The Herring
(Clupea harengus harengus)
Gillnet Fishery in the Southern Gulf of St. Lawrence, 1970 – 1979

R.N. O'Boyle and L. Cleary

Marine Fish Division
Bedford Institute of Oceanography
Department of Fisheries and Oceans
Dartmouth, Nova Scotia
B2Y 4A2

September 1981

Canadian Technical Report of Fisheries and Aquatic Sciences No. 1065

Government of Canada
Fisheries and Oceans

Gouvernement du Canada
Pêches et Océans

Canadian Technical Report of Fisheries and Aquatic Sciences

These reports contain scientific and technical information that represents an important contribution to existing knowledge but which for some reason may not be appropriate for primary scientific (i.e. *Journal*) publication. Technical Reports are directed primarily towards a worldwide audience and have an international distribution. No restriction is placed on subject matter and the series reflects the broad interests and policies of the Department of Fisheries and Oceans, namely, fisheries management, technology and development, ocean sciences, and aquatic environments relevant to Canada.

Technical Reports may be cited as full publications. The correct citation appears above the abstract of each report. Each report will be abstracted in *Aquatic Sciences and Fisheries Abstracts* and will be indexed annually in the Department's index to scientific and technical publications.

Numbers 1-456 in this series were issued as Technical Reports of the Fisheries Research Board of Canada. Numbers 457-714 were issued as Department of the Environment, Fisheries and Marine Service, Research and Development Directorate Technical Reports. Numbers 715-924 were issued as Department of Fisheries and the Environment, Fisheries and Marine Service Technical Reports. The current series name was changed with report number 925.

Details on the availability of Technical Reports in hard copy may be obtained from the issuing establishment indicated on the front cover.

Rapport technique canadien des sciences halieutiques et aquatiques

Ces rapports contiennent des renseignements scientifiques et techniques qui constituent une contribution importante aux connaissances actuelles mais qui, pour une raison ou pour une autre, ne semblent pas appropriés pour la publication dans un journal scientifique. Il n'y a aucune restriction quant au sujet, de fait, la série reflète la vaste gamme des intérêts et des politiques du Ministère des Pêches et des Océans, notamment gestion des pêches, techniques et développement, sciences océaniques et environnements aquatiques, au Canada.

Les Rapports techniques peuvent être considérés comme des publications complètes. Le titre exact paraîtra au haut du résumé de chaque rapport, qui sera publié dans la revue *Aquatic Sciences and Fisheries Abstracts* et qui figurera dans l'index annuel des publications scientifiques et techniques du Ministère.

Les numéros 1-456 de cette série ont été publiés à titre de Rapports techniques de l'Office des recherches sur les pêcheries du Canada. Les numéros 457-714, à titre de Rapports techniques de la Direction générale de la recherche et du développement, Service des pêches et de la mer, ministère de l'Environnement. Les numéros 715-924 ont été publiés à titre de Rapports techniques du Service des pêches et de la mer, Ministère des Pêches et de l'Environnement. Le nom de la série a été modifié à partir du numéro 925.

La page couverture porte le nom de l'établissement auteur où l'on peut se procurer les rapports sous couverture cartonnée.

Canadian Technical Report of

Fisheries and Aquatic Sciences
1065

September 1981

THE HERRING (*Clupea harengus harengus*) GILLNET FISHERY IN THE SOUTHERN GULF OF ST. LAWRENCE, 1970-79

by

R. O'Boyle and L. Cleary[1]

Marine Fish Division

Bedford Institute of Oceanography

Dartmouth, Nova Scotia B2Y 4A2

---

[1] Division des sciences halieutiques,
Service des pêches de l'Atlantique,
Région du Golfe
Gare Maritime Champlain
Ministère des Pêches et Océans
Québec, Québec
G1K 7Y7

Minister of Supply and Services Canada 1981
Cat. No. Fs 97-6/1065E ISSN 0706-6457

Correct citation for this publication:

O'Boyle, R., and L. Cleary. 1981. The herring (Clupea harangus harangus) gillnet fishery in the southern Gulf of St. Lawrence, 1970-79. Can. Tech. Rep. Fish. Aquat. Sci. 1065: 90p.

CONTENTS

ABSTRACT

The herring gillnet fishery in the southern Gulf of St. Lawrence has represented an important component of the region's economy since the turn of the century. To date, no in-depth studies into its activities have been undertaken. The present study investigated the fishery during 1971-79 - its temporal and spatial aspects, the characteristics of the gear used and its operation, as well as biological parameters of the herring populations, including distribution of spawning adults and juveniles. The data were collected by both interviews and mailed questionnaires, which afforded an opportunity to compare the two procedures in the gathering of information suitable for stock management.

The results indicated that, although the length of the fishing season has remained relatively constant since 1971, the number of nets deployed by each fisherman has dramatically increased over the same period. These increases, combined with an augmentation in the number of fishermen participating in the fishery, have led to large increases in the effective effort experienced by the stock.

RÉSUMÉ

La pêche au hareng par les filets maillants constitue une ressource économique importante pour la région du sud du golfe Saint-Laurent, et ce, depuis le début du siècle. Jusqu'à maintenant, aucune étude détaillée de cette pêche n'avait été entreprise. Les travaux présentés dans ce document concernent donc cette pêche au filet, pour la période 1971-79. Les tendances temporelles et spaciales de la pêche, les caractéristiques des engins de pêche et des modes d'opération en vigueur, ainsi que des paramètres biologiques des populations de hareng (ie distribution des adultes en frai et des juvéniles) sont examinés. Toutes les données ont été recueillies au cours d'entrevues avec des pêcheurs, ou par l'entremise de questionnaires écrits; l'utilisation de ces deux méthodes d'inventaire nous a permis de comparer leur efficacité relative dans la collecte d'information pour la gestion des stocks.

Les résultats démontrent que, même si la durée de la saison de pêche est demeurée relativement constante de 1971-1979, le nombre de filets utilisés par chacun des pêcheurs a augmenté en flèche au cours de cette même période. Cet accroissement du nombre de filets, combiné à contribué à l'augmentation de l'effectif des pêcheurs au filet, a contributé à augmenter largement l'effort de pêche exercé sur le stock de hareng.

INTRODUCTION

The herring fishery in the southern Gulf of St. Lawrence has long been an important part of the region's economy. Prior to 1965, virtually all landings were reported by small vessels operating inshore within 10 miles of their home port. Gillnets and traps were the main gears in use. During 1940-56, landings ranged between 28-43,000 mt annually with catches averaging 35,000 mt (Tibbo et al. 1969).

Catches declined during the late 1950's on account of reduced stock levels caused by widespread fungal infection. Good recruitment in 1958 and 1959 caused a slight increase in catch levels in the early 1960's, with inshore gear landings peaking at 44,000 mt in 1965.

In 1966, a large mobile fleet, composed mainly of purse seiners, developed after the discovery of major concentrations of overwintering fish off southwest Newfoundland. Catches of this fleet peaked at 278,000 mt in 1970 and subsequently dropped sharply to 36,000 mt by 1973.

Inshore landings have steadily decreased since 1965 and now (1980) make up about 13,000 mt of the 41,000 mt reported being landed.

A total allowable catch (TAC) of 55,000 mt was first applied to this fishery in 1975 in an effort to control the exploitation rate. This TAC remained virtually the same for the 1975-80 period. In 1980, there were signs that the stock was undergoing a dramatic decrease in abundance. These were confirmed in 1981. Indeed, the stock appeared to have been declining since 1977. These abundance changes were difficult to observe due to the problems encountered in interpreting the data available. Biologists attempting to access the stock status relied on purse seine log book information and, more recently, incidental catch rates of herring observed on groundfish research surveys, to provide estimates of stock abundance. Both sets of data can provide a biased view of trends in stock abundance (Paloheimo and Dickie, 1963). Thus, it has become increasingly important, with declining stock levels, to develop an index of abundance that does not suffer the biases present in the other indices. It was felt that an examination of the catch rate trends in the inshore fishery would be helpful in this regard.

Before quantifying the activities of the inshore fishery, basic background information is required to guide the analysis. Three studies (Ware and Henriksen, 1978; Spénard, 1979 and Greendale and Powles, 1980) have recently been carried out with this aim in mind. The first examines the herring spawning stock structure while the latter two examine aspects of the Madeleine Island and Gaspé fisheries respectively. However, none of these studies give an in-depth view of the inshore herring fisheries based in the Gulf shores of Nova Scotia, New Brunswick and Prince Edward Island.

This document presents the results of a survey of the maritime based southern Gulf inshore herring fisheries which was conducted during the summers of 1978 and 1979. The survey was composed of dockside interviews with fishermen, to gain descriptive information on the fishery, and a mailed questionnaire from which information on trends in effort for the 1970-79 period was obtained. The dual nature of the survey also allowed evaluation of the relative merits of the two techniques in future data gathering exercises.

It is hoped that the background knowledge of the fishery presented in this document will prove worthwhile as a useful adjunct to on-going and future studies.

HISTORICAL TRENDS IN THE REPORTED LANDINGS OF THE GILLNET FISHERY

Before describing the survey and its results, it might be worthwhile to first examine the trends in the catch statistics observed for the 1967-79 period.

The overall trends in the catches, by fishery component, are illustrated in Figure 1. Since entrance of the purse seine fleet into the fishery in the mid-1960's, the inshore gear catches have steadily declined. Present annual inshore gear catches of 10-15,000 mt are much lower than the historical average of 35,000 mt. To determine if these declines were observed throughout the southern Gulf or just in particular locations, the landing statistics as presented in Tables 1a - 1m were first grouped by area and season of fishing activity and then plotted over time. The area groupings were based on known locations of herring processing facilities. The first area to be considered was that surrounding the extensive processing facilities located in the Shippegan area. All landings from statistical districts 63-71 (Figure 2) were combined for this area. The second grouping consisted of landings reported in statistical districts 73-80, 82-83 and 92-93. Most of the processing of these landings occurs in Escuminac. The third grouping comprised the landings from statistical districts 85-88 and 94-96 while the last grouping to be considered was for statistical districts 2-45. Both the last two areas are of relatively minor importance to the overall fishery but are considered here for completeness.

The grouped landings are given in Table 2 and illustrated in Figure 3. It can be seen that, overall, the spring fishery (January-June) has reported over 50% of the catch in each year. There are exceptions to this in some years - in particular 1971-1972. Over the time series presented, it appears that herring landings in the spring dramatically dropped during 1968-72 period while in the fall (July-December) equivalent declines were observed later - during 1971-74. This may account for the apparent high landings reported in the fall fishery relative to the spring fishery during 1971-72.

Most of the spring fishery activity is concentrated in area two and also area one. It might be noted, however, that landings in the Shippegan area have decreased more extensively than those in the Escuminac area for the period in question.

Most of the fishing activity in the fall occurs in area one. However, since 1973, the relative contribution to the total catch from all other areas combined has become increasingly higher. Indeed, virtually all the declines in the fall fishery were restricted to the Shippegan area.

SURVEY METHODOLOGY

The survey was conducted in the southern Gulf of St. Lawrence (Figure 2) during May-September, 1978-79. A preliminary set of interviews was carried out in Pictou county (statistical district 12) to aid in determining the formulation of the questions posed to the fishermen. Following this, on-sight interviews with herring gillnet fishermen were conducted in order to obtain general descriptive information on the fishery. Next, a short list of questions pertaining to quantitative aspects of the fishery was mailed to all herring gillnet fishermen licenced during 1979.

INTERVIEW SURVEY

In New Brunswick and Prince Edward Island, the fishermen were interviewed during the summer of 1978, and in Nova Scotia, during the summer of 1979. People were selected for interviews in a variety of ways: some were contacted through referrals from fisheries officiers, processors or other fishermen, while others were approached directly either on the wharf or at the fish plants.

Each interview was carried out according to the questions outlined in Appendix A. The questions were formulated to provide information on:

1) Name and place of residence of fishermen.

2) Fishing gear characteristics such as gear type and size, and any changes that may have occurred since 1970.

3) Utilization of fishing gear such as factors affecting gear deployment, learning, changes in fishing activity over time (yearly and seasonally) etc.

4) Characteristics of the herring population such as size and distribution of juveniles, adults and spawners, as well as associated catch species.

The results for the interviews carried out in N.B. and P.E.I. during 1978 were destroyed in a fire at the Bedford Institute that occurred in April 1979. Only summary tables survived. Consequently, in the tables presented below which summarizes the interview results only mean values are given for these areas, as standard deviations and/or ranges could not be calculated.

MAIL SURVEY

The mail survey was conducted during the summer of 1979 only.

A list of the names and addresses of all herring gillnet fishermen licenced in 1979, was obtained from the licensing division of the Federal Department of Fisheries and Oceans based in Halifax, Nova Scotia. Each fisherman on the list was sent a questionnaire, (both French and English versions in New Brunswick) and a pre-stamped self-addressed envelope. The subject was requested to return the envelope only if he did not fish for herring. Otherwise he was asked to answer questions concerning his:

1) name and residence area;

2) sale of the catch and fishing experience; and,

3) fishing activity including the fishing season start and end dates, number of nets deployed per day etc. It should be noticed that this part of the questionnaire was similar to items 8 and 9 of the interview survey (Appendix A).

Examples of the English and French version of the questionnaire are given in Appendices B and C. The two versions differ sightly in that the French version included a question on the species associated with herring catch, while the English version asked for a definition of the word "set".

RESULTS AND DISCUSSION

SURVEY COVERAGE

Interview Survey

A total of 174 fishermen were interviewed in the survey area. This represents about 5% of all inshore fishermen licenced to catch herring in 1979 (Table 3). The best coverage was obtained in Nova Scotia where up to 10% of the population was sampled. Indeed, in statistical district 46, where 6 fishermen were reported to have licences, the sampling coverage was 50% of the population. The only area in which a proportionately large sample size was obtained was in district 85 on Prince Edward Island. The overall sampling coverage of Prince Edward Island and New Brunswick was around 4-5%. This is due in large part to the high numbers of licenced fishermen in these two provinces. An additional problem was encountered in New Brunswick. There, many of the fishermen are francophone. Thus a large number of the interviews had to be conducted through an interpretor. This caused a reduction in the number of interviews that could be conducted in a day and thus because of time constraints a reduction in the total number of interviews for that area.

Mail Survey

Table 4 presents a district by district breakdown of the number of questionnaires sent out and how many were returned. Overall, a total of 888 questionnaires (27%) were returned with the majority of these (701) stating some active involvement in the herring fishery. It might be noted here that ownership of a herring gillnet licence does not necessarily guarantee involvement in the fishery. Thus some returns from fishermen reporting that they do not fish for herring were expected.

Returns from N.S., N.B. and P.E.I. were 19.0, 32.6, and 18.8 percent respectively. As mentioned earlier, a separate English and French version of the questionnaire was mailed out to all fishermen. Due to administrative problems, both versions were not sent out simultaneously. Thus, the area was in effect covered twice. In anglophone areas, the French version would probably have been ignored. However, in New Brunswick, where many of the fishermen are bilingual, some probably answered in English while some answered in French. As names were normally given, these were checked against a master list to ensure that no fisherman answered twice. This "double" sampling may account for the relatively high rate of return from the New Brunswick area.

The highest returns were obtained from around Miramichi Bay while the lowest were obtained from districts 10 and 11 of N.S. and district 82 of P.E.I. To see if the percent returns bore any relation to the trends in reported landings throughout the area, a correlation between the percent response per district and the 1979 gill landing per district was calculated. The correlation coefficient was 0.44 with a slope not significantly different from zero. Thus response to the questionnaire did not seem at first analysis to be dependent on the amount of economic involvement in the fishery.

CHARACTERISTICS OF THE FISHERY

Spatial and Temporal Distribution

From the results of the mail survey, it was evident that throughout the survey area, fishing activity was most intense during the second quarter of the year (Table 5). Activity in the third and fourth quarters was restricted primarily to statistical districts 65-67 and 73 in New Brunswick.

More detailed times for seasonal fishing activity were available from compilation of the geometric means for start and end dates of both the fishing season and the period of peak fishing activity, i.e. when fishing effort was most intense as provided by the 1979 mail survey responses. These data are illustrated in Figure 4. Only findings based on the 1979 data are presented here as no obvious trends in the timing of seasonal fishing activity were evident over the 1971-79 period. It is thus felt that events occurring in 1979 are typical of those present in the fishery during that period.

In New Brunswick, Nova Scotia and most areas of P.E.I., most fishing starts around the end of April. What really determines the exact date is the timing of the ice breakup. This appears to be the reason why northern districts in P.E.I. can commence their spring fishing activity earlier than is observed in other areas. It was also in this area that the highest catch rates were observed earliest. By mid-May, the height of the spring fishing activity has been reached in most districts. High catch rates do not occur in districts 11, 13, 45 and 46 until mid-June. Similar results were also obtained from the interview data, which is summarized in Table 6 and Figure 5.

By late May to early June, the time of maximum spring fishing activity is over in most areas. However fishing in most parts of Nova Scotia remains high until early-mid July.

Fall fishing is not quite as widespread as fishing in the spring. There is no fall fishery in those districts of New Brunswick and P.E.I. bordering the Northumberland Strait. The most extensive fall fishing occurs in Northern areas of New Brunswick, particularly in districts 64-68. Some fall fishing also appears to be present in most northern areas of P.E.I., but is restricted to districts 11, 12 and 13 in Nova Scotia. The fall fishing season ends sometime in October in most areas. As with the spring fishery, the overall trends in the fall fishery, as determined by the mail survey, agree with the patterns obtained during the interviews (Table 7 and Figure 6).

As will be seen later, one of the most important determinants of timing of the fishing season is the spawning time of the herring. However, these is also an interaction with the lobster fishing in the spring and the mackerel fishery in the fall that confounds this view. The following comments on the spring and fall fisheries were obtained from the interviews and contain interesting insight into the nature of these fisheries.

The spring fishery: The locations of the major fishing grounds used during the spring and fall are given in Table 8. Local fishing activity occurs in virtually all districts visited. This fishing is generally conducted close inshore, often no more than ten miles from their home port.

There are also present three fishing grounds which are frequented by fishermen who travel long distance to fish there. The most important of these is off Escuminac (Figure 7). Fishermen from almost all ports of southern New Brunswick, and four districts of P.E.I. (82, 83, 87 and 92) go to this area to fish in the spring. Apparently there can be as many as 200-300 boats

in the area at one time. Some of these boats set upwards of 100 nets. The second most important fishing ground is on the Quebec side of Chaleur Bay. New Brunswick fishermen from districts 64-65 go here to fish. The third reported fishing area is off Borden, P.E.I. Fishermen from both sides of Northumberland Strait travel to this area to fish. This fishery is relatively minor compared to the other two.

During the interview, fishermen stated that these migrations have become increasingly important to the fishery on account of the unpredictable nature of herring distributions and declining catch rates.

It might be worthwhile to mention at this point that the majority of fish caught by these mobile fishermen are landed in the statistical districts bordering the fishing area. There are, however, two exceptions to this. New Brunswick fishermen operating on the Quebec side of Chaleur Bay will normally land their catch on the New Brunswick side of the Bay. Also, there were scattered reports of P.E.I. fishermen active in the Escuminac area landing their catch in P.E.I. This, however, appears to be rare.

As was stated above, fishing locally for herring in the spring occurs over much of the southern Gulf. Much of this activity appears to be directed at providing bait for the lobster fishery. Figure 8 illustrates the districts identified in the interviews as being bait fishing areas. The only major part of the southern Gulf not involved in fishing for herring as lobster bait is that bordering the western end of the Northumberland Strait. This is the area where fishermen were found to be most active in the Escuminac herring fishery. As well, the lobster season in this area is from 10 August to 10 October whereas in all other areas it is from 1 May to 30 June.

From the interviews, it became apparent that some of the large boats, when not fishing for herring, go fishing for lobster or mackerel. As the lobster season in the western Northumberland Strait area does not occur until the fall and the herring appear congregated off Escuminac, it appears that the fishermen in the western Northumberland Strait area go fishing for herring in the Escuminac area due to the prohibition to fish lobster in their own area.

The fall fishery: As is observed in the spring, there are both relatively fixed and mobile components to the fall fishery. In general, the fall fishery is not as extensive as the one occurring in the spring. In many areas, herring fishing was not reported to occur (Table 8). There are, however, three major locations to which fishermen go to fish herring. The most important of these is on the Quebec side of Chaleur Bay and around Miscou. Fishermen from all over northern New Brunswick go to this area to fish (Figure 9). The next most important area is off Escuminac. This involves local fishermen as well as fishermen from both northern (statistical districts 65-67) and southern (statistical districts 77-78) New Brunswick. The last reported fishing area is off Richibucto which involves fishermen from the Miramichi Bay area.

It appears that, excepting the comments given above, mackerel fishing replaces herring fishing for most Gulf fishermen in the fall. This is particularly true for those southern New Brunswick fishermen who during the spring fished herring in the Escuminac area. The major locations of the mackerel fishing are given in Figure 10. It must be mentioned that fairly large amounts of herring are landed as a by-catch to this fishery.

Nature of the Fishermen

In the mail survey, three questions were asked to determine the respondee's status in the fishery. These queried him on the amount of time he employed fishing for herring, the number of years of herring fishing experience that he had and and the ultimate use of his catch.

Percentage of time spent herring fishing: In Nova Scotia and Prince Edward Island, most respondées stated that they spend approximately 25 percent or less of their total time fishing going after herring (Table 9). Nova Scotia exhibited the least active herring fishermen from this point of view. New Brunswick fishermen on the other hand appeared to be most active in the fishery. Interesting enough, the responses appeared to fall into two groups - those from outer Chaleur Bay (65-67) and those from the southern shore of Miramichi Bay (73-75). As seen earlier, these are precisely the two areas where much of the spring and fall fisheries occur. Certainly the offshore fishermen are very active in these areas. Some of the respondents from these areas stated that they spend 100% of their fishing time going after herring. The only other districts where this occurred were in P.E.I. (83 and 92) which, as seen earlier are areas containing many fishermen that participate in the spring Escuminac Fishery.

Table 10 summarizes the number of fishermen who stated being active in the spring, fall or both seasons. The percentage of fishermen reporting that they fished year-round was high in many areas, especially in statistical districts 65-67. The predominant number of fishermen who answered the questionnaire fished during the spring. The number of fishermen who fish solely in the fall was quite low.

Years of experience. To obtain some estimate on how skilled a particular fishermen was in catching herring, each fisherman was asked to state how many years he had been involved in the herring fishery. These results are shown in Table 11. In a few cases, the number of years of experience was greater than 50. Most individuals however had anywhere from 1 to 30 years participation in the fishery. As can

be seen from the table, no one area appeared to have a monopoly on experienced herring fishermen. There was a slight tendency towards the presence of more experienced fishermen in the Shippegan - Miscou area but this may not be significant.

A closer examination of the data revealed that, in all three provinces, the fishermen's experience frequency distribution was biomodal, with the modes occurring at 1-5 years and 11-20 years in both N.S. and N.B. The second mode in P.E.I. was quite flat, covering a time span of 11-30 years. This tends to indicate that a large number of serious fishermen entered the fishery some 11-20 years ago. Why this occurred is unknown but may have had something to do with expansion of offshore fishing operations in the Gulf during the mid-late sixties. This no doubt led to the spread of processing plants which may have encouraged participation in the fishery. This speculation cannot be carried further without firm data which is presently lacking.

Use of catch by season: The fishermen were asked to state whether they sell their catch to processors, to individuals or keep it for personal use. The results of this question were separated according to fishing season and district (Table 12). All fishermen who stated that they fished for herring before 1 July were considered active in the spring fishery. All those who stated that they fished for herring on or after 1 July, were considered active in the fall fishery. All others were classified as having fished in both seasons. Only those responses which reported one use of the catch were considered.

Sale to processors is restricted to districts 65-68, 73-83 and 92 during the spring and is prevalent in all areas during which fishing takes place in the fall. It is interesting to note that a large proportion of the fishermen who fish in both seasons sell their catch to the processors.

Sale to individuals is prevalent throughout the survey area, particularly in Nova Scotia and from Restigouche to the Miramichi in New Brunswick during the spring lobster season.

As well, most districts of P.E.I. report some sale to individuals in the spring. Very little fishing activity occurs in P.E.I. during the fall.

Gear Deployment and Use

Information on the gear characteristics and how the nets are deployed was obtained during the interviews. Data on the number of nets deployed per day and the total number of days spent herring fishing were obtained from the mail surveys. These results are summarized in the following sections.

Fishing operations: In general, there are two types of fishermen who fish for herring with gillnets - those who operate close inshore and those who fish further offshore.

Inshore fishing is carried out year round while offshore fishing is generally restricted to the fall season, at which time the herring tend to congregate in deeper waters.

The inshore fishermen generally have small boats and use up to four nets in one cast. This limit is due to the fact that all hauling of the nets is carried out by hand. Normally when catch rates are high, few nets are used to facilitate retrieval of the nets.

Inshore fishermen can set their nets in one of three ways. The string of nets can be 'set' or anchored at both ends. This is the most common method of fishing. A variant of this is to anchor the net at one end only and allow the string to pivot with the tide. However, this is relatively uncommon. Nets anchored by either of the two above procedures are normally checked once a day. However, when the weather is bad or herring abundance low, the nets are checked less frequently, perhaps once every two days. In most areas, this daily routine of lifting and checking the nets is enough to keep them clean. Along the Northumberland Strait side of P.E.I. however, the high silt levels require a regular schedule of net retrieval and cleaning to allow effective fishing.

The third method employed by these inshore fishermen is drift netting. The string of nets is simply placed in the water and allowed to drift with the current. In most areas, the boat is tied to the drifting net, which allows the fisherman to check his net at regular intervals - normally every 24 hours. This type of fishing is particularly popular in the fall mackerel fishery. As the mesh sizes used are relatively large (2¾"-3"), only large herring are caught as a by-catch to this fishery.

The offshore fishermen tend to use larger boats than the inshore fishermen. These boats are equipped with hydraulic rollers to facilitate net recovery and sonar gear to locate herring schools. The rollers allow these boats to set and retrieve more nets than is possible for the smaller inshore vessels. Strings of 4-25 nets are not uncommon for casts made by these boats. As well, the nets tend to be deeper than those employed by the inshore boats.

Offshore fishing relies on searching with the sonar equipment. Since the fish seem to be congregated at night and thus easily detected on the sonar, this type of fishing normally occurs during that period.

Communication between fishermen plays a large role in fishing success. Sometimes, however, this can cause high densitites of boats in a confined area and consequently a reduction in catch rates. This type of fishing has also

taken its toll on lobster gear which can be overrun at night. Once a school of herring has been located, the fishermen attempt to cast their nets ahead of it. Then they wait from one to a maximum of 24 hours until the nets are full before hauling back in. Normally drift netting, as discussed above, is used but in times of rough weather, set netting is more popular. This causes some confusion in the reporting on the purchase slips since it is difficult to distinguish in some cases whether a set or drift method of fishing was used.

Due to BIO fire damage, data on the relative number of fishermen employing set or drift procedures are only available for Nova Scotia (Table 13). In the three districts surveyed, 43 out of 46 fishermen stated that they used the set net procedure. It seems likely that, in most areas, drift netting, because of manouverability, is generally restricted to offshore fishing while set netting can occur both inshore and offshore.

Factors Influencing Fishing Success

Fishermen were asked during the interviews to indicate the importance of various criteria in choosing their fishing location. The results for Nova Scotia are summarized in Table 14. In general, a knowledge of the herring movement and communication between fishermen play an important role in determining the fishermen's success in the fishery. Wind is very important as strong on-shore winds can damage nets and prevent boats from going to sea. Some fishermen did state that tides are important in determining the way a net is set. For instance, in areas of strong tides, the nets must be set perpendicular to the flow of the tide or they will be lost. In Nova Scotia, offshore winds seemed to be particularly important in determining a fisherman's activity. Although there was a fair amount of variation from one area to the next, most fishermen interviewed stated that their individual criteria for ensuring fishing success have remained the same over the years.

