fished and the relative intensity of fishing for the whole 12-year period. The most heavily fished areas were (1) along Northern Edge extending to Northeast Peak on Georges Bank, (2) one area of Southeast Georges, (3) the Corner, between South Channel and Georges Bank proper, and (4) one small area on eastern Nantucket Shoals.

4. In general, the Georges Bank grounds were by far the most important to the United States fishery, receiving 82 percent of all the vessel-days of fishing, as compared with 18 percent for the group of Nova Scotian banks.

5. Twelve other charts give the seasonal pattern of the haddock fishing—one chart for each month of the year. These monthly charts show that, in contrast to the areas that were fished heavily over the year as a whole, there were other areas that were fished heavily in particular months only. Among

such areas were large portions of South Channel and some of Southwest Georges on Georges Bank; and Browns Bank, Emerald Bank, and Horseshoe Ground of the Nova Scotian banks.

6. In every month of the year most of the fishing was in the Georges Bank area, but the accent on Georges Bank was different in the various months. Georges Bank had 94.2 percent of the fishing in October, as compared with only 63.5 percent in April; its percentage varied between these extremes in the other months.

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