Gear Characteristics

Due to BIO fire damage, data on the size of the boats used in the 4T herring fisheries are available for Nova Scotia only. In this area, the boats used measure, on average, 32 feet in length and weigh between 6-9 tons (Table 15). There appear to be no significant differences in length and weight for the boats from the six Nova Scotia statistical districts. It might be noted that these boats generally have storage capacities restricted to one day.

The mean length of gillnet used during both the spring and fall fisheries varied considerably in the survey area (Table 16 and Figure 11) over the period 1970-78. The longest nets were found in Cape Breton (statistical districts 2 & 3) while the shortest ones were found in the Northumberland Strait (stat. dist. 46 & 80). The mean length of nets in N.S., P.E.I. and N.B. was 169, 104 and 100 feet respectively. From Figure 11, it can be seen that most of the small nets in N.B. are concentrated north and south of the Miramichi River (stat. dist. 68-77). No significant changes in mean length of the nets was evident over the 10 year period.

Table 17 summarizes what data are available for the net depths used in the spring and fall fisheries. Since the original data are unavailable, the depth had to be expressed in meshes. Thus interpretation of the results will be confounded with changes in mesh size. Nevertheless, the average depth of nets used in the fall fishery (121 meshes) is almost double that for nets used in the spring (66 meshes). As stated earlier, this is due to the fact that fishing in the fall is generally carried out further offshore than fishing in the spring. No obvious trends with geographical location over the 10 year period were apparent.

Tables 18, 19, and 20 summarize the findings on distribution of mesh size in the survey area. During the spring fishery (Table 18), the largest mesh sizes (2 3/8 - 3 inches) are found predominantly in Nova Scotia, the Chaleur Bay area of N.B. and the eastern part of P.E.I. The most widespread mesh sizes used are 2½ in N.B. and P.E.I. and 2 5/8 in the northern parts of N.B. and N.S. The frequency of occurrence of the various mesh sizes observed in Nova Scotia is given in Table 20. It is interesting to note that in general, the mesh sizes used in N.B. tend to gradually decrease from Chaleur Bay down to the Northumberland Strait. As well, the mesh sizes on the Strait side of P.E.I. tend to be smaller than those on the Gulf side.

As shown in Table 19, the mesh sizes used in the fall gillnet fishery are larger than those observed in the spring fishery.

This may be due to the fact that vessels fishing in the fall also direct their effort onto mackerel, which requires nets with mesh sizes of 2 3/4" - 3".

Number of Nets Per Set

Most fishermen interviewed defined a set as the number of times they checked their nets for catch. In other words, each time they visit their nets, they call it a set. As stated above, nets are usually checked once a day. This definition of a set has been kept for all following discussions.

The mean number of nets per set used by fishermen during the spring and fall fishing seasons varied considerably throughout the survey area (Table 21). During the spring fishing season, New Brunswick fishermen used the most nets (24 per set). The majority of these nets concentrated in statistical districts 73-80 at the western end of the Northumberland Strait (Figure 12). P.E.I. fishermen used about 14 nets each on average. Again, the statistical districts at the western end of Northumberland

Strait (82-83) exhibited the highest concentration of nets. The average number of nets per set in Nova Scotia (4) was quite low in comparison, the highest numbers being present in the districts bordering Northumberland Strait. Unfortunately, no data were available for statistical district 12 (Pictou).

Net useage in the fall fishery was almost completely restricted to New Brunswick (Table 21 and Figure 13). Again, statistical districts 73-80 showed the highest numbers deployed per set. The area around Shippegan, Miscou Island and the Baie de Chaleur seemed to be as important in the fall fishery as was found to be the case in the spring fishery.

Number of Days Spent Fishing

From the previous discussion, it is evident that the spring and fall fisheries are dramatically different in their nature. As well, the fishermen which operate in these fisheries can be classified as those which sell their catch to processors and those which either sell their catch for bait or keep it for personal use. These categorizations were used in the following discussions to facilitate the analysis of the mail survey data.

The mean number of days spent herring fishing by season, district and type of fishermen, for the 1977-79 period is illustrated in Figure 14. As one can see, there is no discernable difference in the length of the fishing season experienced by the 'processor-directed' and 'bait-directed' fishermen.

The spring fishermen in general tends to have a shorter season than those who operate in the fall. There was, however, a tendency for the fall fishery persecuted in the Northumberland Strait to be shorter than that carried out elsewhere. To facilitate analysis of these spatial and temporal trends, the mail survey data were grouped by fishing region. This grouping was carried out on districts which from the interview and mail survey results were shown to exhibit similar characteristics. Thus, the fishery which is carried out in the northern New Brunswick area, hereafter referred to as the Chaleur Bay grouping, consists of data pooled for districts 63, 64, 65, 66, 67 and 68. The Escuminac region was taken as another grouping consisting of data from districts 70, 73, 75, 76, 77, 78, 80, 82, 83 and 92.

The pooled data by fishing region, year, season and fisherman type are presented in Table 22.

Since 1971, the spring Chaleur Bay fishing season has been longer than that off Escuminac. For fishermen who sell their catch to processors, the spring season has been getting shorter since 1971, much of this drop occurring in the Chaleur Bay area. There does not appear to have been much of a change in either the length of the fall fishing season for 'processor-directed' fishermen or the length of the fishing seasons for 'bait-directed' fishermen.

Number of Nets Deployed Per Day

Considerable differences by fisherman type, season, area and year were found in the number of nets deployed per day by type of herring fishermen. The results for all areas and fishing seasons for 1979 were plotted by fisherman type to discern the underlying distribution of the data. In general (Figure 15), the number of nets deployed per day by fishermen tended to be skewed to the left. However, this effect was not evident for those fishermen who used the catch for bait (personal use). In all subsequent analysis the data for bait fishermen were treated with geometric means. In all other cases, the arithmetic mean was used.

Figure 16 illustrates both seasonal and spatial patterns in the numbers of nets deployed per day by the two main types of herring fishermen for the 1977-79 period. These data are summarized for all years surveyed in Table 23.

As expected, fishermen who sell their catch to processors use considerably more nets than those who fish just for bait (personal use). For the 1971-79 period, the former group employed 18-30 nets per day while the latter group used 7-9 nets per day. Also, the number of nets deployed by bait fishermen has remained relatively unchanged since 1971, while the number of nets deployed by the 'processor-directed' fishermen has changed markedly over the same time period.

There are considerable difference found from one area to another. Fishermen in the Chaleur Bay area generally deploy 5-10 nets per day as opposed to the 26-38 nets per day used by Escuminac fishermen.

In almost all areas, there has been a tendency for the number of nets deployed per fisherman to increase since 1971. Increases have been particularly apparent since 1978 in the Escuminac area. In that area, increases have been about 45% over the 1971 level while in the Chaleur Bay area an increase of 81% was observed over the same interval. For the entire survey area, an average increase of 65% during 1971-79 was observed for fishermen who sell their catch to processors.

Number of Net-days and Catch Rates

An annual estimate of the average effort deployed by each fisherman in the survey area obtained by multiplying the reported number of days fished and the number of nets deployed, on a fisherman by fisherman basis. The results were averaged and presented in Table 24 and Figure 17. In all areas, the average number of net-days has increased dramatically since 1971. These increases have been particularly striking in the fall Chaleur Bay fishery where effort has almost tripled since 1971. The spring fishery

has exhibited an increase of 40-50%, much of this since 1977.

When the reported landing statistics (Table 25) are divided by the appropriate estimate of effort from Table 24 (for "processor" fishermen only), catch rates and thus relative abundance estimates on an area by area basis are derived (Table 26 and Figure 18). Note that the landings statistics presented in Table 25 have been grouped slightly differently than those given in Table 2. These indices are not to be considered absolute estimates of the catch rates. To calculate these, one would require information on the number of fishermen active in the fishery each year. Here we have in fact assumed that the number of fishermen involved per year is constant. There is evidence to suggest that the number of fishermen has in fact increased recently. Therefore the estimates of catch rate trends since 1977 are probably too high. Nevertheless, the trends in the earlier years are probably correct.

The catch rates of the spring (total) fishery have remained fairly constant since 1971 while those for the fall (Chaleur Bay) fishery declined dramatically during 1971-74 and have remained fairly stable thereafter.

Characterization of the Fish Population

The following comments were obtained during the interviews and pertain to biological aspects of the herring populations in the Gulf.

Distribution of spawners and juveniles: Spawning of herring was reported in virtually all districts in the Gulf during the May to October period. Spawning activity in northern Nova Scotia is only observed during June, whereas spawning in districts 11 and 13 are observed in August-October (Figure 19). Spawning during the spring is also observed in most parts of P.E.I. and southern New Brunswick. From this, it can be seen that the spring fishery directs its effort on the spawning concentrations. The major catches occur when the fish move inshore to spawn.

Spawning in the fall is observed in statistical districts 88, 92, 66, 73, 75, 76 and, as mentioned above, districts 11 and 13. Most of these concentrations are fished during the fall. However, it was reported that the spawning concentrations that appear at the northwest and northeast tips of P.E.I. during the fall are not fished. The specific areas of sightings and relevant comments are given in Table 27.

The locations of these spawning sites agree quite well with the results of a survey carried out by Ware and Henriksen (1978). However, in our study spawning was found to occur in many areas not previously considered.

Juveniles (herring 6" to 8" in total length) were reported in many areas of the Gulf during the summer and fall but not during the spring (Figure 20). Unusually large numbers of juveniles were reported at the eastern end of P.E.I. during the fall of 1977 and summer of 1978. The specific areas of sighting and relevant comments are given in Table 28. In the Shediac area (statistical districts 77-78), there were reports of very small herring that appeared just after disappearance of the ice in the spring. These fish have a bluish tint and distinct flavour and are locally called blue fish. These "ice herring" are also observed just after ice breakage in statistical districts 83 and 85.

Catches of associated species: Results for catches of species reported in association with the herring catches are only available for Nova Scotia (Table 29). There, the species most commonly found in association with herring are mackerel and gaspereau. The percentage of mackerel in the catch varies from 17 to 50% while coincidental gaspereau catches remain around 14% of total weight landed. Alewives, cod and squid are also found in association with herring but not as frequently. There was one report from statistical district 2 that squid had been observed in great abundance during 1978-79 but this was not observed elsewhere.

Abundance trends and general comments: In Nova Scotia, most fishermen complained about a general decline in the number of fish, although, some stated that the situation had improved during 1978-79. In general, most fishermen find it becoming increasingly difficult to predict the time of arrival of the fish in the spring. As well, the size of the fish does not seem to have changed significantly over the 1970-79 period. However, most fishermen stated that the herring in their catches are bigger in July than in May. Nowhere do fishermen discard fish except if they have stayed in the nets too long and are thus rotten.

Only two districts in New Brunswick reported good catches in the spring of 1978, those being 63 (around New Mills) and 64 (at Petit Rocher). Elsewhere in the province, the fall catches were reported as being better than those in the spring. Always, the spring fish is carried out closer inshore than the fall fishery.

The fishermen in statistical districts 63-70 reported that the herring are generally bigger in 1979 than in previous years. No such change in size was observed in districts 73-80.

Many areas reported a general increase in fishing effort, both in number of nets and number and size of boats active in the fishery over the last 10 years. This was particularly true in districts 65-68, 73, 75-77 and 80.

Seals were mentioned as causing considerable damage to nets and thus influencing catch rates. This was reported in districts 70-76. There was a general feeling in these areas that the seal population was increasing and thus causing more and more damage.

Reports of catch rates from P.E.I. varied considerably from district to district. Most districts along the Northumberland Strait reported bad catches in 1978. Fishermen in statistical districts 87 and 88 felt that the

fall was the best time to fish herring while spring was the favoured season in districts 95 and 96. Both spring and fall fishing is carried out in districts 82 and 92 with an apparent decline in the fall catch rates in recent years.

As in New Brunswick, most areas in P.E.I. reported that herring appeared bigger in 1978. Only one area, statistical district 92, reported seals as being a problem in causing net damage.

Overall, the trend over the years has been to increase the number of nets used to compensate for declining abundance. Many fishermen blame the decline in fishing over the 1970-79 period on construction of the Canso Causeway and overfishing by the purse seiners and midwater trawlers. Fishermen from the Northumberland Strait area, and even as far north as Caraquet, claim that the herring no longer move into the Strait but now migrate on the north side of P.E.I.

The purse seiners were blamed for overfishing particularly in the Chaleur Bay area. Midwater trawl and purse seine overfishing were blamed for declines at the east end of P.E.I. In all other areas, these reports were similar.

In contrast to the above, recent catches in most areas were reported as improved and fishermen's expectations for 1980 were high. It seems likely that there will be an increase in spring and fall fishing effort in the short-term at least. Many fishermen plan on entering the fishery again after a long absence while others plan to increase their numbers of nets and try fishing in new areas.

CONCLUDING REMARKS

The present study was undertaken with the broad objective in mind of obtaining an understanding with the nature of the herring gillnet fishery in the southern Gulf of St. Lawrence during the 1971-79 period. The interviews with the fishermen proved very useful in the collection of general information pertinent to the nature of the fishing operations, such as vessel movement, general times and locations of the various fisheries, the type and use of the gear etc. As well, valuable information was obtained on the behaviour of the herring population itself. However, good quantitative data on trends in effort and catch rates were not available from the interviews for two major reasons. First, the coverage of the herring fishermen community was necessarily quite low and second, the interviews often did not permit time for the fisherman to consult his historical records (if present) on the fishery. The mail survey tended to be more successful than the interviews in the collection of data on effort. However it must be stated that proper drafting of the mail survey questions relied heavily on the experiences gained during the interviews.

From the results obtained in this survey, it was determined that, since about 1977, there has been a relatively rapid increase in the effort expended on the herring population by the gillnet fishermen. Although the catch rates since 1977 have remained stable, this condition may not continue if the effort continues to increase. It will become very important during the next five years to monitor the activities of the inshore fishermen to ensure that the Gulf herring stock is not overexploited. The information collected during this survey should serve as a valuable addition to existing data sets in the proper future management of this fishery.

ACKNOWLEDGEMENTS

We would like to sincerely thank the following people for the effort they employed in this work: Tom Stewart, who carried out the 1978 interview survey and summarization of that study's results; Faith Budden, who carried out the 1979 interview survey as well as exploration into the files of the district fisheries officers; Peggy McCalla, who did wonders with the drafting; Kevin Vessey, who assisted in the analysis of the mail survey results and last but not least, the inshore herring gillnet fishermen of the southern Gulf of St. Lawrence.

REFERENCES

Greendale, R. and H. Powles. 1980. La pêche côtière au hareng en Gaspésie, 1970-78. Can. Tech. Rep. Fish. Aquat. Sci. 945.

Paloheimo, J.E. and L.M. Dickie. 1963. Abundance and fishing success. Rapp. P.-v. Réun. Cons. Int. Explor. Mer., 155: 152-163.

Spénard, P. 1979. La pêche au hareng aux Iles-de-la Madeleine, 1900-1978. Fish. Mar. Serv. Tech. Rep. 876 F.

Tibbo, S.N., S.N. Messieh and C.D. Burnett. 1969. Catch statistics - length and age composition. Gulf of St. Lawrence herring. Fish. Res. Bd. Tech. Rep. 139.

Ware, D.M. and B.L. Henriksen. 1978. On the dynamics and structure of the southern Gulf of St. Lawerence herring stocks. Fish. Mar. Serv. Tech. Rep. 800.

Table 1a. 4T herring landings (mt) reported in the Maritimes (N.B., N.S., & P.E.I), by statistical district and month, for gill nets in 1967.

PROVINCE	S.D.	APR	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC	TOTAL
N.B.	63	4	67	9		3	11	1			95
	64	2	63	*	*	1	2				68
	65		1916	1115	13	816	845				4705
	66		322	100	17	831	852	4			2126
	67		209	97	3	122	228		3		662
	68		108	7	3	*	3	2			123
	70		248	*							248
	71										
	72										
	73		3580	870		32	74				4556
	75		541	208	1	9	52	10			821
	76		10	3	1	11	26				51
	77		45	17	1	*					63
	78		210	50	1						261
	80		515	113							628
P.E.I.	82		49	56	3	1	11	2			122
	83		261	386							647
	85										
	86										
	87			4	1		19				24
	88		17				*				17
	92		85	12	10	1	2				110
	93		17	24	2						43
	95			10							10
	96			1							1
N.S.	45			33							33
	46						1				1
	10										
	11					43	112	1			156
	12			*		*	7	2			9
	13		19	84	18	10	33	14			178
	3			*							*
	2			64	27	*					91
TOTAL		6	8282	3263	101	1880	2278	36	3		15849

* < .5 mt

Table 1b. 4T herring landings (mt) reported in the Maritimes (N.B., N.S. & P.E.I.), by statistical district and month, for gill nets in 1968.

PROVINCE	S.D.	APR	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC	TOTAL
N.B.	63	4	48	5	*	6	15	2			80
	64	4	27			20	5				56
	65	4	6057	24	40	2289	1014				9428
	66	12	137	*	111	894	1200				2354
	67		149	5		382	776				1312
	68	23	22	1	*						46
	70		80								80
	71										
	72										
	73	31	2787	192		298	114				3422
	75	6	1636	59		64	2	14			1781
	76	1	219	48		*		2			270
	77	1	58	1	1	*					61
	78	29	190	15	5	3					242
	80	40	359	6							405
P.E.I.	82	10	180	20	3	4	1				218
	83	1	603	245							849
	85		*								*
	86										
	87	4	19			7	14				44
	88				1						1
	92	195	131	10	*	*	*				336
	93	5	52	4							61
	95		*								*
	96										
N.S.	45		2								2
	46										
	10										
	11					134	171	3			308
	12					3	1	*			4
	13	3	49	140	1	6	11	7			217
	3			2							2
	2		5	36	*						41
TOTAL		373	12810	813	162	4110	3324	28			21620

* < .5 mt

Table 1c. 4T herring landings (mt) reported in the Maritimes (N.B., N.S. & P.E.I.), by statistical district and month, for gill nets in 1969.

PROVINCE	S.D.	APR	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC	TOTAL
N.B.	63	1	39	4	*	7	12	4	*		67
	64	16	40	2	3	11	8	2			82
	65	79	2573	14	412	1369	1085	4			5536
	66	22	193	23	972	1302	816				3328
	67	14	21		*	45	35	1			116
	68	11	17	5	3	3	5				44
	70		160								160
	71										
	72										
	73	91	3097	46	*	127	307	22			3690
	75	22	344	38		35	46	9			494
	76	1	6		*			2			9
	77	15	73	46	*						134
	78	16	380	31	4						431
	80	5	77	8	*						90
P.E.I.	82	17	62	100	1		4				184
	83	101	618	290							1009
	85										
	86										
	87	4	18				10				32
	88				2		*				2
	92	73		43			2				118
	93	*	61			1	*				62
	95	4	4	2							10
	96	3	7	1							11
N.S.	45		12								12
	46										
	10										
	11					148	185				333
	12					1					1
	13	3	71	66	4		14	7	1		166
	3		2								2
	2		20	67							87
TOTAL		498	7895	786	1401	3049	2529	51	1		16210

* < .5 mt

Table 1d. 4T herring landings (mt) reported in the Maritimes (N.B., N.S. & P.E.I.), by statistical district and month, for gill nets in 1970.

PROVINCE	S.D.	APR	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC	TOTAL
N.B.	63	7	27	5		3	1	2			45
	64	9	38	3			13	4			67
	65	89	1741	86	247	678	1689	23	5		4558
	66	96	293	3	426	580	1089	4			2491
	67	40	48		1	9	663				761
	68	75	29		1	16	20				141
	70		14								14
	71										
	72										
	73	188	1926	*	2	33	341	8			2498
	75	27	298	4		15	9	5			358
	76	7	32	7	*			1			47
	77	10	41	1	*						52
	78	52	320	46	20						438
	80	33	111	9		*					153
P.E.I.	82	16	41	5	*		29				91
	83	69	267	103	1		9	1			450
	85										
	86										
	87		54	14							68
	88					*	3				3
	92	23	138								161
	93	*	39			1	*				40
	95	5	5	2							12
	96	4	10								14
N.S.	45		1								1
	46										
	10										
	11						7	2			9
	12					1			2		3
	13	13	33	49	3		6				104
	3			4	2						6
	2		9	77							86
TOTAL		763	5515	418	703	1336	3879	50	7		12671

* ≤ .5 mt

Table 1e. 4T herring landings (mt) reported in the Maritimes (N.B., N.S. & P.E.I.), bystatistical district and month, for gill nets in 1971.

PROVINCE	S.D.	APR	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC	TOTAL
N.B.	63	4	16	4	*	6	6	2			38
	64	38	38	2		10	10	3			101
	65	58	516	38	200	1337	1719	4			3872
	66	26	88		183	769	948	3			2017
	67	22	213	68	25	727	1855	5	1		2916
	68	17			2	7	5				31
	70		121								121
	71										
	72										
	73	12	1072	35	*	110	356				1585
	75	11	142	65		12	43	17			290
	76	*	129	6	1						136
	77	8	109	8	*						125
	78	5	306	65	3						379
	80	3	72	138	2						215
P.E.I.	82	18	218	131	12	12	61	4			456
	83	105	696	122	17						940
	85										
	86										
	87						1				1
	88					*	2				2
	92	50	86	42			3				181
	93		8		5						13
	95	6	6								12
	96	2	5				1				8
N.S.	45		1	22							23
	46										
	10										
	11				*	396	448	36			880
	12					1	1	*			2
	13	25	43	30	2	2	6	1			109
	3		*	1							1
	2		*	60							60
TOTAL		410	3885	837	452	3389	5465	75	1		14514

* < .5 mt

Table 1f. 4T herring landings (mt) reported in the Maritimes (N.B., N.S. & P.E.I.), by statistical district and month, for gill nets in 1972.

PROVINCE	S.D.	APR	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC	TOTAL
N.B.	63		13	3			4	2			22
	64		24	1			7	1			33
	65		260	255	37	340	1600	2			2494
	66		77		9	313	877				1276
	67		16	1	4	402	435	2076			2934
	68		20	*	3		183				206
	70		143		*						143
	71										
	72										
	73		685	310	2	378	438	36			1849
	75		39	8	1	16	92	8			164
	76			1	1						2
	77			*	*						*
	78		17	201	82	29					329
	80		24	298	16						338
P.E.I.	82		1	11	1	6	12				31
	83		171	68	4		9				252
	85										
	86										
	87		2	2			*				4
	88				*		2				2
	92		25	6		*	*	*			31
	93		5	13							18
	95		4	2							6
	96		4	7							11
N.S.	45										
	46		*	1							1
	10										
	11				2	110	304	25			441
	12				*	*	1				1
	13		18	21	5	1	*	5			50
	3			7	5						12
	2		*	2	5						7
TOTAL			1548	1218	177	1595	3964	2155			10657

* < .5 mt

Table 1g. 4T herring landings (mt) reported in the Maritimes (N.B., N.S. & P.E.I.), by statistical district and month, for gill nets in 1973.

PROVINCE	S.D.	APR	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC	TOTAL
N.B.	63		30	9	*	3	4	2			48
	64	1	21	1			2	1			26
	65	*	712	608	1	157	485	6			1969
	66	4	152			173	243	2			574
	67	*	45	660	37	948	325	13			2028
	68	5	26		*						31
	70		227		*	210	180				617
	71	1									1
	72										
	73	8	2863	73	3	1026	1063				5036
	75	4	9	12	*	66	272	25			388
	76	1	1	1	6	2	*				11
	77			*	29						29
	78		182	156	45						383
	80	3	115	77	2						197
P.E.I.	82	1	33	35	21	43	19	2			154
	83		280	125	19		3				427
	85										
	86										
	87		19		2	39	26				86
	88				*	2	*				2
	92		65	42	1		12				120
	93		7	28	2						37
	95		2								2
	96		9	3							12
N.S.	45										
	46										
	10										
	11				17	390	328	15			750
	12			1		1	*	7			9
	13		26	13	6	4	3				52
	3	9	2	12	3				*		26
	2			8							8
TOTAL		37	4826	1864	194	3064	2965	73	*		13023

* < .5 mt

Table 1h. 4T herring landings (mt) reported in the Maritimes (N.B., N.S. & P.E.I.), by statistical district and month, for gill nets in 1974.

PROVINCE	S.D.	APR	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC	TOTAL
N.B.	63	*	32	4			1	1			38
	64			31			9				40
	65		852	167	17	210	935	*			2181
	66		23	1	35	35	83	1			178
	67		8	6	68	33	362	50		9	536
	68	*	41	35	1			1			78
	70		150								150
	71										
	72										
	73		1988	244	*	204	473				2909
	75		28	14	*	1	29	2			74
	76	*	1	7	3						11
	77	*		3	7						10
	78	*	192	7	7		25				231
	80		46	118	48						212
P.E.I.	82		9	37	20	5	17	6			94
	83	*	249	6	1						256
	85										
	86										
	87					8					8
	88		5				3				8
	92		80	29			1	*			110
	93		*								*
	95	5	2								7
	96	6	8								14
N.S.	45		*								*
	46										
	10										
	11				20	229	100				349
	12						1				1
	13	1	9	9	3	1		3			26
	3	26	4	1							31
	2		*	5							5
TOTAL		38	3727	724	230	726	2039	64		9	7557

* < .5 mt

Table 11. 4T herring landings (mt) reported in the Maritimes (N.B., N.S., & P.E.I.), by statistical district and month, for gill nets in 1975.

PROVINCE	S.D.	APR	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC	TOTAL
N.B.	63	2	27	10	4	8	3	2			56
	64			32			12				44
	65		71	108	8	918	539	24			1668
	66	14	5	2	1	210	113	1			346
	67		7		3	90					100
	68	5	18	3	16	2					44
	70		94	1		3	26				124
	71										
	72										
	73		1263	332		241	721				2557
	75		56	7	*	24	36	2			125
	76		6	6	1						13
	77		13	3	1						17
	78		66	17	8						91
	80		27	25	3						55
P.E.I.	82	1	283	27	4	8	10	1			334
	83		307	90	4						401
	85										
	86										
	87										
	88		3								3
	92	1	31	32		*	4				68
	93		3	5	1						9
	95		2	3							5
	96		2	1							3
N.S.	45		1								1
	46										
	10										
	11				34	215	204				453
	12										
	13		9	21	*	*					30
	3		123	2							125
	2			5	*	*	*				5
TOTAL		23	2417	732	88	1719	1668	30			6677

* ≤ .5 mt

Table 1j. 4T herring landings (mt) reported in the Maritimes (N.B., N.S. & P.E.I.), by statistical district and month, for gill nets in 1976.

PROVINCE	S.D.	APR	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC	TOTAL
N.B.	63	2	35	5		4	4	2			52
	64	1		28		1	3				33
	65	5	348	238	7	545	573	30	1		1747
	66	1	5	1	3	28	160	12			210
	67				*	51	80	28			159
	68	7	11	1	*						19
	70		84								84
	71										
	72										
	73	8	2404	49		16	529				3006
	75	*	35								35
	76		1	*							1
	77	1		*							1
	78	1	74	5	12						92
	80	32	133	4	1						170
P.E.I.	82	2	43	3	2	11	8	1			70
	83	48	371	26							445
	85	2									2
	86	2	2								4
	87										
	88	2	2	7							11
	92	12	43	2	*	3	9	3			72
	93	*	22	4							26
	95	12	2								14
	96	5	6	5							16
N.S.	45		1								1
	46										
	10										
	11				74	112	240	14			440
	12						1				1
	13			4							4
	3		3	*							3
	2		1	7	*	*					8
TOTAL		143	3626	389	99	771	1607	90	1		6726

* < .5 mt

Table 1k. 4T herring landings (mt) reported in the Maritimes (N.B., N.S. & P.E.I.), by statistical district and month, for gill nets in 1977.

PROVINCE	S.D.	APR	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC	TOTAL
N.B.	63	3	11			2	4	1			21
	64	8									8
	65	10	213	5	26	655	128	11			1048
	66		12	2		425	328				767
	67		30	1	*	289	67	*			387
	68	14	7				2	12			35
	70		5								5
	71										
	72										
	73	2	1123	110		57	173				1465
	75	1	11								12
	76		1	2	*		10				13
	77			7							7
	78		90	13	3			15	108		229
	80	7	23	3							33
P.E.I.	82	2	10	16	7	*	2	1			38
	83	18	73	33	5						129
	85										
	86		7	3							10
	87					*					*
	88		6								6
	92	5	74	10	*	2	5	2			98
	93		1								1
	95		5	3							8
	96		10	7							17
N.S.	45										
	46										
	10										
	11				37	46	172	*			255
	12				*	1	1	*			2
	13			1		1	1		1		4
	3			6							6
	2		7	9	*						16
TOTAL		70	1719	231	78	1478	893	42	109		4620

* < .5 mt

Table 1L. 4T herring landings (mt) reported in the Maritimes (N.B., N.S. & P.E.I.), by statistical district and month, for gill nets in 1978.

PROVINCE	S.D.	APR	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC	TOTAL
N.B.	63	3	61	24	1		7	4			100
	64		69	26	6	1	1				103
	65		388	114	69	608	41	4	25		1249
	66		20		32	728	78	12			870
	67		1		8	416	7				432
	68	18	13	1	*	*	33	6			71
	70		36								36
	71		96								96
	72										
	73	1	2975	211	1	41	213	1			3443
	75	*	5	23							28
	76		37	13	27						77
	77				4	*					4
	78	2	46	5	62						115
	80	4	297	42							343
P.E.I.	82	2	242	23	7	*	4	11			289
	83		65	2							67
	85										
	86		6								6
	87					*	*				*
	88	*	20	1	4		1				26
	92	2	85	11	3	4	3	5			113
	93					*					*
	95		5								5
	96		20								20
N.S.	45										
	46	*									*
	10										
	11				41	138	61				240
	12					2	194				196
	13	*				1	7	1			9
	3			10	*		*	*			10
	2		13	10							23
TOTAL		32	4500	516	265	1939	650	44	25		7971

* < .5 mt

Table 1m. 4T herring landings (mt) reported in the Maritimes (N.B., N.S. & P.E.I.), by statistical district and month, for gill nets in 1979.

PROVINCE	S.D.	APR	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC	TOTAL
N.B.	63	2	59	2		6	4	*	*		73
	64	1	76	23	3	6	5	2			116
	65	1	183	170	21	51	31	83			540
	66		36	14	17	142	778	138			1125
	67	5	8	14	1		132	17			177
	68	25	29	12	*	5	7	*			78
	70		85	17							102
	71										
	72										
	73	12	2617	166	6	113	305				3219
	75		1								1
	76		2	*			42				44
	77			*							*
	78	2	123	1	46		*				172
	80	33	115	5							153
P.E.I.	82	1	87	18	*	1	13				120
	83	34	182								216
	85	*	*								*
	86	*						3			3
	87	1	1		4	52	80	1			139
	88	11	6		*	2	*	*			19
	92	10	258	11	2	7	51		*		339
	93	2	22	*	*						24
	95	6	43								49
	96	8	30								38
N.S.	45		3								3
	46		3								3
	10										
	11				174	454	286	1			915
	12					*	101	3			104
	13		17	1	4	3	8	*			33
	14		*								*
	3	52	3	8	2						65
	2		41	19			1				61
TOTAL		206	4030	481	280	842	1844	248	*		7931

* < .5 mt

Table 2. Reported landings of herring caught by gillnets in NAFO Division 4T, by year, season and area.

YEAR	AREA										
	1		2		3		4		TOTAL		GRAND TOTAL
	Spring	Fall	Spring	Fall	Spring	Fall	Spring	Fall	Spring	Fall	S + F combined
1967	4267	3760	7052	250	32	20	200	268	11551	4298	15849
1968	6602	6754	7134	511	23	22	237	337	13996	7624	21620
1969	3234	6099	5661	560	43	12	241	360	9179	7034	16210
1970	2603	5474	3813	475	94	3	186	23	6696	5975	12671
1971	1269	7827	3662	655	19	7	182	893	5132	9382	14514
1972	813	6295	1883	1131	21	2	49	463	2766	7891	10657
1973	2502	2792	4121	2661	33	69	71	774	6727	6296	13023
1974	1350	1851	3058	849	26	11	55	357	4489	3068	7557
1975	399	1983	2601	1069	11	0	161	453	3172	3505	6677
1976	772	1532	3323	595	47	0	16	441	4158	2568	6726
1977	321	1950	1635	390	41	0	23	260	2020	2600	4620
1978	870	2087	4093	386	52	5	33	445	5048	2923	7971
1979	762	1449	3702	586	106	142	147	1037	4717	3214	7931

Table 3. Number of fishermen interviewed during May-September, 1978-79, per statistical district of the southern Gulf of St. Lawrence.

	STATISTICAL DISTRICT	# FISHERMEN LICENCED DURING 1979	# INTERVIEWED	%
N.S.	2	50	8	16
	3	129	14	11
	10	3	0	0
	11	118	6	5
	12	23	0	0
	13	119	13	11
	45	13	2	15
	46	6	3	50
	Total	461	46	10
N.B.	63	77	7	9
	64-65	487	17	3
	66	267	7	3
	67	137	4	3
	68	100	3	3
	70	140	8	6
	71	25	0	0
	73	193	7	4
	75	164	2	1
	76	72	8	11
	77	100	4	4
	78	70	6	9
	80	85	4	5
	Total	1917	77	4
P.E.I.	82	135	6	4
	83	65	3	5
	85	14	4	29
	86	17	1	6
	87	138	6	4
	88	183	7	4
	92	236	12	5
	93	59	4	7
	95	85	6	7
	96	29	2	7
	Total	961	51	5
GRAND TOTAL:		3339	174	5

Table 4. Distribution of questionnaires mailed and returned in Nova Scotia, New Brunswick, and Prince Edward Island, for 1979.

Province	Statistical District	No. of questionnaires			Percentage of questionnaires		
		Mailed (A)	Total returned (B)	No reporting herring catch (C)	B/A	C/A	C/B
N.S.	2	50	18	10	36	20	56
	3	129	24	16	19	12	67
	10	3	0	0	0	0	0
	11	118	11	11	9	9	100
	12	23	6	5	26	22	83
	13	119	24	22	20	18	92
	45	13	4	2	31	15	50
	46	6	1	1	17	17	100
N.B.	63	77	17	15	22	19	88
	64	127	33	32	26	25	97
	65	360	125	92	35	26	74
	66	267	104	72	39	27	69
	67	137	31	26	23	19	84
	68	100	36	34	36	34	94
	70	140	86	55	61	39	64
	71	25	9	2	36	8	22
	73	193	104	95	54	49	91
	75	164	32	30	19	18	94
	76	72	14	11	19	15	78
	77	100	25	19	25	19	76
	78	70	18	13	25	19	72
	80	85	26	16	30	19	61
P.E.I.	82	135	6	6	4	4	100
	83	65	10	10	15	15	100
	85	14	3	3	21	21	100
	86	17	4	1	24	6	25
	87	138	25	20	18	14	80
	88	183	32	28	17	15	88
	92	236	24	21	10	9	87
	93	59	9	8	15	14	89
	95	85	15	14	18	16	93
	96	29	10	8	34	28	80
	N.K.		3	2			
Total		3339	888	701	27	21	79

Table 5. Number of responses to mail survey indicating year quarter during which herring fishing activity is most intense.

Province	Statistical District	Quarter of the year 1	2	3	4	none
Novia Scotia	2	-	8	1	-	-
	3	1	14	2	-	-
	11	-	1	13	-	-
	12	-	2	3	-	-
	13	-	16	11	4	-
	45	-	2	-	-	-
	46	-	1	-	-	-
Total:		1 (1%)	44 (56%)	30 (38%)	4 (5%)	0
New Brunswick	63	-	15	-	-	-
	64	-	27	8	-	-
	65	3	61	45	15	-
	66	-	27	49	19	1
	67	1	15	19	5	-
	68	-	27	5	4	-
	70	-	48	1	-	-
	71	-	1	-	-	-
	73	-	88	21	8	-
	75	-	28	4	1	-
	76	-	10	3	-	-
	77	-	16	3	1	-
	78	-	13	1	1	-
	80	-	14	-	-	-
Total:		4 (1%)	390 (64%)	159 (26)	54 (9%)	1 (<1%)
Prince Edward Island	82	-	6	2	1	-
	83	-	10	0	0	-
	85	-	3	0	0	-
	86	-	1	1	1	-
	87	-	13	8	4	-
	88	-	26	1	0	-
	92	-	17	8	1	-
	93	-	6	2	0	-
	95	-	13	1	0	-
	96	-	8	2	2	-
Total:		-	103 (75%)	25(18%)	9 (7%)	-

Table 6. Starting and finishing dates for the period of peak catch rate during the spring fishing season per statistical district, for 1970 to 1979, as determined by the interview survey.

Province	Statistical District	Starting date	Finishing date	Number of observations
N.S.	2	6th May	19th May	5
	3	29th May	10th June	13
	13	14th June	27th June	10
	11	15th June	6th July	5
	46	16th June	15th July	2
	45	26th June	15th July	2
N.B.	63	1st May	15th May	
	64-65	1st May	22nd May	
	66	-	-	
	67	-	-	
	68	11th May	17th May	Data Lost in BIO Fire
	70	1st May	15th May	
	73	11th May	17th May	
	75	11th May	17th May	
	76	-	-	
	77	25th July	30th July	
	78	1st May	7th May	
	80	11th May	17th May	
P.E.I.	82	27th April	1st May	
	83	1st May	15th May	
	85	1st May	-	
	86	-	-	
	87	-	-	
	88	1st May	15th May	
	92	8th May	28th May	
	93	(three to four days after the ice is gone)		
	95	27th April	5th May	
	96	27th April	5th May	

Table 7. Starting and finishing date for the period of peak catch rate during the fall fishing season, per statistical district, for 1970 to 1979, as determined by the interview survey.

Province	Statistical District	Starting date	Finishing date	Number of observations
N.S.	2	1st Oct.	1st Nov.	1
	3	1st Sept.	6th Sept.	4
	13	1st Sept.	8th Sept.	6
	11	1st Sept.	18th Sept.	4
	46	1st July	30th July	1
N.B.	63	--	--	Data Lost in BIO Fire
	64-65	11th Sept.	5th Oct.	
	66	28th Aug.	3rd Oct.	
	67	24th Aug.	30th Aug.	
	68	10th Aug.	16th Aug.	
	70	-	-	
	73	14th Sept.	20th Sept.	
	75	-	-	
	76	1st Aug.	14th Sept.	
	77	-	-	
	78	-	-	
	80	-	-	
P.E.I.	82	-	-	
	83	-	-	
	85	-	-	
	86	10th Aug.	16th Aug.	
	87	-	-	
	88	1st Sept.	30th Sept.	
	92	-	-	
	93	-	-	
	95	-	-	
	96	-	-	

Table 8. Fishing grounds of fishermen resident in Nova Scotia, New Brunswick, and Prince Edward Island during the 1970-78 spring and fall fishing seasons as determined by the interview survey.

Province	Home port Statistical district	Fishing areas Spring	Fall
N.S.	2	½-15 miles off coast	—
	3	½-15 miles off coast	—
	13	Georges Bay	—
	11	2-5 miles out in Northumberland Strait	—
	46	½-10 miles out in Northumberland Strait	—
	45	½-10 miles out in Northumberland Strait	—
N.B.	63	Locally	—
	64-65	Locally & Quebec shore	Quebec shore (from Port Daniel to Gaspé), Miscou & Escuminac as well as locally
	66	Locally	Locally as well as Quebec shore (Port Daniel to Gaspé)
	67	Locally & Quebec shore	Quebec shore (Port Daniel to Paspediac) & Caraquet, Miscou & Escuminac
	68	Locally	Quebec shore (Port Daniel to Paspediac) & Caraquet
	70	Locally & Escuminac	Quebec shore (Port Daniel to Paspediac) Caraquet, Miscou & Cap Richibucto
	73	Locally	Gaspé, Caraquet, Miscou, Richibucto & Point Sapin
	75	Locally & Escuminac	—
	76	Escuminac	Escuminac
	77	Locally & Escuminac	Locally & Escuminac

Table 8. Continued

Province	Home portal Statistical district	Fishing areas Spring	Fall
N.B.	78	Locally at Shediac & Cape Pelé & Escuminac	Escuminac
	80	Locally & P.E.I. south shore (Borden area)	Locally
P.E.I.	82	Escuminac, Miminegash Campbellton, West Point, Borden, Howard Cove	--
	83	Escuminac, Cape Pelé, Cape Egmont, Miminegash to Borden	--
	85	Locally	--
	86	Locally	--
	87	Beach Point to Escuminac	Locally
	88	Locally	Locally
	92	Locally & Escuminac	Locally
	93	Locally	--
	95	Locally	--
	96	Locally	--

Table 9. Responses (in percentage) from fishermen indicating their percentage of fishing time spent herring fishing.

Province	Statistical District	Percentage of fishing time spent fishing					Total
		< 10%	25%	50%	75%	100%	
N.S.	2	67	33				100
	3	80	20				100
	11	17	25	41	17		100
	12	80	20				100
	13	55	32	13			100
	45	50	50				100
	46	100					100
N.B.	63	29	57	14			100
	64	37	30	23	3	7	100
	65	42	23	17	10	8	100
	66	28	28	38	6		100
	67	15	54	19	4	8	100
	68	50	50				100
	70	66	30	4			100
	71	100					100
	73	17	48	23	9	3	100
	75	37	37	16	10		100
	76	20	60	20			100
	77	44	44	12			100
	78	17	58			25	100
	80	22	64	7	7		100
P.E.I.	82	50	50				100
	83	10	70		10	10	100
	85	33	67				100
	86		100				100
	87	67	33				100
	88	38	62				100
	92	48	42	5		5	100
	93	63	37				100
	95	79	21				100
	96	50	50				100

Table 10. Responses (in number) from fishermen indicating the season of the year in which they fish. (S-spring, F-fall, B-both, T-Total).

Prov.	Statistical District	1971				1972				1973				1974				1975				1976				1977				1978				1979			
		S	F	B	T	S	F	B	T	S	F	B	T	S	F	B	T	S	F	B	T	S	F	B	T	S	F	B	T	S	F	B	T	S	F	B	T
N.S.	2	4	–	1	5	5	–	1	6	5	–	1	6	6	–	1	7	6	–	1	7	6	–	1	7	6	–	1	7	6	–	2	8	6	–	2	8
	3	6	–	1	7	6	–	1	7	6	–	1	7	5	–	1	6	5	–	2	7	6	–	3	9	6	–	3	9	7	–	3	10	9	–	3	12
	11	–	5	–	5	–	5	–	5	–	5	–	5	–	6	–	6	–	6	–	6	–	6	–	6	–	7	–	7	–	8	–	8	–	11	–	11
	12	–	–	1	1	–	–	1	1	–	–	1	1	–	–	1	1	–	–	1	1	–	–	1	1	1	1	1	3	1	1	1	3	1	2	1	4
	13	5	1	1	7	5	1	1	7	5	1	1	7	3	1	1	5	4	1	1	6	5	2	2	9	6	2	2	10	6	4	4	14	7	4	5	17
	45	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–	1	2
	46	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–	1	1	–	–	1	–	–	–	–	1	–	–	1
	63	7	–	1	8	8	–	1	9	8	–	1	9	8	–	1	9	8	–	1	9	8	–	1	9	8	–	2	10	8	–	2	10	13	–	1	14
	64	10	–	4	14	10	–	4	14	10	–	4	14	9	–	4	13	11	–	3	14	11	–	4	15	11	–	6	17	12	–	7	19	17	–	8	25
	65	20	9	7	36	20	9	7	36	20	9	8	37	20	12	7	39	21	11	8	40	20	13	8	41	23	16	10	49	24	16	12	52	35	17	18	70
	66	6	7	8	21	5	7	10	22	5	8	11	24	8	8	10	26	7	10	12	29	6	10	11	27	9	11	10	30	10	14	16	40	11	21	24	56
	67	1	1	4	6	1	1	4	6	1	1	4	6	3	3	3	9	5	2	4	11	4	2	4	10	4	2	4	10	5	3	3	11	7	5	8	20
	68	10	–	2	12	10	–	2	12	11	–	2	13	11	–	2	13	13	–	3	16	10	–	4	14	10	–	4	14	11	–	3	14	16	1	6	23
	70	20	–	2	22	21	–	2	23	20	–	2	22	21	–	2	23	26	–	3	29	26	–	1	27	29	–	1	30	31	–	2	33	38	–	2	40
	71	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–	1	1	–	–	1	1	–	–	1	1	–	–	1
	73	26	1	3	30	27	2	3	32	28	2	4	34	28	2	4	34	29	2	6	37	32	2	5	39	33	2	6	41	52	1	7	60	70	1	14	85
	75	13	–	1	14	13	–	1	14	13	–	1	14	12	–	1	13	12	–	1	13	13	–	1	14	14	–	1	15	13	–	1	14	22	1	2	25
	76	4	–	–	4	4	–	–	4	4	–	–	4	4	–	–	4	4	–	–	4	5	–	–	5	5	–	–	5	4	1	1	6	7	1	1	9
	77	5	–	–	5	5	–	–	5	5	–	–	5	5	–	–	5	6	–	–	6	5	–	–	5	5	–	–	5	9	1	–	10	16	–	–	16
	78	4	–	–	4	3	–	–	3	3	–	–	3	3	–	–	3	3	–	–	3	5	–	–	5	7	–	–	7	6	–	–	6	10	–	–	10
	80	2	–	–	2	2	–	–	2	2	–	–	2	3	–	–	3	3	–	–	3	3	–	–	3	6	–	–	6	8	–	–	8	15	–	–	15
P.E.I.	82	3	–	1	4	3	–	1	4	3	–	1	4	3	–	1	4	3	–	1	4	3	–	1	4	3	–	1	4	3	–	1	4	5	–	1	6
	83	5	–	–	5	5	–	–	5	5	–	–	5	6	–	–	6	7	–	–	7	5	–	–	5	5	–	–	5	7	–	–	7	8	–	–	8
	85	1	–	–	1	1	–	–	1	1	–	–	1	1	–	–	1	1	–	–	1	1	–	–	1	1	–	–	1	2	–	–	2	2	–	–	2
	86	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	1
	87	1	1	1	3	2	1	1	4	2	1	1	4	2	1	1	4	3	1	2	6	3	1	2	6	4	1	3	8	5	3	3	11	9	5	3	17
	88	8	–	–	8	8	–	–	8	8	–	–	8	9	–	–	9	12	–	1	13	13	–	1	14	14	–	1	15	15	–	1	16	24	–	1	25
	92	5	–	1	6	5	–	1	6	5	–	1	6	6	–	1	7	5	–	3	8	9	–	2	11	11	–	2	13	9	–	4	13	10	–	5	15
	93	3	–	1	4	3	–	1	4	3	–	1	4	3	–	1	4	3	–	1	4	2	–	2	4	1	–	2	3	2	–	2	4	3	–	2	5
	95	6	–	1	7	7	–	1	8	7	–	1	8	9	–	–	9	8	–	1	9	8	–	1	9	9	–	1	10	12	–	1	13	13	–	1	14
	96	1	–	–	1	1	–	–	1	1	–	–	1	1	–	–	1	3	–	–	3	2	–	2	4	3	–	2	5	3	–	2	5	4	–	4	8

Table 11. Responses from fishermen indicating the number of years spent herring fishing.

Province	Statistical District	Years spent herring fishing 1-5	6-10	11-20	21-30	>30	Total no. of responses
N.S.	2		3	2	2	2	9
	3	5	2	3	3	1	14
	11	2	3	3		3	11
	12	2		1		2	5
	13	7	2	7	2	3	21
	45		1	1			2
	46				1		1
N.B.	63	2	2	3	5	3	15
	64	6	2	3	9	8	28
	65	19	14	26	11	15	85
	66	24	11	16	7	7	65
	67	2	9	7	4	4	26
	68	6	10	8	1	4	29
	70	13	13	12	10	4	52
	71	1					1
	73	26	12	27	15	8	88
	75	8	6	7	3	4	28
	76	4		3	2	1	10
	77	4	3	5	3	4	19
	78	4	1	3	5		13
	80	8	1	3	2	1	15
P.E.I.	82	1	1	2	1	1	6
	83	2	1	2	3	2	10
	85	1		1		1	3
	86			1			1
	87	4	5	3	4	3	19
	88	7	4	6	5	2	24
	92	8	3	4	1	1	17
	93			1	4	3	8
	95	2	3		3	5	13
	96	5		1	1	1	8

Table 12. Use of herring catches by fishermen (Percent Returns) during 1979, in the statistical districts bordering the Gulf of St. Lawrence, broken down by fishing season (A - sale to processors, B - sale to individuals, C - personal use).

Province	Statistical District	Spring			Fall			Both			Total no Respondents
		A	B	C	A	B	C	A	B	C	
N.S.	2	-	-	100	-	-	-	-	-	100	9
	3	11	-	89	-	-	-	-	33	67	11
	11	-	-	-	48	24	28	-	-	-	11
	12	-	-	100	-	-	100	-	-	100	4
	13	10	10	80	38	36	25	38	-	62	17
	45	-	50	50	-	-	-	-	-	100	2
	46	-	-	100	-	-	-	-	-	-	1
N.B.	63	17	35	48	-	-	-	50	-	50	14
	64	24	12	64	-	-	-	33	25	42	24
	65	31	5	64	65	15	20	67	-	33	73
	66	8	-	92	83	9	8	66	-	34	53
	67	38	8	54	57	14	29	58	-	42	21
	68	20	10	70	-	-	100	36	9	55	22
	70	10	10	80	50	-	50	-	-	100	42
	71	-	50	50	-	-	-	-	-	-	2
	73	68	15	17	100	-	-	58	16	26	85
	75	54	14	32	50	50	-	100	-	-	25
	76	71	29	-	100	-	-	33	33	34	9
	77	52	10	38	-	-	-	-	-	-	16
	78	38	31	31	-	-	-	-	-	-	11
	80	75	-	25	-	-	-	-	-	-	14
P.E.I.	82	71	14	15	-	-	-	50	50	-	6
	83	56	6	38	-	-	-	-	-	-	10
	85	-	50	50	-	-	-	-	-	-	3
	86	-	-	-	-	-	-	-	-	100	1
	87	18	-	82	50	33	17	33	17	50	18
	88	8	4	88	-	-	-	-	-	100	23
	92	36	18	46	-	-	-	33	55	12	16
	93	-	-	100	-	-	-	25	25	50	6
	95	-	-	100	-	-	-	-	100	-	14
	96	-	-	100	-	-	-	-	20	80	8

Table 13. Type of gill nets employed by the fishermen interviewed in Nova Scotia during May-September 1979.

Statistical District	Gill net set	Gill net drift	Total
2	6	2	8
3	14		14
13	12	1	13
11	6		6
46	3		3
45	2		2

Table 14. Rank of importance given to certain criteria in the choice of fishing location in Nova Scotia, as determined by the interview survey.

District	Tide	Currents	Bottom type	T°	Presence of other species	Time	Migration of fish	Experience	Wind
2	1	2	4	4	2	3	1	2	1
3	3	3	5	5	2	4	1	4	2
13	4	4	5	4	2	4	1	4	2
11	4	3	5	4	3	4	1	3	2
46	3	4	4	4	3	4	1	3	2
45	4	2	5	4	3	3	1	4	2

Table 15. Mean length and tonnage of boats employed to set the gill nets, per statistical district in Nova Scotia during 1970-79, as determined by the interview survey.

Statistical District	Mean Length (feet)	SD.	NO.	Mean tonnage	SD.	NO.
2	32.14	3.50	7	8.77	2.71	7
3	32.29	3.43	14	7.85	2.37	14
13	30.77	5.72	13	8.45	3.17	11
11	34.50	11.01	6	8.00	2.28	6
46	30.67	5.66	3	6.50	2.12	2
45	34.00		2	8.75	4.60	2

Table 16. Mean length (ft) of gill nets per fisherman per statistical district in Nova Scotia, New Brunswick, and Prince Edward Island, during the 1970-79 spring and fall fishing seasons, and as determined by the interview survey.

Province	Statistical districts	Mean length (feet)	Range (feet)	Number of responses
N.S.	2	281.25	150-300	8
	3	177.43	54-300	14
	13	157.29	75-450	10
	11	148.50	66-300	6
	46	60.00	—	1
	45	187.50	175-200	2
N.B.	63	104.4		7
	64-65	115.1		17
	66	111.0		7
	67	118.2		4
	68	97.8		3
	70	97.5		8
	73	85.20		7
	75	87.00	Data Lost in	2
	76	99.00	BIO Fire	8
	77	90.00		4
	78	129.00		6
	80	63.00		4
P.E.I.	82	114.00		6
	83	105.00		3
	85	114.00		4
	86	90.00		1
	87	105.00		6
	88	116.00		7
	92	97.5		12
	93	100.80		4
	95	100.2		6
	96	96.00		2

Table 17. Mean depth (in meshes) of gill nets per statistical district in Nova Scotia, New Brunswick, and Prince Edward Island during the spring and fall fishing season as determined by the interview survey (1970-78).

Province	Statistical District	Depth (mesh) in spring	Depth (mesh) in fall	No. of observations
N.S.	2	88	-	8
	3	100	-	14
	13	96	-	13
	11	81	-	6
	46	50	-	3
	45	91	-	2
N.B.	63	50	-	7
	64-65	83	105	17
	66	117	138	7
	67	100	113	4
	68	75	150	3
	70	53	142	8
	73	95	100	7
	75	50	-	2
	76	63	100	8
	77	50	100	4
	78	50	125	6
	80	50	50	4
P.E.I.	82	53	-	6
	83	50	-	3
	85	50	-	4
	86	75	-	1
	87	75	150	6
	88	63	150	7
	92	50	150	12
	93	88	-	4
	95	63	-	6
	96	56	-	2

Table 18. Occurrence of gill net mesh sizes (nearest ¼ inch) per statistical district in Nova Scotia, New Brunswick, and Prince Edward Island, during the 1970-79 spring fishing season, as determined by the interview survey.

Province	Statistical District	Mesh size (inches)					
		1 ¼	2	2 ¼	2 ½	2 3/4	3
N.S.	2			X	X	X	X
	3	X	X	X	X		
	13				X	X	
	11				X		
	46				X	X	
	45				X		
N.B.	63				X	X	
	64-65			X	X	X	X
	66			X	X	X	
	67				X		
	68			X	X		
	70			X	X		
	73		X	X			
	75			X	X		
	76			X	X		
	77			X			
	78		X	X			
	80		X	X	X		
P.E.I.	82		X	X	X		
	83		X	X			
	85		X	X	X		
	86					X	
	87			X		X	
	88			X	X		
	92		X	X	X		
	93		X	X	X		
	95		X	X		X	
	96		X				

Table 19. Occurrence of gill net mesh sizes (nearest ¼ inch) per statistical district in New Brunswick, and Prince Edward Island during the 1970-79 fall fishing season, as determined by the interview survey.

Province	Statistical District	Mesh size (inches)					
		1 ¼	2	2 ¼	2 ½	2 3/4	3
N.B.	64-65				X	X	
	66				X	X	
	67				X		
	68				X		
	70				X	X	
	73				X		
	76				X	X	X
	77					X	
	78				X	X	X
	80		X	X	X		
P.E.I.	87				X		
	88				X		X
	92					X	

Table 20. Frequency of occurrence of gill net mesh sizes (nearest ¼ inch) per statistical district in Nova Scotia, during the 1970-79 fishing season, as determined by the interview survey.

Statistical district	Mesh size (inches)					Total
	1¼	2	2¼	2½	3	
2			1	5	5	12
3	1	1	1	23		26
13				9	1	10
11				10		10
46				1	3	4
45				3		3
Total	1	1	2	51	9	65

Table 21. Mean number of nets set per fisherman per statistical district in Nova Scotia, New Brunswick, and Prince Edward Island during the 1970-79 spring and fall fishing seasons, as determined by the interview survey.

Province	Statistical districts	no. in spring	range	no. in fall	number of responses
N.S.	2	1.41	0-3	-	8
	3	1.44	0-3	-	14
	13	2.64	0-6	-	13
	11	7.50	2-12	-	6
	46	3.33	0-6	-	3
	45	5.00	4-6	-	2
N.B.	63	6		-	7
	64-65	14		13	17
	66	13		12	7
	67	20		13	4
	68	8		8	3
	70	10		7	8
	73	58		23	7
	75	52		-	2
	76	17	Data Lost in	19	8
	77	30	BIO Fire	30	4
	78	29		29	6
	80	33		33	4
P.E.I.	82	24		-	6
	83	52		-	3
	85	10		-	4
	86	3		-	1
	87	2		4	6
	88	2		2	7
	92	23		12	12
	93	6		-	4
	95	9		-	6
	96	11		-	2

Table 22. Average number of days spent herring fishing by each fisherman for 1971-1979, as derived from mail survey. ( ) - number of observations. Note: due to data gaps, the number of observations in each area when sumed do not equal the total number of observations.

A. Fishermen who sell their catch solely to processors

Year	Spring			Fall	Total Survey Area
	Chaleur* Area	Escuminac Area	Total Spring	Chaleur Area	
1971	42.8 (4)	31.87 (30)	33.15 (34)	52.6 (10)	38.23 (48)
1972	69.0 (5)	32.68 (34)	37.33 (39)	53.2 (10)	41.13 (52)
1973	68.0 (5)	31.81 (32)	36.70 (37)	50.3 (10)	40.24 (50)
1974	39.2 (5)	32.03 (33)	32.97 (38)	49.8 (13)	38.17 (54)
1975	41.5 (4)	31.79 (34)	32.82 (38)	51.9 (14)	38.80 (55)
1976	61.3 (7)	29.19 (36)	34.42 (43)	56.9 (14)	40.62 (60)
1977	39.2 (5)	30.03 (38)	31.09 (43)	54.3 (19)	38.77 (66)
1978	39.2 (5)	28.76 (54)	29.30 (60)	53.1 (22)	36.04 (89)
1979	35.8 (6)	28.92 (85)	29.27 (92)	61.5 (27)	37.20 (129)

B. Fishermen who sell their catch for bait during spring fishery

Year	Chaleur* Area	Escuminac Area	Remaining Districts	Total Survey Area
1971	46.30 (27)	29.48 (27)	40.16 (31)	39.22 (83)
1972	46.54 (26)	29.46 (28)	40.84 (32)	39.36 (84)
1973	46.81 (26)	30.12 (25)	40.91 (32)	40.04 (81)
1974	47.58 (26)	30.04 (26)	43.89 (36)	41.42 (86)
1975	45.26 (23)	29.10 (30)	39.02 (44)	37.84 (95)
1976	48.70 (33)	31.78 (37)	39.34 (47)	39.97 (115)
1977	49.19 (31)	31.08 (39)	39.06 (53)	39.34 (119)
1978	48.83 (35)	29.90 (40)	38.17 (54)	38.72 (125)
1979	47.25 (53)	30.76 (58)	36.31 (74)	37.83 (179)

* Groupings of Statistical districts used:

Chaleur Bay - 63, 64, 65, 66, 67, 68;

Escuminac - 70, 73, 75, 76, 77, 78, 80, 82, 83, 92.

Table 23. Average number of nets deployed per day by each fisherman during each fishing season from 1971-1979, as derived from mail survey. ( ) - number of observations.
Note: due to data gaps, the number of observations in each area when sumed do not equal the total number of observations.

A. Fishermen who sell their catch solely to processors

Year	Spring			Fall	
	Chaleur* Area	Escuminac Area	Total Spring	Chaleur Area	Total Survey Area
1971	5.25 (4)	26.78 (23)	23.59 (27)	5.22 (9)	18.00 (39)
1972	5.25 (4)	28.50 (30)	25.76 (34)	6.80 (10)	20.47 (47)
1973	5.25 (4)	29.33 (30)	26.50 (34)	7.10 (10)	21.17 (47)
1974	5.25 (4)	27.34 (29)	24.67 (33)	7.55 (11)	20.17 (47)
1975	6.00 (5)	32.81 (32)	29.19 (37)	7.17 (12)	23.40 (52)
1976	6.33 (6)	33.50 (36)	29.62 (42)	8.86 (14)	24.05 (59)
1977	8.40 (5)	31.69 (35)	28.78 (40)	9.33 (18)	22.19 (62)
1978	8.60 (5)	33.02 (48)	30.93 (54)	11.38 (24)	24.15 (85)
1979	9.50 (6)	38.74 (80)	36.97 (87)	11.92 (25)	29.78 (122)

B. Fishermen who sell their catch to individuals or retain for personal use

Year	Spring			Total Survey Area
	Chaleur* Area	Escuminac Area	Remaining Districts	
1971	5.18 (28)	15.85 (27)	8.62 (29)	9.62 (82)
1972	4.50 (28)	16.77 (30)	7.61 (33)	9.51 (89)
1973	4.61 (28)	16.96 (27)	7.61 (33)	9.35 (86)
1974	5.12 (25)	14.79 (24)	8.10 (29)	9.00 (76)
1975	6.04 (23)	15.52 (33)	7.30 (43)	9.60 (97)
1976	5.26 (34)	14.08 (37)	4.41 (46)	7.56 (115)
1977	6.18 (28)	16.85 (39)	5.37 (49)	9.12 (112)
1978	5.78 (32)	15.81 (42)	6.22 (55)	8.90 (125)
1979	5.60 (52)	16.78 (59)	6.86 (70)	9.01 (175)

* Groupings of Statistical districts used:

Chaleur Bay - 63, 64, 65, 66, 67, 68;

Escuminac - 70, 73, 75, 76, 77, 78, 80, 82, 83, 92.

Table 24. Average number of net-days expended by each herring fishermen during each fishing season from 1971-1979, as derived from mail survey. ( ) - number of observations.
Note: due to data gaps, the number of observations in each area when summed do not equal the total number of observations.

A. Fishermen who sell their catch to processors

Year	Spring			Fall	Total Survey Area
	Chaleur* Area	Escuminac Area	Total Spring	Chaleur Area	
1971	231.5 (4)	789.39 (23)	706.74 (27)	270.4 (9)	576.18 (39)
1972	225.0 (4)	872.38 (29)	793.91 (33)	376.1 (10)	671.85 (46)
1973	220.0 (4)	878.07 (29)	798.30 (33)	358.0 (10)	674.98 (46)
1974	226.5 (4)	784.32 (28)	714.59 (32)	507.9 (11)	667.43 (46)
1975	236.5 (4)	1001.16 (32)	916.19 (36)	415.2 (12)	788.49 (51)
1976	242.2 (5)	898.83 (35)	816.75 (40)	501.9 (14)	735.88 (57)
1977	279.2 (5)	915.18 (34)	833.64 (39)	564.4 (17)	743.90 (60)
1978	289.2 (5)	957.50 (48)	884.89 (54)	627.4 (20)	792.53 (81)
1979	288.3 (6)	1158.24 (78)	1097.33 (85)	786.1 (23)	983.86 (118)

B. Fishermen who sell their fish to individuals or retain for personal use

Year	Spring			Total Survey Area
	Chaleur* Area	Escuminac Area	Remaining Districts	
1971	171.25 (23)	339.07 (22)	139.84 (27)	194.90 (70)
1972	161.26 (24)	330.00 (26)	129.44 (31)	185.79 (79)
1973	166.72 (23)	335.29 (23)	133.31 (31)	186.92 (75)
1974	194.57 (21)	322.43 (21)	140.71 (27)	199.30 (67)
1975	205.72 (18)	305.18 (28)	138.31 (41)	193.14 (85)
1976	207.14 (31)	276.30 (34)	107.93 (43)	174.22 (106)
1977	249.56 (27)	353.65 (36)	123.74 (49)	200.26 (108)
1978	226.90 (30)	333.89 (39)	141.49 (54)	203.04 (119)
1979	201.70 (48)	348.87 (55)	147.54 (69)	202.78 (166)

* Groupings of Statistical districts used:

Chaleur Bay - 63, 64, 65, 66, 67, 68;

Escuminac - 70, 73, 75, 76, 77, 78, 80, 82, 83, 92.

Table 25. Reported landings (mt) by inshore herring fishermen during each fishing season from 1971-1979, as compiled by Maritimes Economic Division.

	Spring Fishery			Fall	Combined
Year	Chaleur Bay Area	Escuminac Area	Total Spring	Chaleur Bay Area	Entire Survey Area
1967	4019	7259	11551	3760	15849
1968	6522	7180	13996	6754	21620
1969	3074	5760	9179	6099	16210
1970	2589	3788	6696	5474	12671
1971	1148	3775	5132	7827	14514
1972	370	2008	2766	6295	10657
1973	2274	4314	6727	2402	13023
1974	1200	2743	4489	1851	7557
1975	304	2688	3172	1954	6677
1976	688	3381	4158	1532	6726
1977	316	1639	2020	2266	4620
1978	738	4225	5048	2087	7971
1979	660	3780	4717	2109	7931
1980	807	2430	3386	1118	7083

Table 26. Relative catch per unit effort (mt/net-day) experienced by inshore herring fishermen who sell their catch to processors, during each fishing season from 1971-1979, as derived from mail survey.

	Spring fishery			Fall	Combined
Year	Chaleur Bay Area	Escuminac Area	Total Spring	Chaleur Bay Area	Entire Survey Area
1971	4.96	4.78	7.26	28.95	25.19
1972	1.64	2.30	3.48	16.74	15.86
1973	10.34	4.91	8.43	6.71	19.29
1974	5.30	3.50	6.28	3.64	11.32
1975	1.29	2.68	3.46	4.71	8.47
1976	2.84	3.42	5.09	3.05	9.14
1977	1.13	1.79	2.42	4.01	6.21
1978	2.55	4.41	5.70	3.33	10.06
1979	2.29	3.26	4.30	2.68	8.06

Table 27. Reports of spawning activity during 1978-79 for each statistical district as determined by the interview survey.

Province	Statistical District	Spawning time	Comments
N.S.	2	July	--
	3	June-July	Spawning observed around shoals (off Coal Mine Point) and Islands.
	13	Mid May-July Sept.-Oct.	Spawning in Ballantyne cove in fall.
	11	June-Sept.	Around Pictou Island in July to Sept.
	46	June	Around Saddle Island.
	45	June	South of Cape Tormentine.
N.B.	63	Fall	Used to be high but now small in New Mills area.
	64-65	Spring & Fall	Spawning in Stonehaven to Grande Anse area used to be high, now reduced; mostly in Miscou - Pigeon Hill area in Fall.
	66	Fall	Spawning at Miscou but seems more extensive on south side of Island near Pigeon Hill.
	67	Fall (?)	Spawning in Ste Marie area.
	68	—	No spawning now; a little in spring four years ago and extensive spawning 12 years ago.
	70	Spring	4-5 years ago there was spawning in the Burnt Church area; now little; never spawn in Miramichi Bay.
	73	Spring & Fall	Spawn at Escuminac in both Spring and Fall; for 1977-78, spring spawning was more south; fall spawning was reduced.
	75	Spring & Fall	Spring spawning heavy at Point Sapin in spring 1978.
	76	Spring & Fall	Spring spawning reduced; fall spawning heavy in 1977; spawning is generally offshore in fall.

Table 27. Continued

Province	Statistical District	Spawning time	Comments
N.B.	77	Fall	Scattered reports of spawning off St. Edward-de-Kent; not fished due to lobster traps.
	78	15-25 May	Shediac area.
	80	Spring	Inshore; areas vary.
	82	June-July	Roseville.
	83	Spring	Drastically reduced at Cape Egmont.
	85	1st May	On sand at Rice Point.
	86	—	No spawning.
	87	—	No spawning.
	88	Spring & Fall	In Spring spawning at Naufrage and in Rollo Bay near Souris, in Fall near North Lake.
P.E.I.	92	Spring & Fall	In Spring (May) spawning at Miminegash, Scacow Pond, Skinner Pond Kildare and Alberton. In Fall spawning at Miminegash (reduced), Tignish & Skinner Pond.
	93	—	No spawning for 20 years.
	95	Spring & Fall	In spring (May-June), spawning at French River, North Rustico and outside Tracadie Bay. May also spawn in fall but not fished therefore uncertain.
	96	July	—

Table 28. Reports of the presence of juveniles during 1978-79 per statistical district as determined by the interview survey.

Province	District	Time of presence	Comments
N.S.	2	Spring	--
	3	Spring (May)	--
	13	Spring (May) & Fall	--
	11	Spring (May)	--
	46	Spring (May)	--
	45	Spring (May)	--
N.B.	63	Fall	6" herring seen inshore at New Mills.
	64-65	—	No observation.
	66	Fall	At Paspediac and Port Daniel.
	67	—	No observation.
	68	—	No observation.
	70	—	No observation.
	73	—	No observation.
	75	Summer	Eaten by birds.
	76	Fall	Seen at Richibucto in 1976.
	77	Fall	Seen locally.
	78	July-Aug.	Near Shediac.
	80	Fall	Large numbers of 6" herring near Bayfield in 1977.
P.E.I.	82	July	Seen offshore Alberton (July 21, 1978).
	83	—	No observation.
	85	—	No observation.

Table 28. Continued

Province	District	Time of presence	Comments
P.E.I.	86	—	No observation.
	87	June-July	In June 1978 there were a lot at Beach Point while in July there were a lot on Fishermen's Bank.
	88	June-July	Seen juveniles along shore from North Lake to East Point and from there to Murray Harbour; there are a lot at Souris as well; used to be seen in cod stomachs; rare now.
	92	—	No observation.
	93	July	Seen in mackerel catches.
	95	Fall	Used to be seen along shore; none now.
	96	—	No observation.

Table 29. Frequency of occurrence and percentage in the herring catch of associated species, per statistical district in Nova Scotia as determined by the interview survey.

Statistical District	Frequency of occurrence					Percentage in the catch			
	Macquerel	Gaspereau	Alewives	Cod	Squid	Macquerel	Gaspereau	Squid	Cod
2	8/8	3/8	1/8	1/8		17 (7)*	15 (2)	23 (1)	
3	14/14	6/14			2/14	31 (10)	14 (3)		
13	13/13	4/13		1/13	2/13	45 (11)	13 (1)		13 (1)
11	5/5					42 (5)			
46	3/3	3/3							
45	2/2					50 (1)			

* ( ) number of observations.

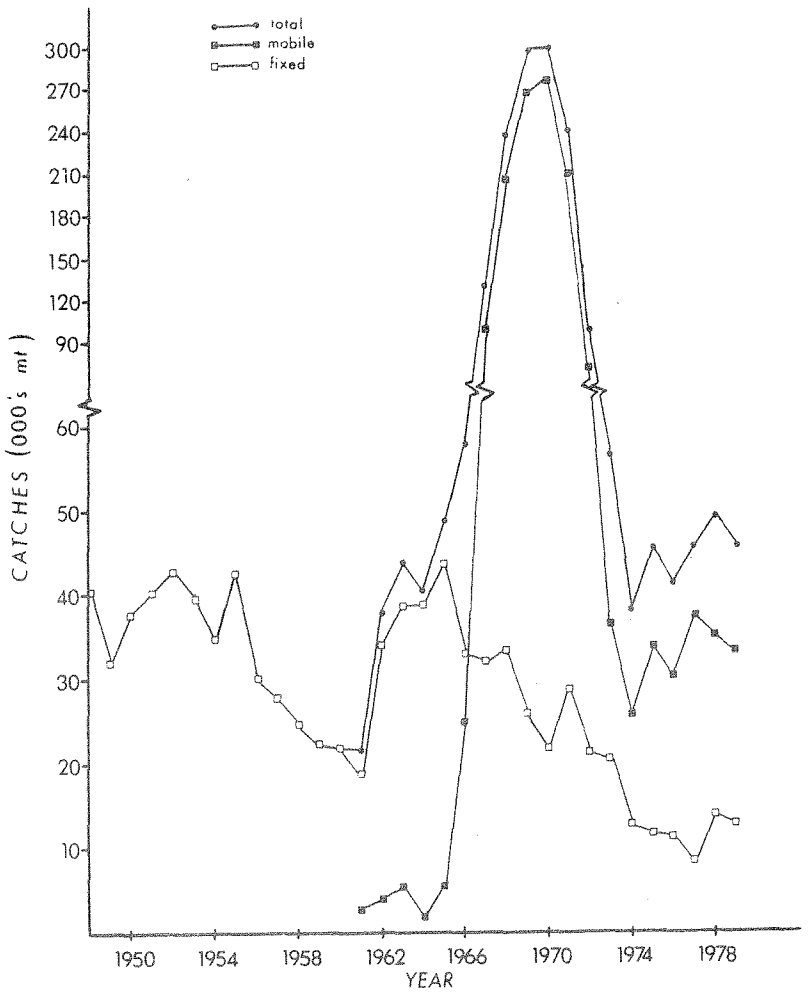

Fig. 1. Herring catches (metric tons) by gear for southern Gulf of St. Lawrence complex, 1948-1979. Note the change in scale for catches above 60,000 mt.

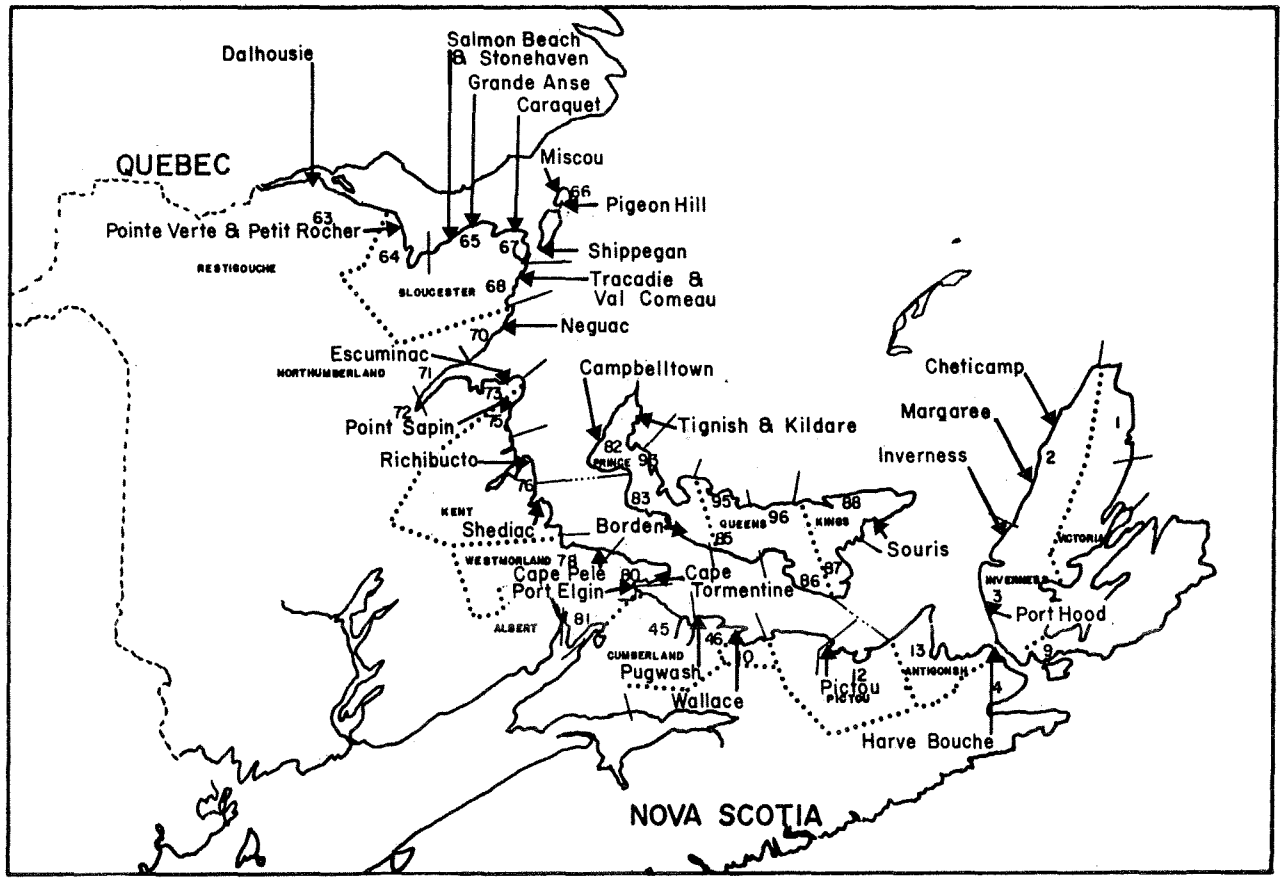

Fig. 2. Areas covered by the Southern Gulf of St. Lawrence herring gillnet fishery survey during summer 1978-79.

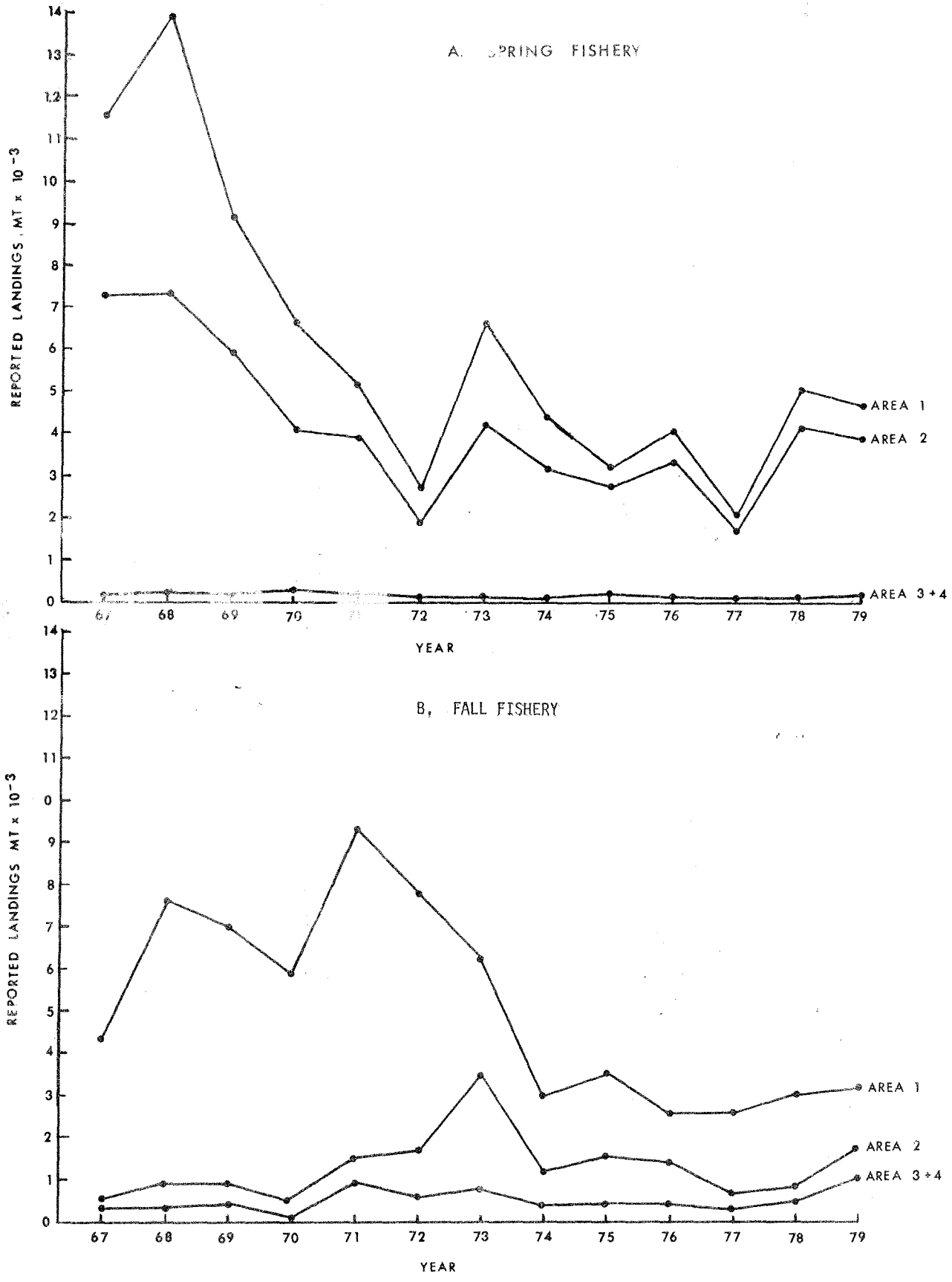

Fig. 3. Reported landings of herring in NAFO Division 4T by year, season and area.

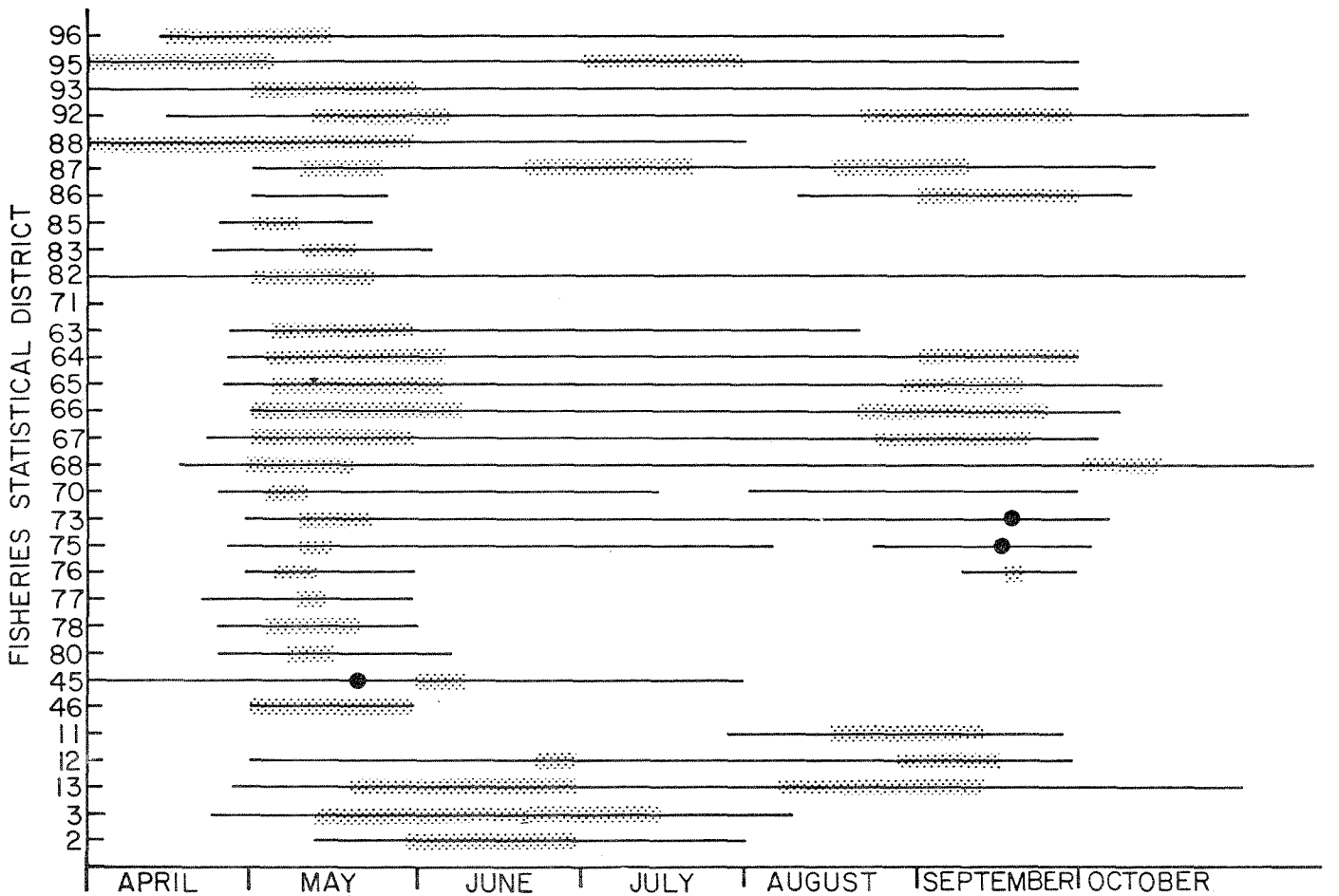

Fig. 4. Relationship between start and end dates of fishing season and time of peak fishing activity during 1979, as determined by the mail survey.

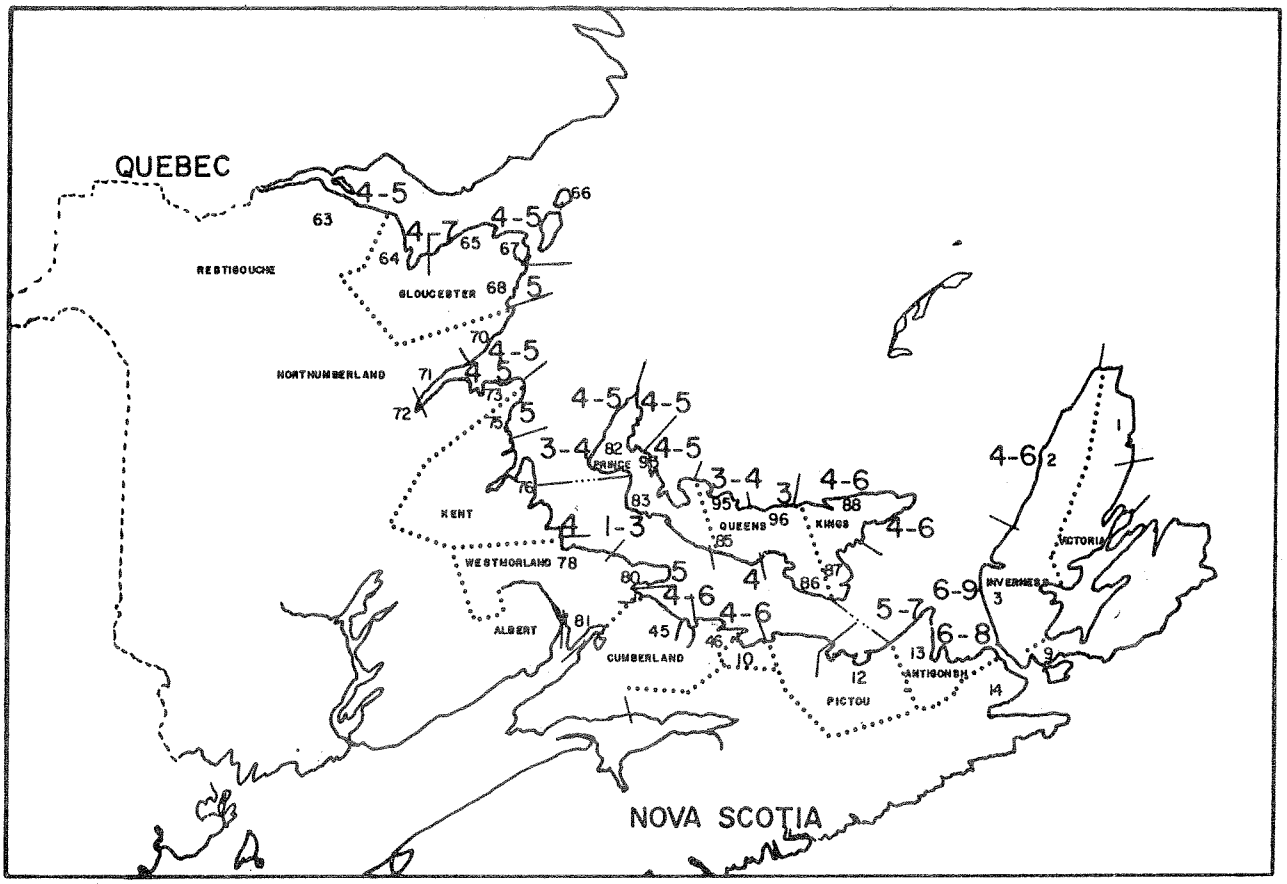

Fig. 5. Time of peak catch rates in spring (early summer), as determined by the interview survey. 1-2nd week April -- 4 - 1st week of May -- 8 - 1st week of June -- 12 - 1st week of July.

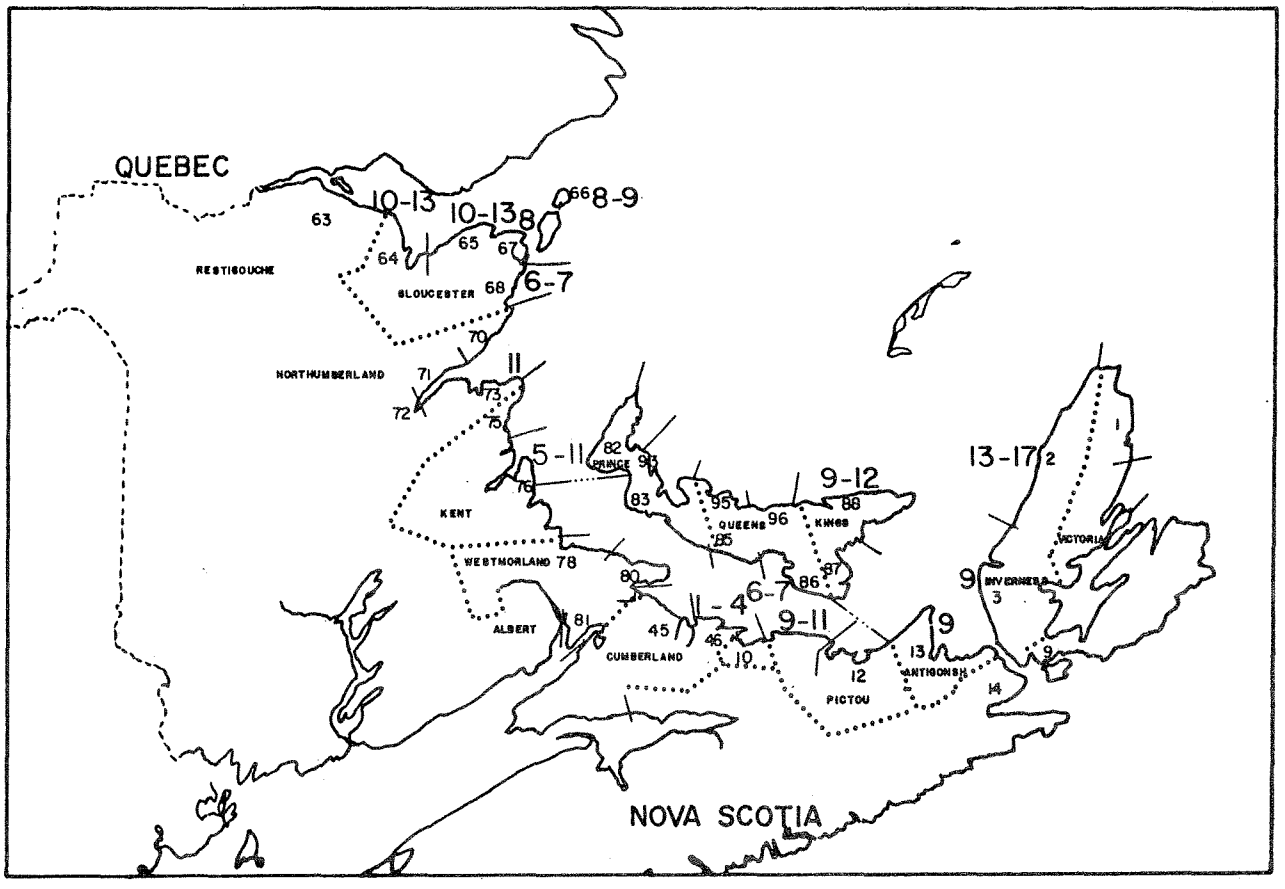

Fig. 6. Time of peak catch rates for herring during 4T fall herring fishery, as determined by the interview survey. 1 - 1st week of July -- 5 - 1st week of August -- 9 - 1st week of September -- 13 - 1st week of October -- 17 - 1st week of November.

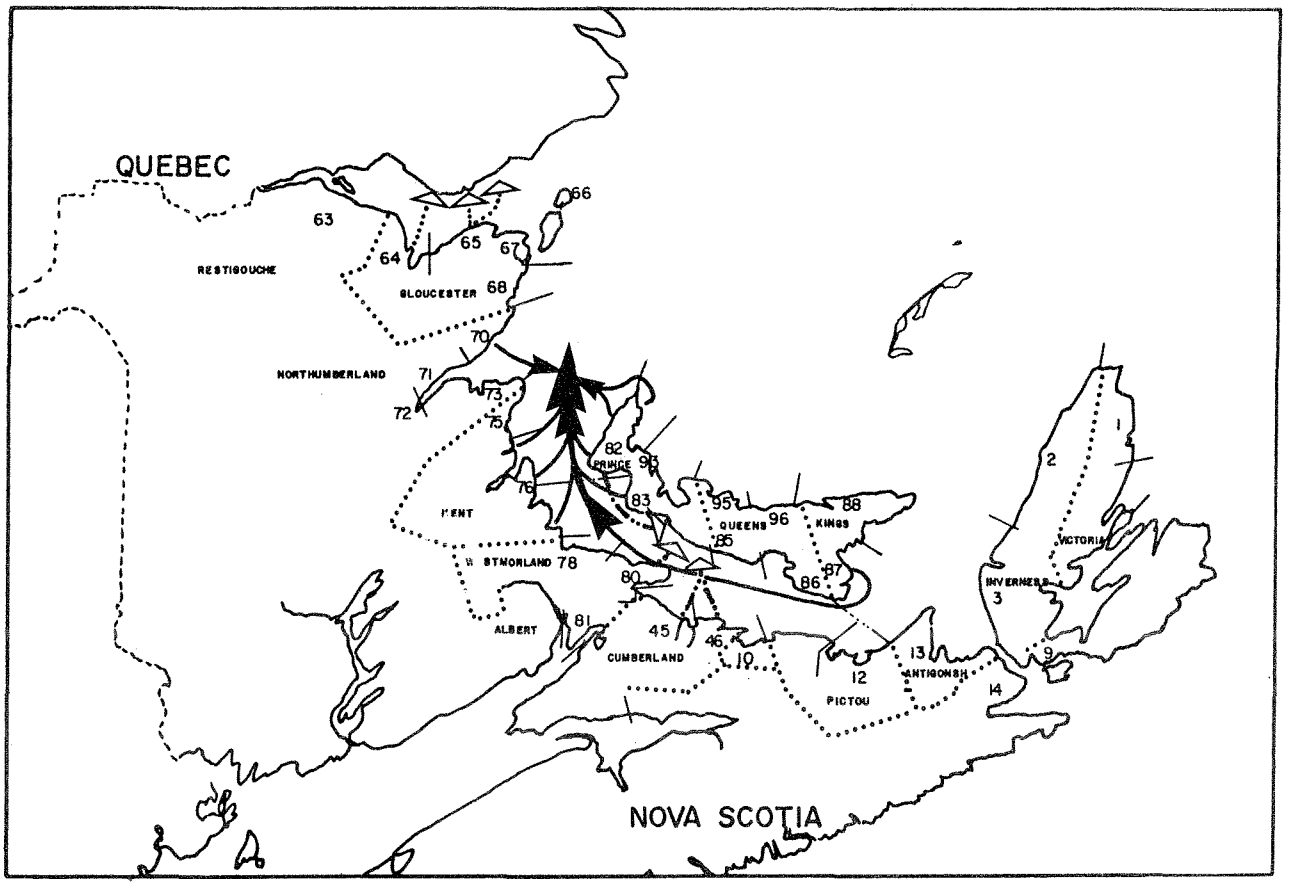

Fig. 7. Major movements of fishermen resident in the survey area during the 1970-79 spring fishing season, as determined by the interview survey.

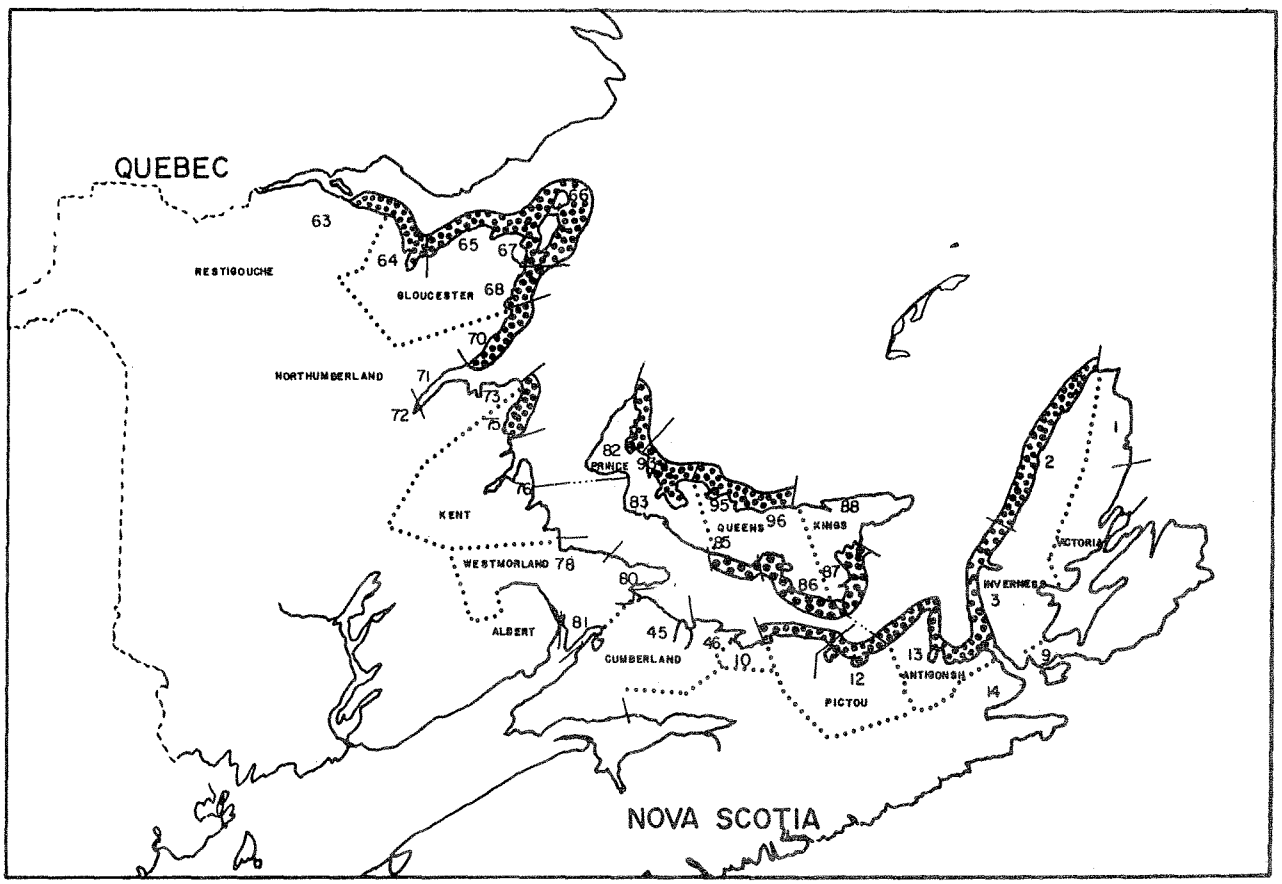

Fig. 8. Areas of herring fishing for lobster bait during the 1970-79 spring fishing seasons, as determined by the interview survey.

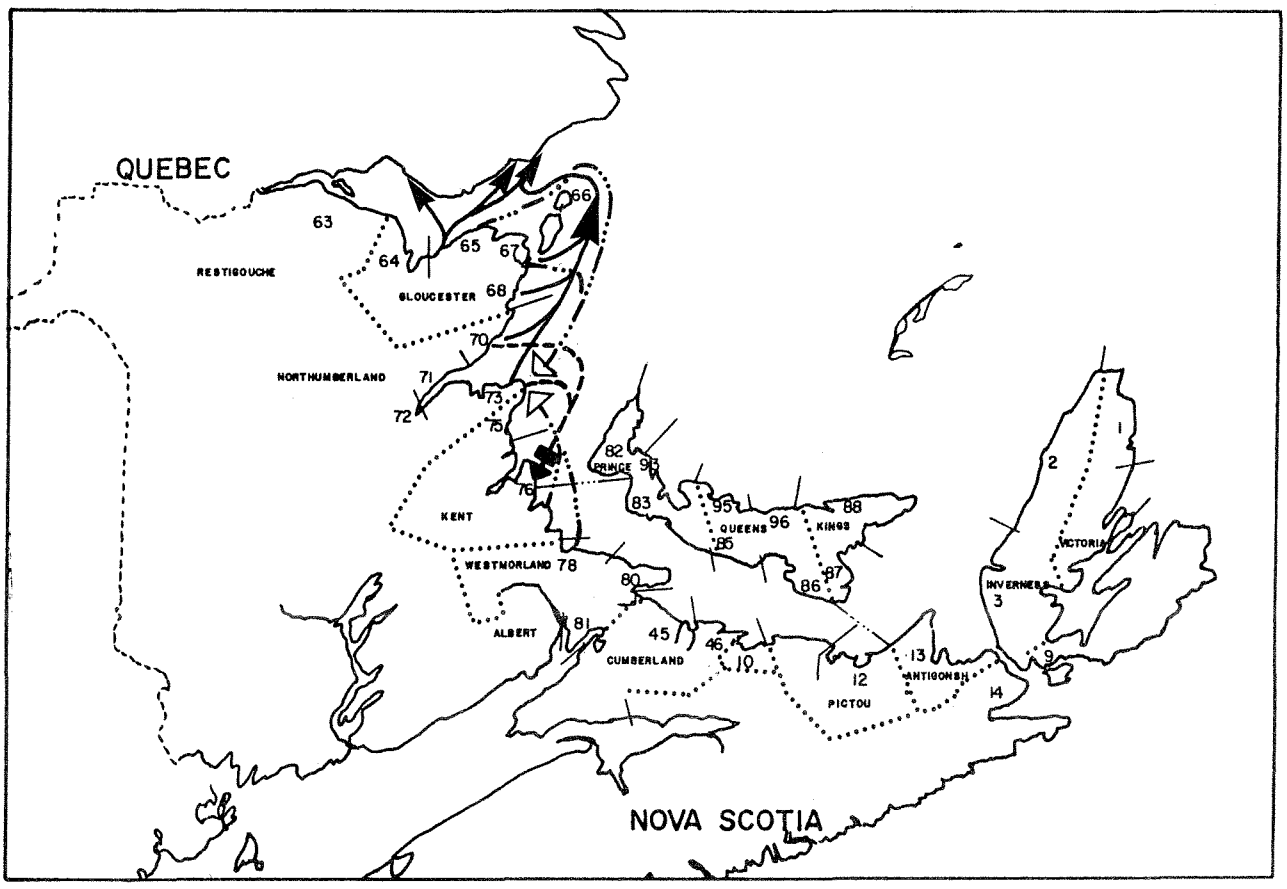

Fig. 9. Major movements of fishermen resident in the survey area during the 1970-79 fall fishing season, as determined by the interview survey.

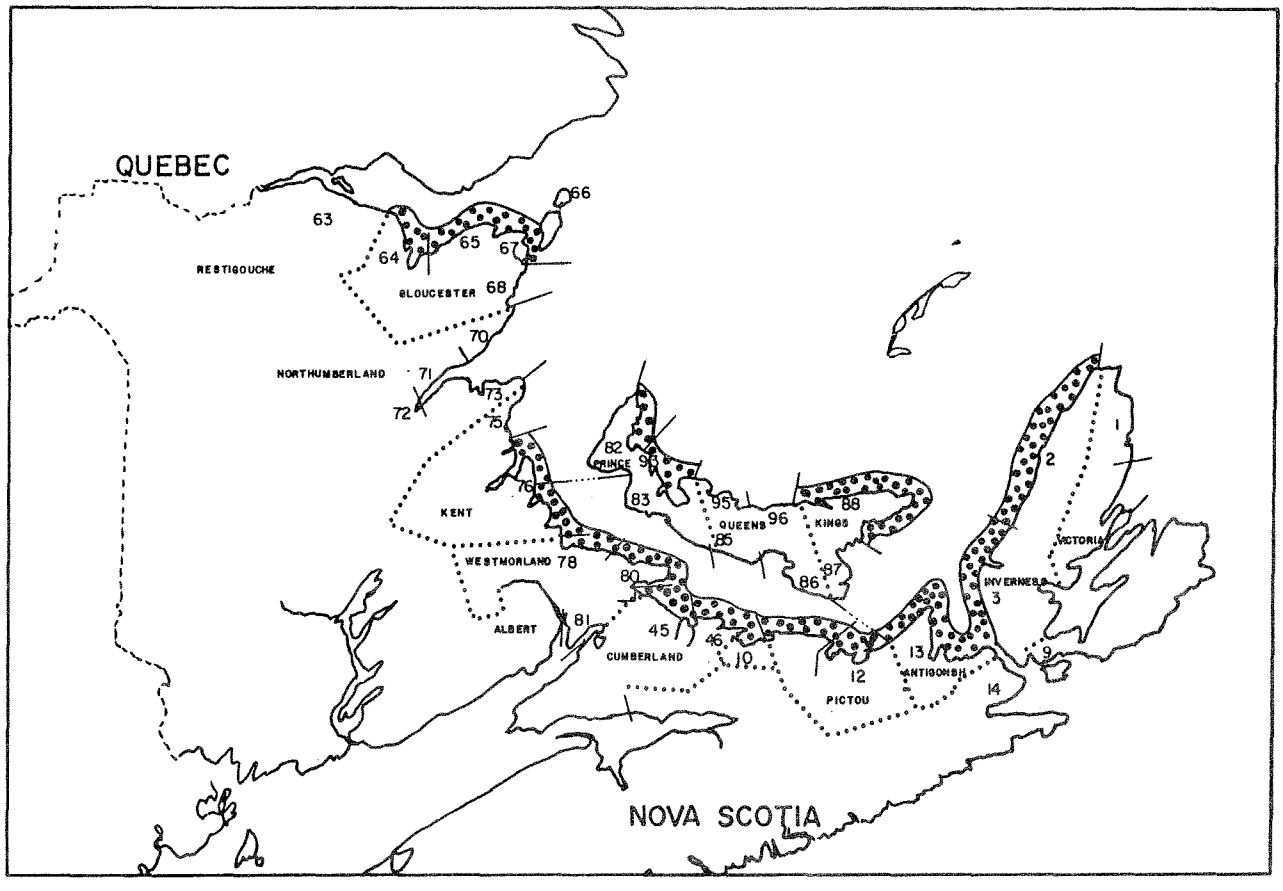

Fig. 10. Areas of mackerel fishing with herring by-catch during the 1970-79 fall fishing seasons, as determined by the interview survey.

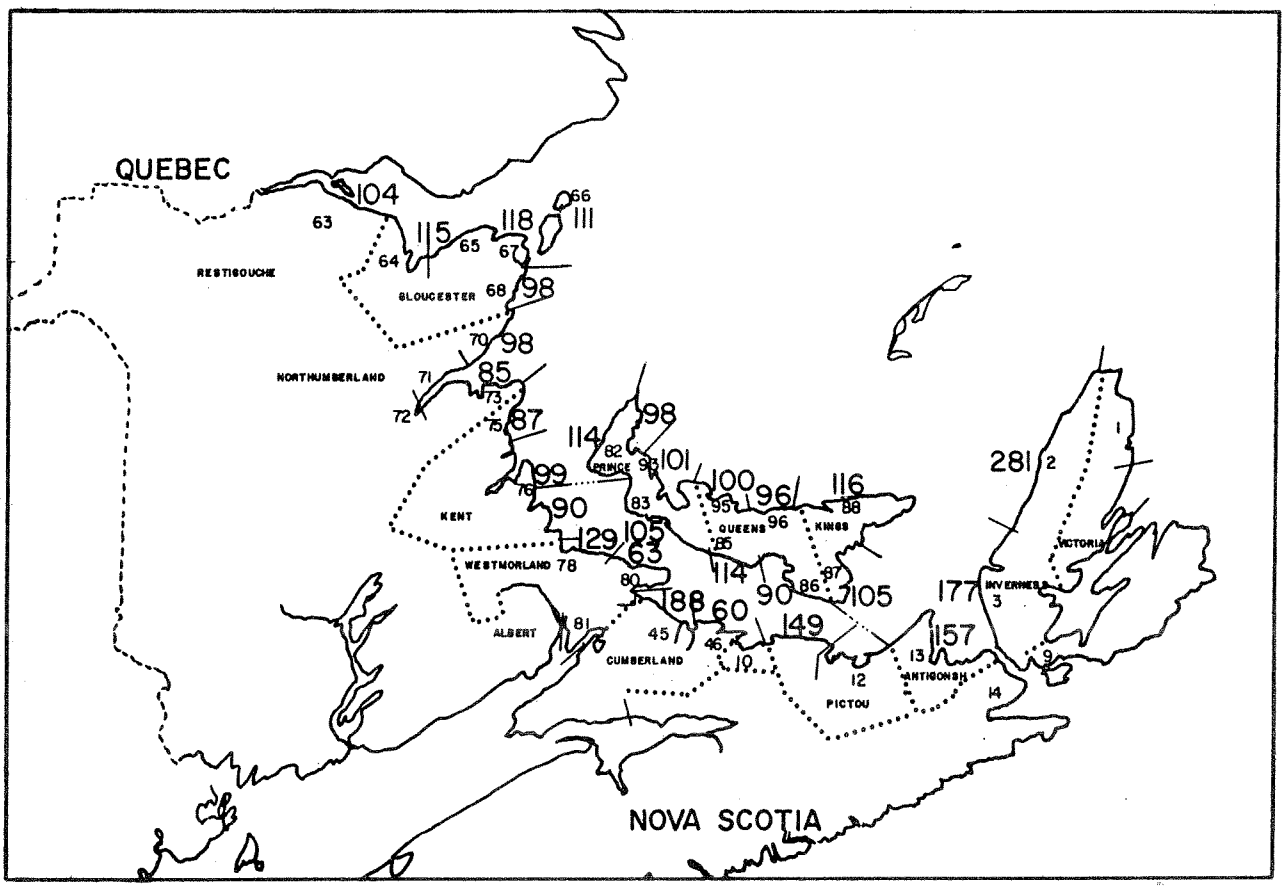

Fig. 11. Distribution of mean length (ft) of gillnets used by fishermen in the survey area during the spring and fall fisheries of 1978-79, as determined by the interview survey.

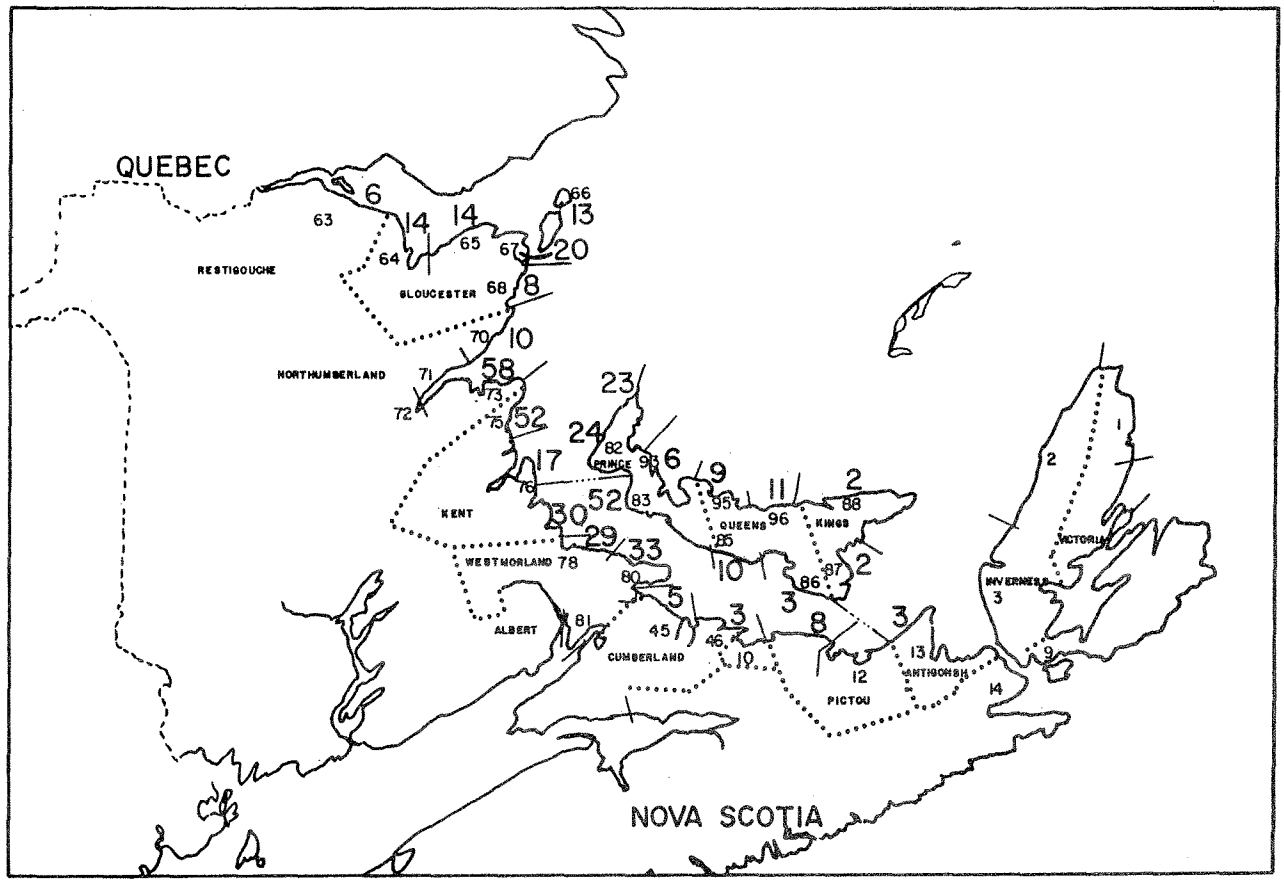

Fig. 12. Mean number of gillnets used by fishermen in the survey area during the spring fishery of 1970-79, as determined by the interview survey.

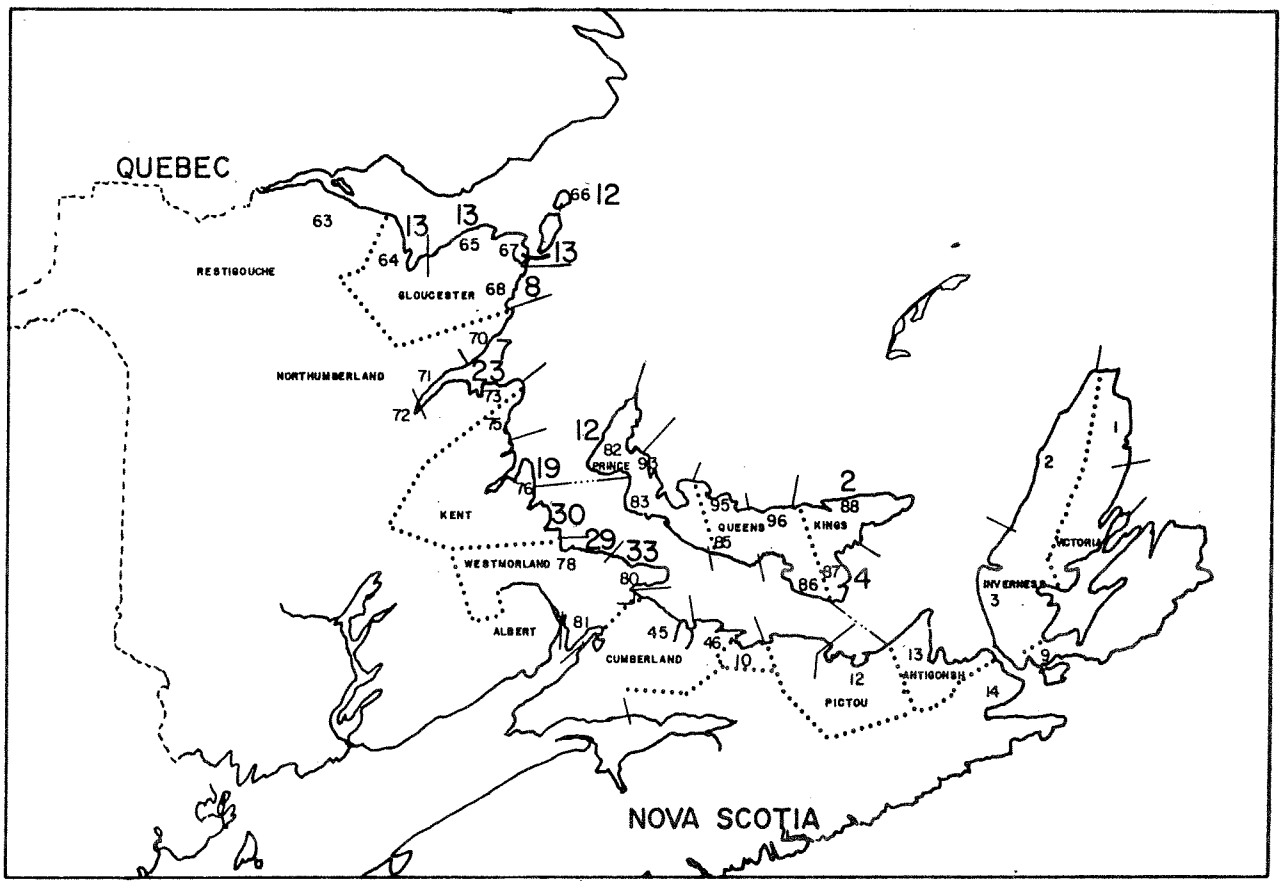

Fig. 13. Mean number of gillnets used by fishermen in the survey area during the fall fishery 1978-79, as determined by the interview survey.

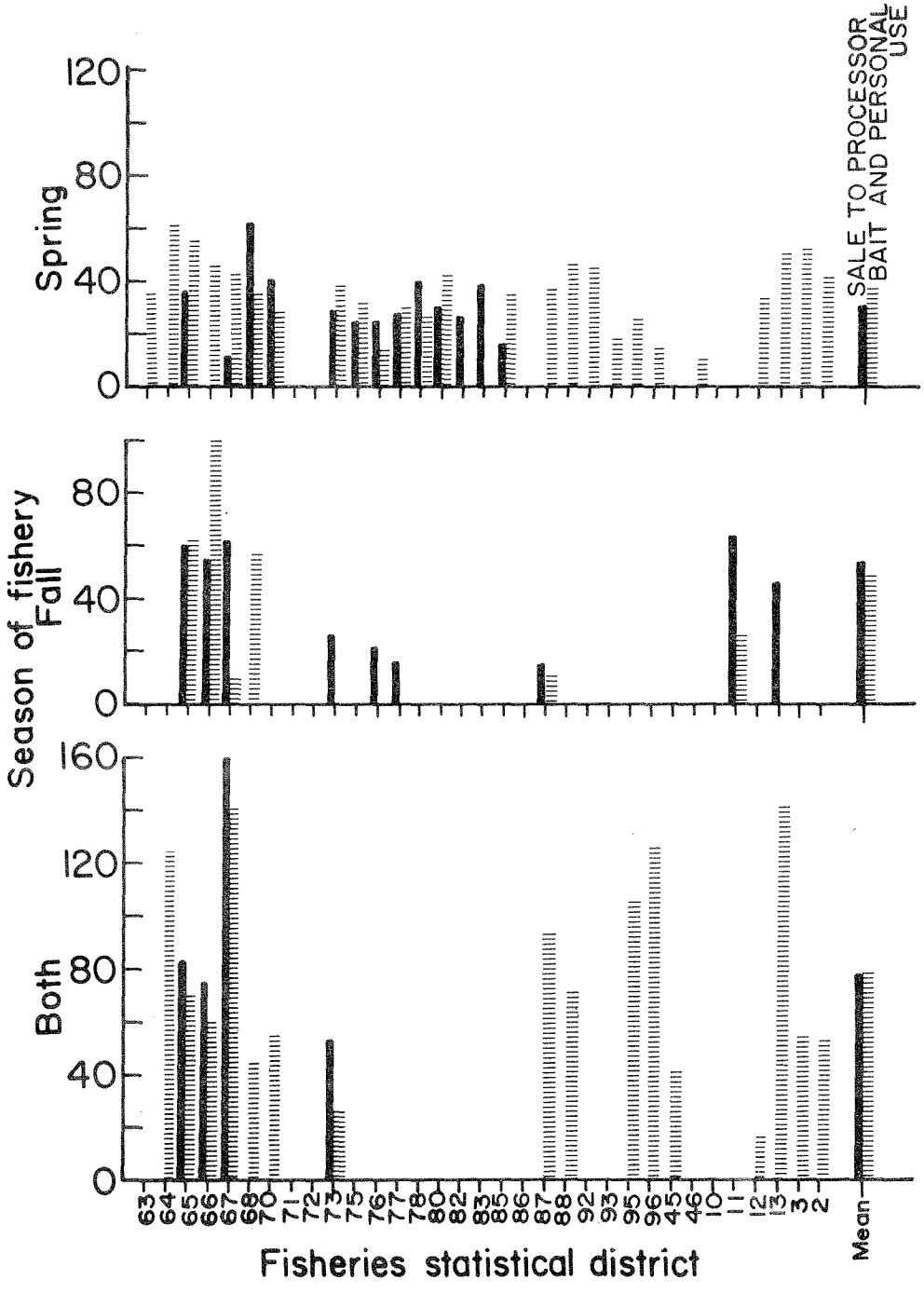

Fig. 14. Distribution of average number of days spent fishing during 1977-79 by season and catch processing type.

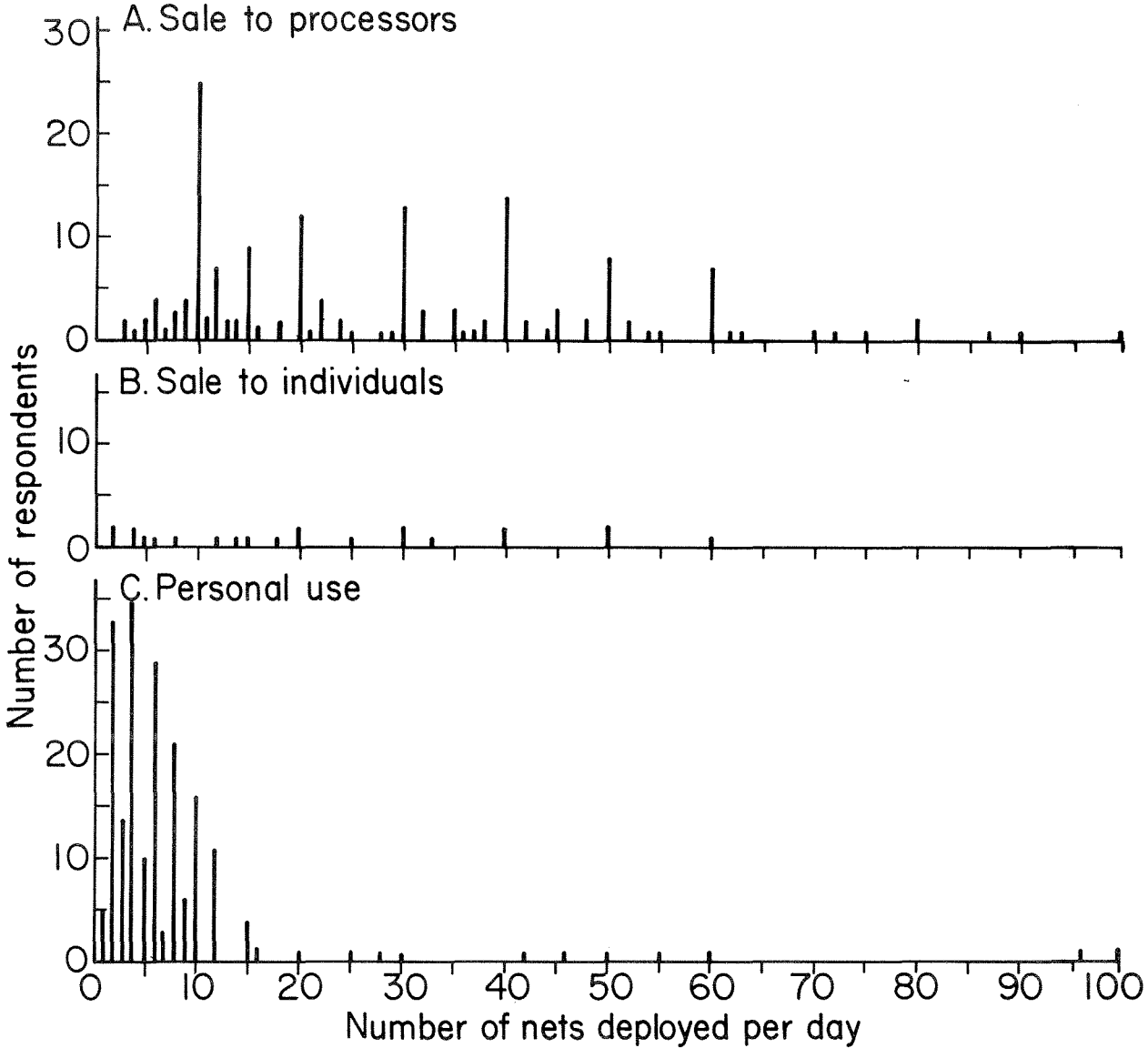

Fig. 15. Frequency distributions of number of nets deployed per day during 1979, as a function of use of the catch.

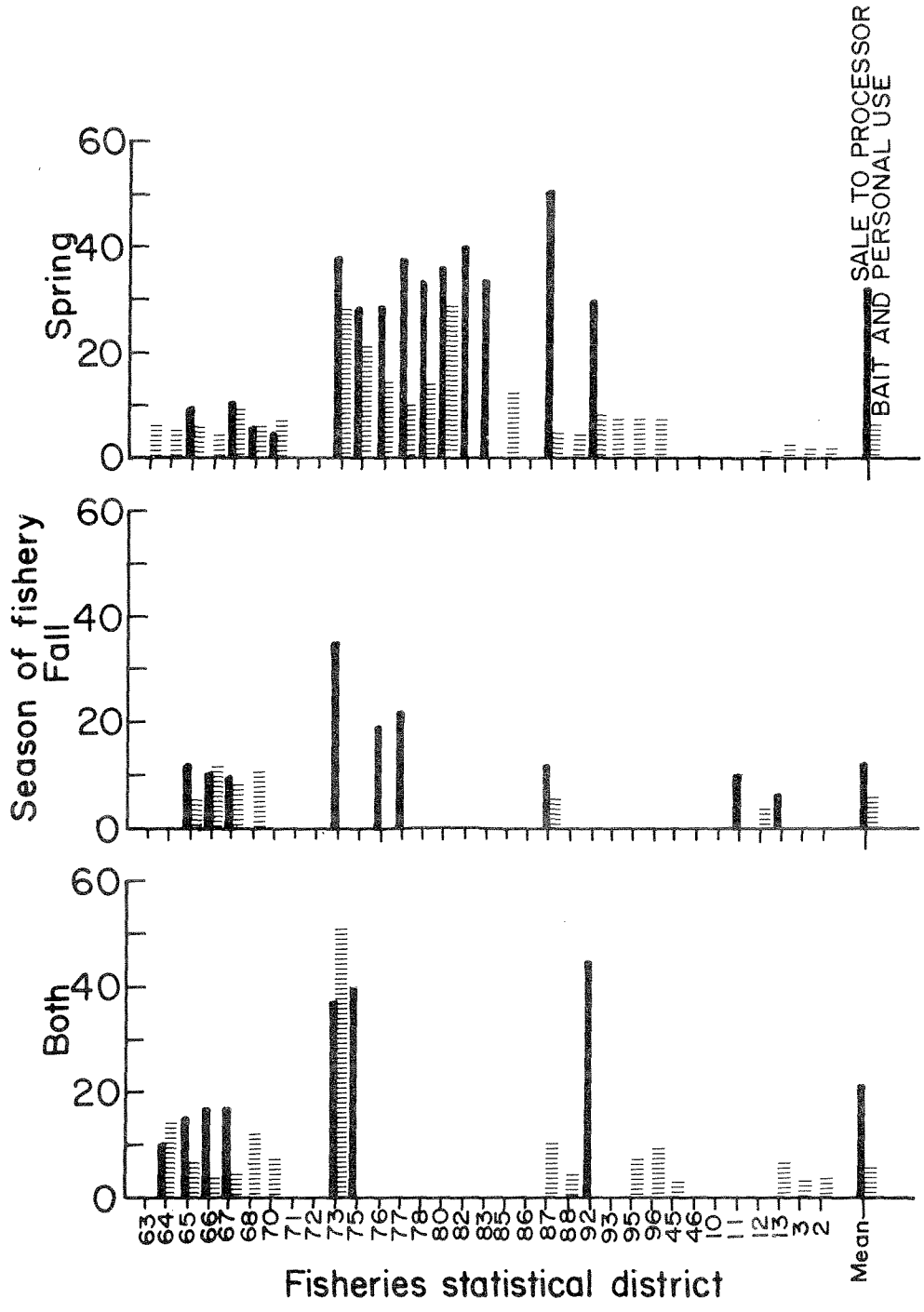

Fig. 16. Distribution of average number of nets deployed per day during 1977-70 by season and catch processing type.

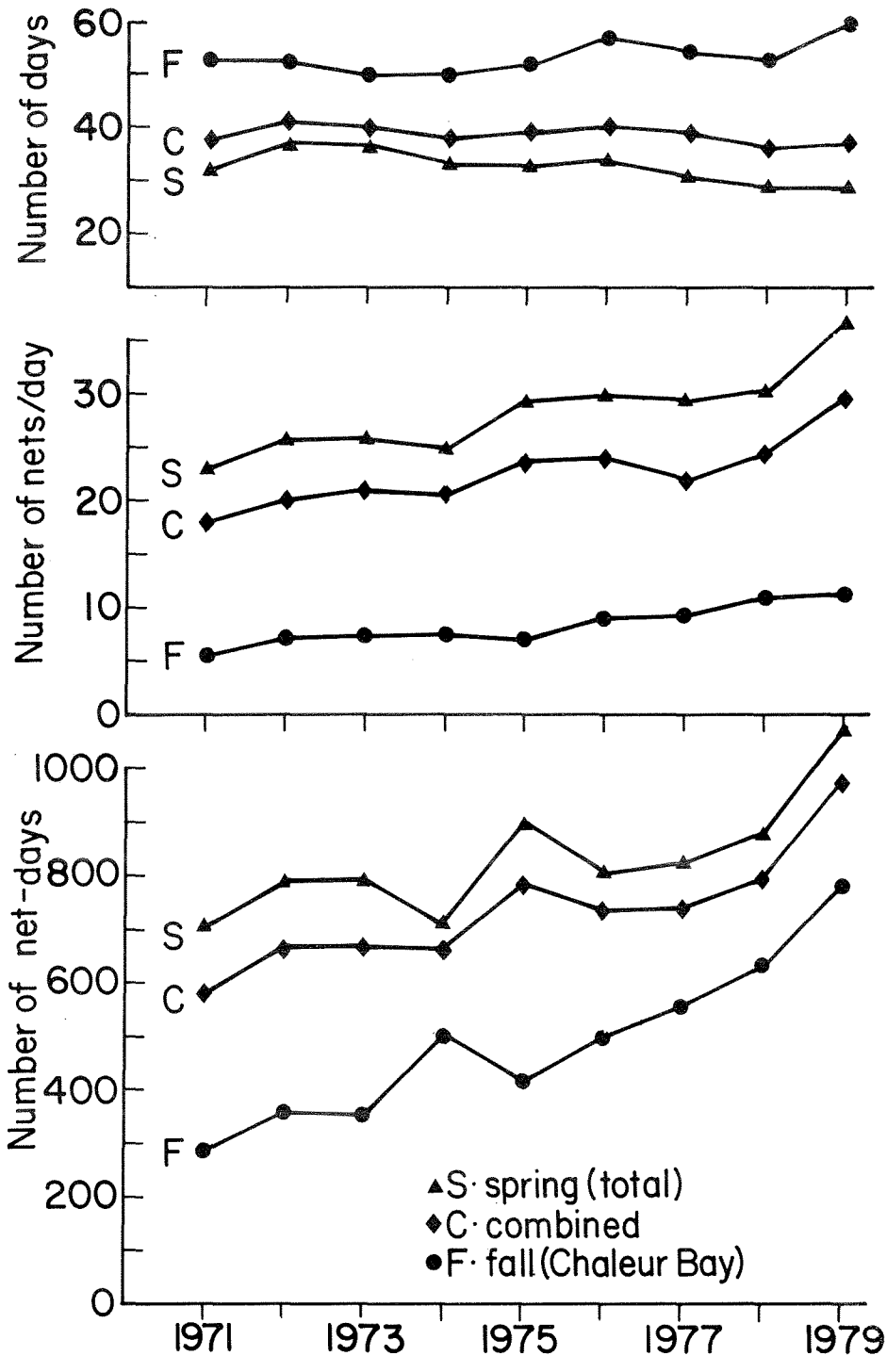

Fig. 17. Yearly changes in number of days spent fishing, number of nets set per day and number of net-days per fisherman (sale to processors only) during 1971-79.

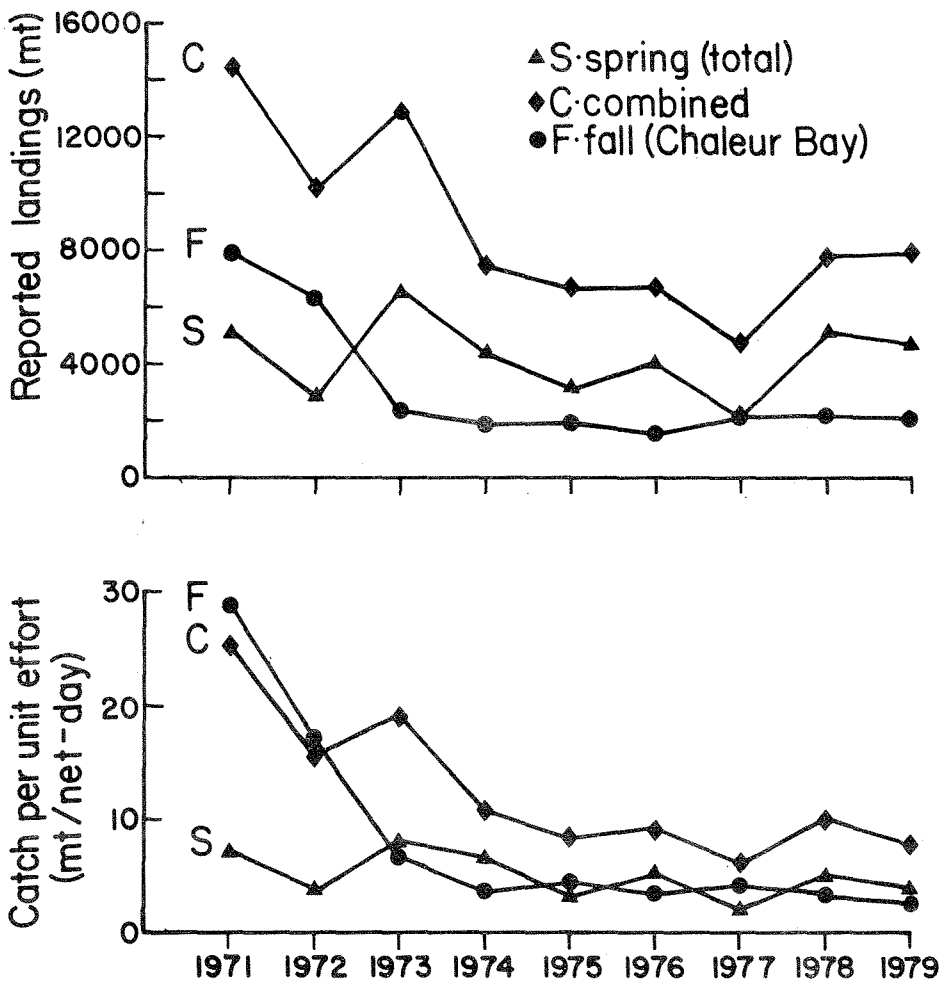

Fig. 18. Yearly changes in reported landings and calculated catch per unit effort during 1971-79.

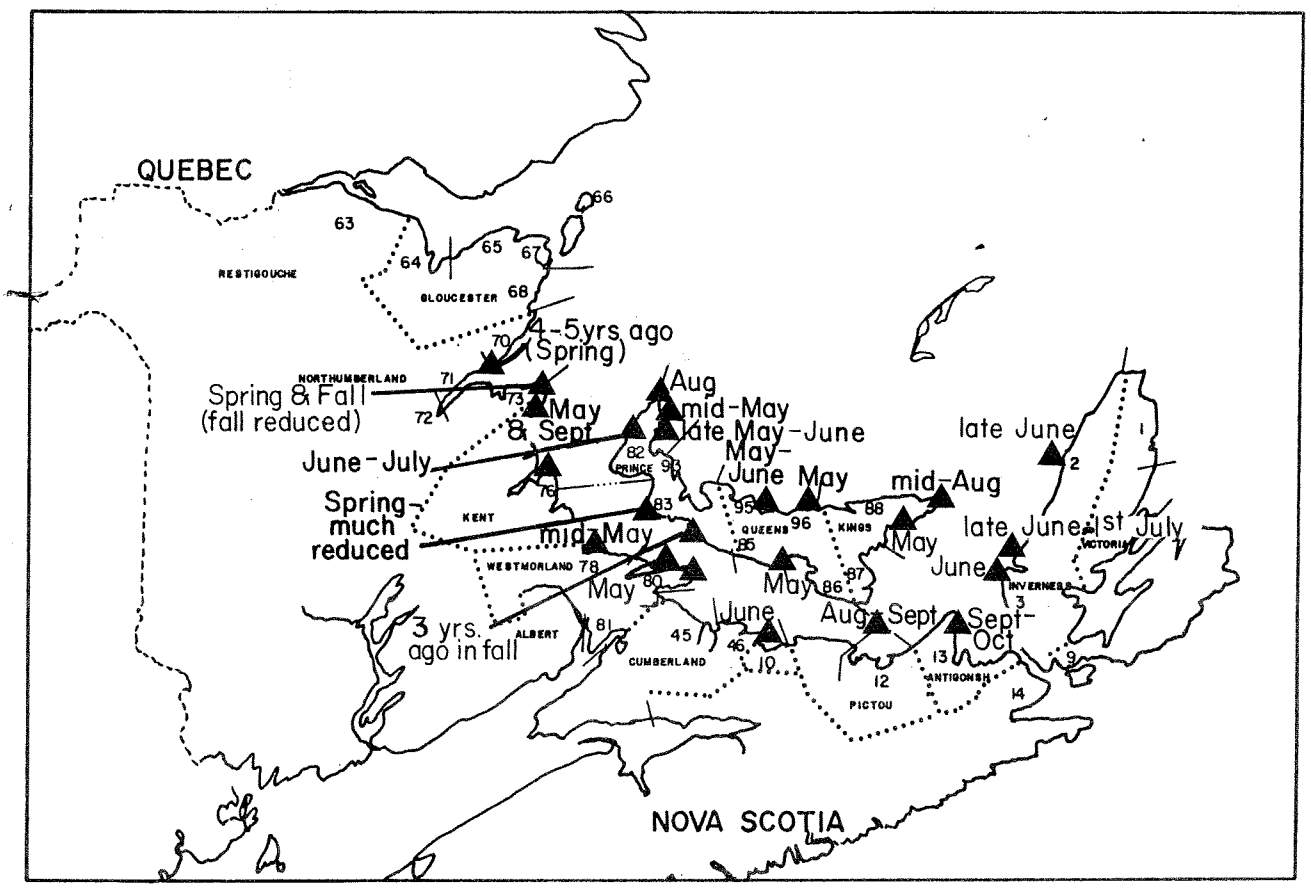

Fig. 19. Sites of major spawning activity in the study area, during 1978-79 as determined by the interview survey.

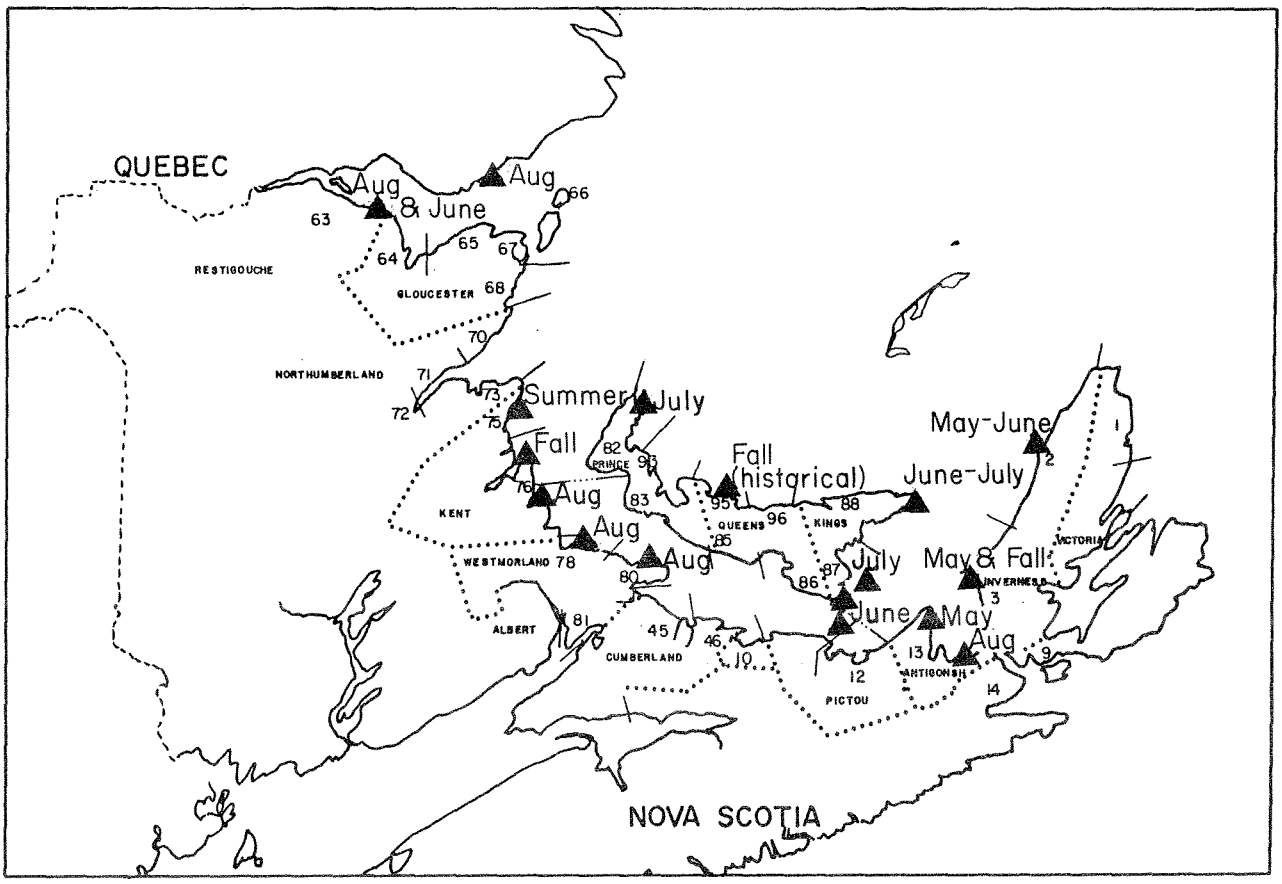

Fig. 20. Sites of major juvenile presence in the study area during 1978-79, as determined by the interview survey.

Appendix A

List of questions posed during interview survey in the southern Gulf of St. Lawrence (summer of 1978 and 1979)

FIXED GEAR QUESTIONNAIRE

Date_____ INTERVIEWER_____

NAME OF FISHERMAN: _____ PROV. FISHERIES DISTRICT _____

RESIDENCE_____

_____

FISHING GEAR

1. What type of gear does the fisherman employ?

   a) gillnets (set or drift)
   b) traps
   c) weirs
   d) others (specify)

2. Description and size of gear:

   a) Size of boat (if used):

      - length
      - tonnage
      - hold capacity
      - maximum time of storage possible
      - maximum possible time at sea
      - communication equipment (boat-to-boat and boat-to-shore)

   b) Size of nets

Year	Pre 1970	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979
# of nets											
length (ft)											
depth (ft)											
mesh size											

Specify any modifications

_____
_____
_____
_____
_____
_____
_____

UTILIZATION OF FISHING GEAR

3. In what area has he fished (generally and specifically - note on map). Has this changed substantially over the years?.

4. Indicate the importance of the following criteria for the fisherman in the choice of fishing location:

   0 - not considered

1 - not very important
2 -
3 -
4 - very important
5 - only criterium

	IMPORTANCE					
Tide	0	1	2	3	4	5
Currents	0	1	2	3	4	5
Bottom Type	0	1	2	3	4	5
Temperature	0	1	2	3	4	5
Presence of other species	0	1	2	3	4	5
Time	0	1	2	3	4	5
Migration of fish	0	1	2	3	4	5
Experience in the area	0	1	2	3	4	5
Winds (weather)	0	1	2	3	4	5
Other (specifically)	0	1	2	3	4	5

Give details on most critical factor.

5. Have these criteria changed over time or remained the same?

6. How does the fishermen locate the fish? Is there generally co-operation between fishermen?

7. a) Does the fisherman feel that his skill in locating and catching fish has changed with time?

   b) If yes, does the increase in skill coincide with changes in technology (e.g. acquistion of new equipment [sonar, etc.]).

   - or increased co-operation between fishermen
   - or increased knowledge of herring distribution
   - or a combination of the above.

8. Description of effort (seasonal)

In what time of year is fishing most intensive?

Spring	Pre 1970	1970	1971	1973	1974	1975	1976	1977	1978	1979
Start and end date										
# of days fishing										
% of season fished										
Time of max catch rate										

Fall	Pre 1970	1970	1971	1972	1973	1974	1975	1977	1978	1979
Start and end date										
# of days fishing										
% of season fished										
time of max catch rate										

9. Description of daily effort

   a) Is daily effort the same for spring and fall?
   b) What is your definition of a set?
   c)

	Pre 1970	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979
# of nets per set											
Time/set											
Sets/day											

10. How does the market affect

    a) fishing season
    b) fishing area
    c) fishing gear
    d) discarding

11. What percentage (by weight) of your fish is:

    a) sold to processors
    b) sold to private individuals
    c) kept for personal use

12. Has the number of herring fishermen in the area remained relatively constant over the years or has it changed? If so specify.

CHARACTERISTICS OF FISH POPULATION

13. How does the size of fish caught change over:

    a) season
    b) years

14. Do you discard? If so, why and how much?

15. In what areas and periods of the year do you find:

    a) juveniles
    b) adults
    c) spawners

    Specify details on abundance, fish sizes, and duration of stay whenever possible, and any behavorial changes.

16. What other fish and invertebrate species are associated with your catches of herring? What are the relative percentages of these?

Appendix B

Mail survey questionnaire (English version) used during summer 1979. 4T Herring Gillnet Fishery Survey.

DATE _____ RESIDENT AREA _____

NAME _____ AREA WHERE FISH LANDED _____
(optional)

1. Do you fish herring primarily. (if not fishing herring, please drop envelope in mail).

   a) for sale to a processor
   b) for sale to private individuals
   c) for your own personal use (bait, consumption).

2. Please indicate the percentage of your fishing time spent herring fishing.

   Less than 10% 25% 50% 75% 100%

3. How many years have you been fishing herring? _____

4. In what time of the year is fishing most intensive?

5. What is your definition of a set?

This part of the survey is designed to try and get some idea of how your fishing effort has changed over the years. We would hope for at least 1979 information, but would appreciate any historical data that you can remember.

Please try and fill in as much of the following table as you can.

Row 2: Number of days nets were in the water actually fishing each year (estimate).

Row 3: Estimate the percentage of the total herring fishing season that you think you fished that particular year. Fill in this row particularly if you can't remember the number of days in Row 2.

Row 4: Indicate, if possible, the time during the fishing season when catch rate was maximum.

Row 6: Estimate in hours, the average time each set was in the water. (i.e., all day, overnight, etc.)

Row 5, 6, 7: Only includes the nets you actually had in the water fishing each season.

ROW	YEAR	1979	1978	1977	1976	1975	1974	1973	1972	1971
1	Start & End Dates of Season									
2	# of days fishing									
3	% of fishing season									
4	Time of maximum catch rate									
5	# of nets/set									
6	time/set									
7	#set/day									

PLEASE RETURN THE QUESTIONNAIRE AS COMPLETE AS POSSIBLE IN THE STAMPED SELF-ADDRESSED ENVELOPE PROVIDED.

(ATTACHED LETTER ON BACK)

Appendix C

Mail survey questionnaire (French version) used during summer 1979 - 4T Herring Gillnet Fishery Survey.

DATE _____ DOMICILE _____

NOM _____ PORT DE DEBARQUEMENT DU POISSON _____
(Non obligatoire)

1. Dans quel but principal pêchez-vous le hareng? (si vous ne pêchez pas le hareng retournez-nous l'enveloppe affranchie).

   a) pour vendre à des "empaqueteurs"
   b) pour vendre à des particuliers
   c) pour votre usage personnel (appât, consommation-nourriture etc)

2a. Au cours d'une année, de tout votre temps passé à la pêche, quel pourcentage avez-vous consacré à pêcher le hareng?

   moins de 10% 25% 50% 75% 100%

b. Quelles autres espèces pêchez-vous le reste du temps?

3. Depuis combien d'années pêchez-vous le hareng?

4. Durant quel(s) mois de l'année la pêche au hareng est-elle la plus intensive? (i.e. durant quel(s) mois fournissez-vous le plus gros effort de pêche (precisez les dates, si possible).

5. Lorsque vous pêchez, utilisez-vous vos filets maillants (Gillnets)
   ___ en groupes
   ___ séparément

La partie suivante du questionnaire est destinée à nous faire connaître tout changement survenu dans l'effort de pêche au hareng au cours des dernières anneés. Commencez par donner l'information pour 1979, puis remplissez le reste du tableau au meilleur de votre connaissance.

Explications du tableau:

Ligne 2: Nombre de jours pendant lesquels vos filets etaient à l'eau pour pêcher le hareng (et non pas d'autres espèces)?

Ligne 3: Considérant exclusivement la saison de pêche au hareng, quel pourcentage de cette saison avez-vous personnellement passé à pêcher le hareng? (votre réponse est ici très importante si vous ne pouvez pas remplir la ligne 2 du tableau)?

Ligne 4: Donnez, si possible, la (les) date(s) pour laquelle (lesquelles) le taux de capture de hareng est maximum.

Ligne 5: Nombre de filets maillants utilisés pour le hareng pendant une journée (Donnez une valeur moyenne pour la saison ex: 4 filets/jour).

Anné	1979	1978	1977	1976	1975	1974	1973	1972	1971
1. Dates début et fin de la saison de pêche									
2. Nombre de jours à pêcher									
3. % de la saison de pêcher									
4. Date du taux maximum de capture									
5. Nombre de filet/ jour									

Retournez-nous le questionnaire rempli dans l'enveloppe adressée à Marine Fish Division. Le tarif postal étant déjà payé, il est inutile d'apposer un timbre à l'enveloppe.

Appendix D

Comments made by fishermen during interview survey

The following pages contain comments made by fishermen during the course of interviews held in New Brunswick and Prince Edward Island. Although many of the these comments have been considered in the main body of this document, some were not. Thus it was felt of value to present these individual comments on a port by port basis. In each area the comments are categorized by the following:

1) Where - this refers to the area where the fishermen stated that fishing activity occurred .

2) When - this refers to when the fishing activity was stated to have occurred.

3) How - this section contains comments on the type of gear and fishing operations that are used in the area.

4) Recent catches - in this section are found comments on the fisherman's relative fishing success in the years both during and just before the survey.

5) Mackerel - The mackerel fishery has a considerable influence on the fall herring fishery. Thus a separate section was reserved for comments on this fishery.

6) Misc. - this section presents comments other than those given above.

Note that these comments in no way reflect the opinions of the government, only those of the interviewed fishermen.

Statistical District 63

Port: Dalhousie and New Mills

Comments:

Where: Fishing occurs only in local shore areas for lobster bait.

When: This area has only a spring fishery which starts as soon as the ice is out and ends around the end of May.

How: Gillnets set by hand.

Recent catches: Most fishermen were able to catch their desired amount of bait for the 1978 fishing season.

Misc.: There used to be a fall fishery in the bay but local fishermen claim that purse seiners caused its demise 7-8 years ago.

As the markets are not well developed in the area, fishermen state that they would not be able to sell large amounts of herring even if they caught them.

Mackerel: Mackerel catches in the bay have been very low in the last 3-4 years, particularly in 1978.

Statistical District 64

Port: Petit-Rocher and Pointe-Verte

Comments:

Where: In the spring, herring is caught locally for lobster bait.

In the summer, herring is caught locally as by-catch to the mackerel drift net fishery.

In the fall, large boats fish for herring on the Quebec side of the bay.

When: The spring bait fishery starts in the last week of April and carries on until end of June. The fall fishery off Quebec occurs during September and October.

How: Set gillnets in spring and fall. Drift gill nets in summer.

Recent catches: Most fishermen reported good catches in the spring of 1978. A new market is being built and more fishermen are predicted to enter the fishery in 1979.

Misc.: The primary fishery in this area is for lobster. When the lobster season is over, the fishermen will direct their efforts on herring, cod, scallops or even tuna.

Statistical District 64 and 65

Port: Grande-Anse, Stonehaven and Salmon Beach

Comments:

Where: In the spring, local fishing off wharves for lobster bait. Few fishermen travel to Quebec shore to fish in fall.

When: Exclusively in spring.

How: Hand-deployed gillnets from small boats.

Recent catches: Catches have declined in last two years; most fishermen with big boats have sold them.

Misc.: The fishery in this area is unpredictable. One never knows what to expect from one year to the next. Many fishermen have entered the local tourist trade, particularly at Grande-Anse, to make money.

Some fishermen stated that the herring can be found further offshore. Local fishermen stated that 7-8 years ago, purse seiners fished in 13 fathoms of water and that their activity destroyed the fishery.

Statistical District 65

Port: Blue Cove

Comments:

Where: In the spring, local fishing for lobster bait from Caraquet to Miscou Point. In the fall, most fishing carried out on the Quebec side of the bay with some down at Escuminac.

When: In spring, from ice breakup to end of May.

In fall, from end of July to end of October - mid November.

How: Most fishermen in the area have only small boats for bait fishing. Two fishermen have large boats which enter the fall fishery.

Recent catches: The spring 1977 catches were good but poor in 1978.

Misc.: As local catches are poor, boats must be able to travel in order to make any money. This situation has existed for the last ten years. The local fishermen claim that the purse seiners destroyed the fishery.

Statistical District 65

Port: Caraquet*

Comments:

Where: Spring fishing occurs locally from Caraquet to Miscou Island.

In the fall, fishing first occurs in August on the Quebec side of the bay, then shifts to the Miscou area in September. No fishermen from this port go farther up the bay to fish.

When: In the spring, from ice breakup to the end of May.

In the fall, from beginning of August to the end of September.

How: In this area, most of the fishermen have large boats equipped with hydraulic rollers. Very little bait fishing occurs. With few exceptions, these boats must search for herring.

Recent catches: There has not been good catches on the N.B. side of the Bay for the last seven years.

In the fall, the best catches are reported from the Miscou area. In the fall of 1977, good fishing was also experienced on the Quebec side in the fall.

Misc.: Fishermen were very vocal about the effect of purse seiners in the fishery. They blamed the decline in herring catch rates on over fishing by these boats.

*Most of the interviews were conducted with the aid of a french translator. Consequently, information may have been lost during the interview process.

Statistical District 66

Port: Miscou Centre

Comments:

Where: In the spring, locally.

In the fall, on the Quebec side (Paspediac to Port-Daniel) and in the Miscou Island area.

When: In the spring, from ice breakup to end of May. In the fall, from 25 July to end of September.

How: Most fishermen have small boats equipped with hand-deployed gillnets. The storage capacity of these boats is limited and thus they cannot travel for some fishermen have large boats with big nets and hydraulic rollers for deployment.

Recent catches: Most claim that the spring lobster bait fishery is almost dead; however, in spring 1978, many fishermen caught enough lobster bait in the area which does not normally occur.

Misc.: Herring are no longer found in any great quantity in the Bay; they seem to be congregated on the south side of Miscou Island; and elsewhere in the area, overfishing by the purse seiners was blamed for the depletion of herring in the bay.

In the fall of 1977, one fisherman noticed large amounts of small herring at Paspebiac in the fall; felt that this indicated good fishing in the future.

Statistical Districts 66 and 67

Port: Pigeon Hill, Ste.-Marie-sur-Mer, Le Goulet and Shippagan

Comments:

Where: In spring local bait fishery.

In fall, local bait fishing as well as herring fishing by large boats off Quebec and Miscou Island.

When: In spring, from ice breakup to end of May.

In fall, if the weather is good, from end of July to mid-October. If not, from mid-August to end of September.

How: Most fishermen have small boats with hand-deployed gillnets. These are restricted in their mobility due to small storage capacities. The larger boats with larger nets and hydraulic rollers can move around much more.

Recent catches: Generally, catches in the fall fishery are higher than in the spring fishery. In Pigeon Hill and Le Goulet, local fishing is bad in both spring and fall. One fishermen stated that he caught about 50 barrels in the fall of 1977 and only about 3 barrels in the spring of 1978.

Some fishermen stated that there was an early run of fall fish in June of 1978 and many anticipated good catches in the Miscou area that fall.

Misc.: Locally, fishing is very bad except for lobsters. Indeed, lobster poaching is common on account of the need for income.

Most fishermen are trying to get into bigger boats and heavier equipment to allow mobility to other areas.

Statistical District 68

Port: Tracadie and Val Comeau

Comments:

Where: In spring, local lobster bait fishery.

In fall, a few large boat fishermen go just about anywhere for herring. These fishermen are in the lobster fishery in spring.

When: In spring, from ice breakup to end of May.

In fall, during August and September. Also the odd herring caught during summer mackerel fishery.

How: Local fishermen use small boats with hand deployed set gillnets.

The large boats use hydraulic rollers. Drift netting is used in the mackerel fishery.

Recent catches: Fishermen haven't seen any improvement in catch rates in the area.

Only see a few fish in the fall.

Misc.: Generally very little herring fishing in this area; effort is more directed on cod, scallops and mackerel.

Fishermen claim that there were lots of herring in the area twelve years ago. They state that before the Canso Causeway was built, the herring used to move through the Northumberland Strait and hit the New Brunswick shore. Now they feel that the fish move north of P.E.I. and consequently hit the Quebec side of Chaleur Bay.

Statistical District 70

Port: Tabusintac

Comments:

Where: Most fishermen fish locally for lobster bait in spring. Only one large boat fishermen goes to Quebec and Miscou in the fall.

When: In spring, from ice breakage to end of May.

In fall, from beginning of May to end of November.

How: Same as in districts 66, 67 and 68.

Recent catches: The best catches occur in the area in which ice breakup first occurs. Recent catches have been low.

Misc.: There was good fall fishing in Tabusintac lagoon about three years ago.

There were good fall fishing at Port-Daniel in 1976 and in that same year, fishing off Escuminac was poor.

Herring spawn in the area in both spring and fall.

Statistical District 70

Port: Neguac, Burnt Church and New Jersey

Comments:

Where: Most are small fishermen that fish in the spring at Burnt Church and Hay Island for lobster bait. One large boat fisherman travels from Gaspé to Richibucto.

When: The fall fishermen will fish from first week of August to end of September.

How: Most set gillnets.

Recent catches: For last 4-5 years catches have been almost nonexistent; used to be able to get bait but now can only catch 2-3 barrels in three weeks of fishing; now have to buy bait.

Misc.: Four to five years ago, there used to be in fall fishery off Burnt Church; now there is none, although some herring seem to be offshore in the fall. Local fishermen blame overfishing by the large seiners for the depletion in the herring.

Comments were made that a newly expanding sand bar has deflected fish towards Escuminac.

Some fishermen claim that all the fishing in the Miramichi Bay is dead; this could be due to pollution but more likely overfishing by larger vessels.

There is some feeling that once a spawning stock is fished out of an area, it will not return there.

Statistical District 73

Port: Escuminac and Baie-Ste-Anne

Comments:

Where: In spring, all fishing occurs off Escuminac.

In fall, fishermen travel anywhere from Cape Richibucto to Gaspé and P.E.I. although the majority fish from Point Escuminac to Cape Richibucto. The amount of travelling depends on the size of the boat and weather.

When: In spring, from beginning of May to second week of June.

In fall, from beginning of August to middle of September.

How: Most fishermen either have large nets and hydraulic rollers or are trying to get them.

Recent catches: In the spring of 1978, the herring seemed to be more spread out all along the shore, consequently enabling all the fishermen close to shore to do well. The larger boats which fish further offshore did well overall but as the fish appeared more clumped offshore, not all fishermen experienced high catch rates.

The fall of 1977 was a very bad year for herring as have been the previous three years. Good fall catches were last experienced in 1974.

Misc.: Some fishermen would like to see a summer herring fishery started. On account of the high catch rates in the spring of 1978, more fishermen are anticipated to enter the fall fishery.

Statistical District 75

Port: Point Sapin and Kouchibouguac

Comments:

Where: Most fishing in spring from Pt. Escuminac at Point Sapin.

When: From ice breakup to end of May.

How: Set gillnets.

Recent catch rates: Good spring and fall catches over 1977 and 1978.

Misc.: There were complaints of crowded fishing conditions at Escuminac in the spring which were causing gear conflicts. There were also complaints about the large boats with rollers fishing the herring offshore before the small inshore set gill netters get a chance to fish.

Statistical District 76

Port: St. Louis-de-Kent and Richibucto

Comments:

Where: All big boats go to Escuminac in spring. In summer, herring is caught as by-catch to mackerel fishery off Richibucto.

When: In spring, from ice breakup to end of May. In summer, from first of June to beginning of August.

How: The large boats (about 12 in this area) have large nets and rollers.

Recent catches: Good catches at Escuminac in spring of 1978. As well, there were high by-catches of herring during the summer 1978 mackerel fishery. Many expect a good fall fishery.

Misc.: There used to be spring fishery in the area but this was fished out by the purse seiners. Only the big boats make money but even then, crowding in the spring Escuminac fishery is becoming a serious problem.

Mackerel: Poor catches of mackerel in summer of 1978. One fisherman believed that the herring had driven the mackerel away.

Statistical District 77

Port: St. Edward-de-Kent and Cocagne

Comments:

Where: In spring, fish at Escuminac. In summer, some herring by-catch with mackerel.

When: In spring, from ice breakage to end of May. In summer, for July and August.

How: Set and drift nets.

Recent catches: Local fishing off wharves almost nonexistent while fishing at Escuminac is exceptional.

Misc.: More fishermen from this area may enter spring Escuminac fishery. Local spring fishing is just a hobby or for fresh lobster bait. A fall fishery could be developed in this area.

Mackerel: Poor mackerel catches in this area over last few years.

Statistical District 78

Port: Shediac and Cap Pelé

Comments:

Where: In spring most fish at Escuminac as well as local fishing.

In summer, fishing for mackerel and herring off Cap Pelé.

When: In spring, from ice breakup to end of May.

In summer, during July and August.

How: Set nets in spring and drift nets in summer.

Recent catches: An early run (around 5 May was experienced in the spring of 1978. As well catches were more consistent during this spring.

Misc.: Some fishermen blame the Canso Causeway for the poor herring fishing in the area. They stated that the high catches experienced in the spring of 1978 were due to an opening of the causeway gates.

A few believe that herring move west to east through the Northumberland Strait, not the other way around.

Mackerel: Poor mackerel catches reported in 1978. One fisherman feels that mackerel move west to east in Strait.

Statistical District 80

Port: Bayfield, Cape Tormentine and Port Elgin

Comments:

Where: Most fish from Shemogue Head to Cape Tormentine. Some fish on P.E.I. shore and at Escuminac in Spring.

When: Fishing starts immediately upon ice breakup; the length of the season after that varies considerably for each fisherman. In general, if they have a scallop licence, will fish for herring as long as catch rates are good; otherwise they will fish for scallops. Non-licenced fishermen will fish for herring from April to September.

How: Set gill in spring and drift nets in summer and fall.

Recent catches: As in statistical district 78, there was an unusual early run in spring 1978. There was a good run in June 1977 as well.

Misc.: Fishing is drastically reduced compared to 15 years ago; Many blame the Canso Causeway for this. As is statistical district 78, some fishermen attribute unusual spring run to opening of Causeway gates. Scallops licences are big issue in this area.

Mackerel: Concentrate more on mackerel than herring during summer and fall; use mackerel for lobster bait.

Statistical District 82

Port: Skinner Pond

Comments:

Where: Both locally and at Escuminac.

Local fishermen will fish anywhere from Kildare to Howards Cove.

When: Month of May.

How: Shallow set nets of various mesh sizes, hauled by hand.

Recent catches: Reported fair catches in this area during 1978. Noted that it would have been better but fish didn't stay long, (one short big run).

Misc.: Only one fisherman from here goes to Escuminac.

Herring spawned here in spring 1978 and at Kildare; haven't seen much spawning in these areas for 20 years.

Mackerel: Wasn't any more then last year but has been bad for two years now. They are a good size of fish. Didn't have any idea what they eat.

Statistical District 82

Port: Minimegash

Comments:

Where: About 12-14 boats fish at Escuminac in the spring and usually land fish there. A large number fish at Minimegash but will go as far as Borden.

When: Those that go to Escuminac fish for about 3 weeks in May. Local fishermen fish as soon as ice is out until the end of May. At one time there were fall fish here but no one trys for them now.

How: All the fisheremen interviewed used large numbers of shallow set nets of various mesh sizes that they hauled by hand.

Recent catches: Catches at Minimegash were extraordinary in 1978. There hasn't been as many fish for over 20 years and there is no explanation. Two years ago 11 crates was considered good; this year got 200-300 crates.

Misc.: Some talked in support of limiting the number of nets.

Mackerel: Last 4-5 years has been good for set fishermen, but this year was poor. Don't notice any difference in size of fish. They think the only thing mackerel eat is plankton.

Statistical District 82

Port: Campbellton and Howards Cove

Comments:

Where: Six to eight boats from Howards Cove go to Escuminac to fish in the spring. Ninety-eight percent of the catches are landed at Escuminac. Other smaller fishermen fish locally for herring. Occasional Escuminac catches will be brought back to P.E.I. to sell to local fishermen.

When: Local fishermen will start as soon as ice is out until the 1st week of June. Ice is usually out by the 20th of April. Those that travel to Escuminac wait until they hear the fish are running. Usually fish for 3-4 weeks in the month of May.

How: The nomadic fishermen use large numbers of shallow gillnets and haul them by hand. The local fishermen use the same kind of nets but in much fewer numbers.

Recent catches: Those that fish at Escuminac reported significantly better catches recently. Also noted however, that weather was much better then last year which meant more days were spent fishing and fewer fish were lost. Local fishermen reported exceptional catches as well; has been good for two years here.

Misc.: Fishermen in this area usually sell herring to north shore fishermen for lobster bait. All reported that herring were bigger this year.

Mackerel: Noted that seiners weren't doing well with the mackerel because the fish have to be seen on surface schooling before they can be caught. Claims that set net mackerel fishermen have been doing well at Alberton for the last 2 years. Mackerel fishermen on this side with set nets didn't do well this year so far. Seiners also reported poor catches.

Statistical District 82

Port: West Point

Comments:

Where: most of the fishermen try at West point first but won't hesitate to move anywhere from Minimegash to Borden if they think fishing will be better. Two or 3 boats go to Escuminac in the spring regularly.

When: Start fishing as soon as the ice is out until the end of May. Ice is usually out by the 3rd week of April. Some will put a couple of nets in the fall to catch a feed of herring.

How: Most have large numbers of set gillnets. The nets are all shallow (40-60 meshes). Various mesh sizes are employed but recently are tending more towards smaller mesh because of high demand of fish.

Recent catches: Seems it was good for the early part of the 1978 season but dropped off. Wasn't any worse then previous years. Spawning in this area has been reduced in the last 3-4 years.

Misc.: One fisherman thinks he will quit fishing at Escuminac since fishing seems to be picking up on the island. Most reported bigger fish this year. Large numbers of herring were reported more offshore in the Northumberland Strait.

Mackerel: Mackerel catches by set nets have been very poor for the last 2 years. Those that are caught are a good size. Noticed that they come close to shore in the fall and feed on small schools of fish. The small fish are called "tinkers".

Statistical District 83

Port: Cape Egmont

Comments:

Where: In this area, the fishermen have a large choice of locations to fish. They will fish at Cape Pelé, N.S., or Escuminac, N.B. or anywhere from Borden to Miminegash. In order to make a profit they have to move. What often happens is that a few fishermen will get some fish and the next day there will be 40 boats in the same area.

When: From about the 1st of May until the 2nd week of June.

How: Use shallow nets which they haul by hand. Usually have about 40-60 nets. Everyone has nets with about 50% of the fishermen consistently trying for herring every year.

Recent catches: Those that find the right places reported good catches in 1978. Best fishing was on the N.S. and N.B. side of the Northumberland Strait. In this area fishing has been poor for the last 8 years, and hasn't shown much sign of improvement.

Misc.: They have a fishermen's co-op here and if it is at all possible they sell their fish only to the co-op no matter where they are caught. Most that are bought are from P.E.I. and not usually from N.B. or N.S.

Mackerel: Very poor catches reported particularly in spring of 1978. Has been poor ever since they built Canso Causeway. Fish used to hit south shore first but now hit north shore first and move the other way. They were a good size this spring but not any bigger then usual. They have found a lot of capelin in the stomachs lately. Most were caught at Richibucto.

Statistical District 83

Port: Borden

Comments:

Where: Only 3 herring fishermen in this area. All of these fish at Borden on either side of wharf. A lot of boats come from the Cape Egmont wharf to fish here.

When: Last week of April until the 1st of June.

How: 40-50 shallow set gillnets hauled by hand.

Recent catches: Wasn't very good here in 1978 because wind caused fish to move to the N.B. side. Has been poor for last 10 years.

Misc.: Herring used to spawn here in the fall but haven't seen any for 3 years. Used to get them on lobster traps. Different companies come to Borden wharf to buy fish. They are lucky to have choice of herring or scallops to fish and will concentrate on the one that has the highest catch rates in a particular season.

Statistical District 83

Port: Victoria

Comments:

Where: All fish Victoria harbour just outside a large sand spit.

When: Only fish after the ice goes out to the 2nd week of May; after that not worth fishing.

How: Use 10-15 shallow gillnets hauled by hand.

Recent catches: Most reported good catches in 1978. One fisherman said that it was his best spring in 17 years. Another fisherman said he did better last year than this year.

Mackerel: Not many fishing them at Victoria, but heard reports that there were some good catches at Cape Tormentine recently (end of July).

Statistical District 85

Port: Rice Point

Comments:

Where: Fish at the new wharf in Rice Point. None go to Escuminac.

When: Start last week of April and finish 1st of June.

How: Shallow set gillnets anchored and hauled by hand.

Recent catches: Some had exceptional catches in spring 1978 while others did the same as usual. Overall catches have improved.

Misc.: Spawn here only in the spring on sandy bottom. Used to be fall fishery but nobody fishes them now because they can't afford investment in offshore drift netting.

Statistical District 86

Port: Wood Island

Comments:

Where: Fish right at Wood Island in the spring. In the fall one fisherman goes to Pictou and Caribou Island.

When: Has been exclusively a spring fishery from the 1st of May for about 2 weeks. This year is the first attempt at fall fishing running for about the month of August.

How: Use large mesh set gillnets about 75 mesh deep.

Recent catches: Haven't caught any herring in two years. Has been 5-6 years

since enough bait was caught by one fisherman.

Misc.: Never seen any evidence of spawning. Others that lost scallop licence are also considering investment in the fall fishery at Pictou and Caribou Island.

Mackerel: One fisherman has been line fishing here. Fishing has been bad for at least 2 years. Six or 7 years ago could catch mackerel anywhere by dropping a line in the water. Now you have to search for them and seed the water with fish meal.

Statistical District 87

Port: Beach Point

Comments:

Where: Some fishermen from here go to Escuminac. There appears to be no local herring fishing.

When: Fish are most abundant in fall, (July and August).

How: The government is sponsoring an experimental mid-water trawl fishery. Fishermen think there are quite a few herring around fishermen's bank.

Recent catches: Haven't been fishing them but have seen large schools of herring on the sounder. A few fished in spring but didn't get anything. Also finding large numbers of 6" herring in the area. There were large numbers near wharf in June 1978.

Misc.: If the herring do pick up here no one would fish them since they are doing well with the groundfish and wouldn't want to invest in such an unpredictable fishery as herring.

Mackerel: Lots of mackerel in the area but nobody bothers to fish them. A few jig for pleasure or bait. Some put drift nets in now and then.

Statistical District 87

Port: Graham Point

Comments:

Where: Herring are ignored in this area. A few fish for bait but not many.

When: The odd net is put in during the lobster season of May and June and August and September.

How: Mostly drift nets.

Recent catches: Even when there was lots of herring here nobody fishes for them other than for bait.

Misc.: Fishermen believe fish here are on their way to spawn at Pictou and Caribou Island.

Mackerel: Lots of mackerel here but are only jigged for recreational purposes.

Statistical District 87

Port: Georgetown and Montague

Comments:

Where: Any that do fish, fish locally inshore or at Fishermen's Bank. It was very difficult to get anyone to talk about the herring here. Most fishermen that fished here only did it sporatically.

When: During 15th April to the 15th of July set net for herring. During last 3 weeks in September drift net for herring.

How: Drift and set nets.

Recent catches: Hasn't been any in the spring for years. Some good catches in fall of 1977 at Fishermen's Bank but never lasted long (about 3 days).

Misc.: Reported large numbers of small 6" herring at Fishermen's Bank.

Mackerel: Poor in 1978 but was better in 1977. Hasn't been any good fishing since the causeway was built. Find lots of crab and lobster young of the year in their stomachs.

Statistical District 88

Port: Launching Point and Annandale

Comments:

Where: Fish locally for bait.

When: During spring lobster season. Some have nets in the fall for something to do.

How: Very few bother to fish herring. They just buy their bait.

Recent catches: Haven't been any fish here for 7 years. One fishermen got good catches in fall 1977.

Mackerel: Poorer in 1978 than 1977. Fish mackerel with set nets, anchored at one end.

Where: All fish inshore in Naufrage area.

When: Only fish May and June during lobster season for bait.

How: Use a few (2-3) shallow set nets in early spring. Some then use 150 mesh deep mackerel drift nets in last 3 weeks of June.

Recent catches: Are usually able to get enough for bait. Hasn't changed much in the last 10 years. Lots of herring in fall but not fished.

Misc.: Spawn here every spring. Haven't seen many small herring. Used to get quite a few in the cod stomachs.

Mackerel: Poor in 1977 but a little better in 1978. They eat just about anything, are bottom feeders, eat small mackerel, and shrimp. Also come up to school when there is a lot of spawn or small frys floating around. Spring mackerel which are usually large seemed small in 1978.

Statistical District 92

Port: Tignish

Comments:

Where: A couple of boats from here fish at Escuminac. Almost all lobster fishermen fish for bait locally.

When: Fish about the 20th of April to the 2nd week of June then mackerel season starts. Catch herring with mackerel nets all through summer but not many. Get a fall run of herring in August and September but not fished hard.

Recent catches: Reported better catches in the spring of 1978 than previously.

Misc.: Herring spawn here in both spring and fall.

Mackerel: Seiners reported very poor fishing because fish are not rising up and schooling. Has been poor for the last 5 years but has no idea as to what happened. They think there are lots of fish but they aren't schooling. Noted that the fish that are caught are a good size. On the other hand set net fishermen reported better fishing this year. Could catch mackerel just about anywhere. The fish being caught were all quite big.

Statistical District 92

Port: Alberton

Comments:

Where: They fish about four miles outside of the Harbour in the Gulf of St. Lawrence for lobster bait only.

When: As soon as the ice goes out, they will put their nets in (usually around the 20th of April). Fish no later than the 15th of June, some quit a week earlier. Some recently have been fishing the fall herring in August and September.

How: In the spring they use set nets. Fifty mesh deep of varying mesh size. In the fall, use mackerel drift nets which are 150 mesh deep and 2 7/8" mesh.

Recent catches: Most reported exceptional catches in 1978. Also reported unexpected catches of herring in large numbers in June and in mackerel nets in July. All thought herring are coming back in the area.

Misc.: Reported that fish seemed bigger this year.

Mackerel: Got only one good week of mackerel in June 1978. It has been bad here for at least 5 years but nobody seemed to have any ideas why. All agreed that the mackerel were bigger and weren't schooling. Claimed that fish had to be a certain size to school, a 3/4 lb mackerel will school while a 1 to 1 1/4 lb mackerel won't school. Mackerel were better in fall 1977 than usual; one fisherman caught quite a few in October and November which is quite unusual. In July they feed on "red feed" and seem to school when feeding. Also seem to school more before or after a storm.

Statistical District 93

Port: Malpeque

Comments:

Where: All fish along coast in Gulf of St. Lawrence from Malpeque to as much as 5 miles towards French River.

When: Fish for 3 weeks after the ice goes out. Time that the ice goes out varies because they are on north side. Some put nets in the fall to get some to salt for the winter.

How: Use 75-100 mesh deep set gillnets.

Recent catches: Haven't caught any herring here for 10 years. Do not blame the seiners for overfishing. Some of the seiners from this harbour didn't bother to fish this season. Haven't noticed any difference in size of fish.

Statistical District 95

Port: French River

Comments:

Where: Just outside of New London Bay.

When: Only fish a week to ten days after the ice goes out. Don't bother during lobster season. In the fall will put a net in for a feed.

How: Set gillnets of various depths and mesh sizes.

Recent catches: Were better in spring of 1978 than previously. Got a short fast run of herring which then disappeared.

Misc.: Spawned here in June 1978; the eggs covered the lobster traps.

Mackerel: Has been poor here for 6 years. Fishermen blame decline on large numbers of seiners that have overfished mackerel.

Statistical District 95

Port: North Rustico

Comments:

Where: All fish just outside of Rustico Bay in a small cove.

When: They put their nets in as soon as the ice goes out. The ice will go out sometimes between the 2nd week of April to the 1st of May. Most then fish for about 3 weeks but others keep nets in for an additonal 2 weeks.

How: Most use 6-10 gillnets for either 75 or 50 days.

Recent catches: All reported better catches in 1978 than previously. Most got their bait themselves which is unusual.

Mackerel: Fishing has been poor for about 2 years. Lately have reported to be seining around tourist boats; they also jig mackerel. Doesn't know what caused the decline.

Statistical District 96

Port: Cove Head

Comments:

Where: They fish east of Tracadie Bay in the Gulf.

When: Fish for about 3 weeks after ice goes out which is usually around 1st of May.

How: About 6 fishermen with about 25 nets total fish for herring. Shallow set gillnets.

Recent catches: Catches were better in 1978 than for the last 8 years.

Mackerel: Were good in 1978. Don't see small fish in their stomachs like you do in cod. Mackerel go to the bottom to spawn in July.

Statistical District 96

Port: Tracadie

Comments:

Where: Sail up off Tracadie and fish in the Gulf just outside Bay.

When: Season varies here a lot because of ice conditions. Will start anywhere from April 10th to May 10th. Usually fish for 3 weeks after they start.

How: Use set gillnets of various depths and mesh sizes.

Recent catches: Herring catches were the best they'd been for a long time in 1978.

Misc. As the fishing picks up more fishermen dig out their nets and put them in the water. Spawn here in July (see spawn on cod nets). Fishermen think fish are getting smaller.

Mackerel: Has been poor here for 4 years. They blame seiners for overfishing mackerel because they follow fish as they move around and are fishing the same stock continually. Spring mackerel are bigger then summer mackerel. At one time there were large fall mackerel but fishermen think they have been fished out. Mackerel are a good size this year but aren't schooling. Don't see as many young mackerel as you used to.

Statistical District 96

Port: Savage Harbour

Comments:

Where: Just outside Savage Harbour in the Gulf of St. Lawrence.

When: Only fish for 3 weeks from June 10th to 1st of July.

How: Use 150 mesh deep mackerel drift nets. Often more mackerel than herring. Once lobster season is over, they no longer use the nets.

Recent catches: Get about ½ a box a day. Hasn't changed much over the years.

Misc: Some reported spawn on lobster traps in the spring. Also say there are a few large fall herring.

Mackerel: Poor for the last 2 years. Doesn't know what happened to them. Think they eat just about anything they can get in their mouths. If you get any it will be for 3 weeks in July, after that you won't see them again until November. Seem about the same size as always.

Appendix E

Comments received from fishermen during mail survey.

This section contains comments made by fishermen who replied to the mail questionnaire, on the status of the herring fishery in the area. They are organized by statistical district and within statistical district, by English and French replies.

The comments were edited in some cases to allow easier reading. In no case, as far as the authors perceive, was the meaning of any comment changed by this process.

Note that these comments in no way reflect the opinions of the government, only those of the surveyed fishermen.

Statistical District	Comments
2	There are no herring here to catch. They are only inshore for a short time in September. In the past, we could get a bucket or so. Now there is hardly any. If you get a bucket, you would do well. It's been like that for the last 20 years. About 25 to 30 years ago, there were lots of herring. We don't know the reason for the decline.
13	Herring fishing has not been a paying proposition in Arisaig Point for almost 20 years. This year (1979) herring came along our shores. I have not fished herring before but because of the optimistic outlook of the herring fishery off Arisaig, I intend to be fishing next year. Many of the seiners in the Strait believe that the ban of the seiners in the Strait has allowed the herring to migrate past Pictou Island down Arisaig Point. If this year is any indicator of what the future is, then many of us will be fishing herring. We had a hard time getting nets this year. The season was almost over by the time we got them.
45	The herring catch has been extremely low in our area. Very few fishermen are now involved.
63	This is the last place on Restigouche River that herring spawn. No fall herring come up here like they used to 15 years ago.
	Last year (1978) the herring seiners were in the Chaleur Bay and did not leave many for the local fishermen.
	Please try to keep herring seiners out of this area because this is a herring spawning ground.
	Since 1974, I hardly got enough herring to bait my traps (113 of them).
	Each year I fish herring for bait, consumption and sale, but for the last couple of years, there was not even enough for bait.
	Prior to 1975 there was more herring, than now Therefore catches with 2 or 4 nets were as good as with 12 to 20 nets in 1979.
65	Not enough herring left after the large seiners get their quota in the Bay of Stonehaven. We cannot get enough to bait our lobster gear.
	In the last five years, the herring catch has been so poor that we were unable to catch enough herring to bait our traps. There are a few spots where some of the fishermen get a few catch of herring. There should be something done to protect the herring.
	The last two years I've been fishing with my father. Fishing for lobster and herring has been poor in this area and we have to buy herring to bait the traps except in some spots along the shore. Some fishermen get some and there should be something done about it.
	The government policy has nearly destroyed the fishing of herring in this part of the Bay of Chaleur. We set 5 herring nets last spring, and had to buy 90% of the herring to bait our lobster traps.
	When I started fishing in 1938, we had lots of herring for bait and also used herring on the land for fertilizer. Spawn lay on the beaches 3 and 4 feet deep which we also used on the land. There was no limit to what we could catch with one net. This continued until the Government brought in the seiners to the east coast. Now we do not get enough bait and there is never any spawn on the beaches. It is my belief that Government Policy has destroyed our inshore herring fishery.

With the price of herring today, it would have been a gold mine to the inshore fishermen.

If the government continues with the present policy it will be the end of the herring fishing.

Since the seiners get it all in the Gulf, the herring do not come in the Bay of Chaleur any more. In the years 1940-1960 the catch was good.

No more herring in the Bay of Chaleur.

I only fish herring for my own use as bait. There is not enough herring to make expenses at fall season.

65 Depuis les dix dernières années, la pêche au hareng n'en vaut plus la peine. J'ai six filets et je perds mon temps. Je n'en prends pas assez pour manger. Comme vous le savez peut-être, le hareng n'a pas le temps de se rendre ici. Tout est pêché par les gros bateaux à l'entrée du golfe.

J'ai bien fini de pêcher au filet parce qu'il n'en reste plus assez pour vivre comme ça. J'ai déjà vu beaucoup mieux, mais je n'ai jamais vu pire.

La pêche est tellement mauvaise que je dois l'abandonner. J'ai fait $14,000 de déficit. Les personnes responsables de la pêche au hareng disent que le hareng n'a pas diminué. Je me demande alors où est passé le hareng. Je sais qu'il y a beaucoup de petits harengs.

La saison 1979 été très pauvre. J'ai pris du hareng juste pour l'appât.

Le changement qu'il y a eu depuis 1971, vous devez le connaître. Ce ne sont pas les petits pêcheurs qui ont détruit le hareng, ce sont les gros seineurs. Bientôt vous n'aurez plus à envoyer vos formules car il n'y aura plus de hareng à prendre.

Depuis 13 ans le hareng a diminué de 99%. J'ai fait un énorme déficit de $6 000.

Il y a 25 ans que je pêche le hareng. J'ai élevé 10 enfants sans misère avec la pêche au hareng. Maintenant je ne pourrais plus en faire vivre un seul, parce qu'il n'y a plus de poisson. Les seineurs ont tout détruit. Nous à Caraquet, la pêche était notre seul gagne-pain. Pourriez-vous faire quelque chose pour sauver la situation?

66 Il n'y a plus de hareng. Les seineurs les ont détruits.

Le hareng est rare le pringtemps, et depuis quelques années il n'y en a plus du tout.

Les captures ont augmenté depuis 1975 sauf en 1979 quand elles ont diminué de 50%, même si j'avais un plus grand nombre de filets.

67 Since 1973, no fall fishing because not enough herring to be payable. Too far to go for us inshore fishermen. Herring is to far from the shore.

This year (1979) was a little better than the past five years or maybe more, since the big boats came to fish.

In the year 1960 the herring fishing was payable but since the 1970s not payable.

Les trois dernières années on n'a pas pêché le hareng, parce qu'il n'y en a plus.

Dans les années 1971, je pêchais moins le hareng. A ce moment la morue et le hareng se vendaient peu. Depuis 1973, je consacre plus de temps à la pêche au hareng. Au début, on pouvait en vendre plus. La période du temps de la pêche était presque la même chaque année. Depuis, j'ai amélioré mes agrès de pêche de beaucoup, mais sans résultat. Le hareng a tellement diminué que ça ne vaut plus la peine de le pêcher.

68 No herring as in the past. None later on (after June) as 65 foot seiners come inshore and clean out herring.

Depuis 7 ans j'essaie de pêcher le hareng. Il n'y en a plus par ici. Vous devriez envoyer vos questionnaires aux gros chalutiers qui viennent chaque année pêcher avec leurs gros filets. Ils détruisent tout: hareng, morue et homard. Il ne reste rien derrière eux. Ouvrez-vous les yeux!

Je pêche pour appâter mes trappes. Depuis 7 à 8 ans nous avons de la difficulté à prendre assez de harengs pour la boette de nos trappes. Auparavent il y avait du hareng à ne savoir qu'en faire.

Je pêche le hareng pour mes trappes. Nous ne pouvons capturer assez de harengs pour nos trappes, même avec 8 à 10 filets. Il faut en acheter pour appâter.

Il n'y a plus de hareng. Pour appâter nos cages à homard il nous faut acheter les restes des usines.

70 We never get more than 20-30 barrels. Some years we get a few good days but last year we got approximately 10-15 barrels.

We cannot fish all the herring season, because there are no herring since the big boats started fishing. They took all of them before the herring came where we fish.

We only fish herring for bait, and for the last 5 years there was none, so we had to buy it.

The herring catch has been declining since 1975.

Par ici il n'y a pas assez de hareng pour prendre la peine de pêcher.

La zone limite de 200 milles a été très importante pour la pêche côtière. Les résultats sont concluants.

On pêche le hareng pour notre appât. Les dernières années, on est obligé de l'acheter car on n'en prend pas assez pour la pêche au homard.

Je pêche pour appâter mes cages à homard. Les trois dernières années, on n'a pas pu en prendre pour notre appât.

Par ici ça ne vaut pas la peine de pêcher le hareng. Il n'y en a pas assez. Les gros bateaux les ont presque tous détruits. On en a eu l'expérience à Caraquet aussi. Les gros bateaux l'emportent sur les petits bateaux. Le petit hareng n'a pas le temps du tout de venir à la côte.

71 I fish only for bait. Last spring there was none at all. Here I got half a barrel all spring - so I don't know what is wrong. They used to be here but not now.

73 The year 1978 was very good but 1979 was less than 1978. 1978 was a year never seen since many many years ago.

I just fish a small rig along the shore since 1971. Before that time we used to get good fishing, but since they have been getting scarcer each year and we do not have them spawning. In my opinion, unless there is a closed season for even a short time both spring and fall they will be fished out.

Gillnets are almost a thing of the past. One time I used to get 15 barrels to the net (in 1965)

73 Si les seineurs n'arrêtent pas de venir pêcher de notre côté, le hareng est fini pour les 10 ou 12 années à venir.

Les seineurs prennent le hareng avant qu'il n'arrive à la côte. Les petites pêcheurs n'en prennent pas tellement.

Il n'y a pas de hareng à Ste-Anne du Kent depuis au moins 15 ans. Nous sommes obligés d'aller à Escouminac ou à Pointe Sapin. En 1979, lorsque le hareng est arrivé à la côte pour frayer, la température n'était pas bonne. Le hareng n'est pas resté à Ste-Anne, ni aux alentours. Il n'y en avait que quelques douzaines par filet. Ce n'était pas rentable.

La pêche au hareng n'est plus rentable. Durant les dernières années, les pêcheurs côtiers du printemps ont subi des pertes considérables.

75 Along the coast of Richibucto Cape and Pte Sapin and also Escuminac during the years 1970 to 1975 the herring catch were reasonably good but since then has been going down every years, and now the catches are very poor as much as not being worth setting any nets at all. These last few years, as a matter of fact, very few herring are seen or noticed coming or I should say has a chance of reaching the shore to spawn. At one time herring eggs were so thick they

used to be washed to shore in a breeze or storm.

Les années 1946 jusqu'à 1968 étaient très bonnes pour le hareng, même si les prix n'étaient pas très bons. Mais après cela a été un désastre! Aujourd'hui les prix sont bons, mais il n'y a pas de hareng, c'est-à-dire pour les pêcheurs côtiers. A mon point de vue, les seineurs n'aident pas trop la pêche côtière: surtout s'ils pêchent dans le golfe Saint-Laurent où le hareng est pris avant de se rendre à sa grosseur.

76 There should be a limit on the number of nets and date for the seiners to start fishing.

77 1978 was record year for herring catches.

78 Out of 55 nets for herring starting from May 1, 1979 to May 20, 1979, very poor catch of 5½ ton was landed. 1978 was poorer yet.

Herring landings have been very poor in the central port of Northumberland Strait.

The herring has been goint down since 1975 and this spring (1979) there was none at all.

80 In 1978 no herring as the Seiners have them all caught before they get into the Straits to spawn so don't know what to do this spring.

83 In 1979 was the worst season for fishing herring.

About 15 years ago I could get all kinds of herring with about 10 nets. In 1979, I fished 45 nets for 6 weeks and I got 3,000 lbs. That's the story for the last 5 or 6 years. If nothing is done for the herring fishery very soon you can forget about herring fishing.

85 Herring fishing from April 28 to May, 1979 was terrible. In 1978 the herring stocks seem to be a little better but far from good.

86 Herring fishing has decreased in the last ten years and I think that there should be a limit on the number of nets to be fished per boat, as some fishermen fish as many as 25 nets which is more than they can tend properly. Consequently, the fish go to waste. It also makes it difficult to find a place to set nets as most fishermen leave their nets out day and night.

88 Fishing was much better in May years ago than now.

Catches every year are getting scarcer due to many herring seiners taking so many small ones and tearing up the spawning ground inshore.

92 Keep the large seiners and draggers out of the Gulf of St. Lawrence.

I don't have any record of catches but let me say this - in 12 years of spring herring fishing, only the "1979" spring fishing was worthwhile. In all other 11 years, the most I can recall landing was about a ton. Its too much for me to believe that herring is on its way back with all those large herring seiners roaming the Gulf. Its the same with cod. Everything is caught at the entrance of the Gulf.

93 We got more herring this spring than we got for ten years, but we had to buy bait.

95 In the years 1965-66, we got lots of herring in our mackerel seine. Since 1966 there has been one. We used to get herring in nets in August and September before 1965. Now there are very few.

There has been no herring in the fall for the last 12 years. We got a very limited supply the following spring. We had to buy herring the spring for our lobster bait.