Collection and Interpretation of Catch and Effort Data from the Division 3L Inshore Capelin Fishery

by

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ABSTRACT

A comparison of data from research logbooks and Statistics Branch information indicated that catch/effort indices derived from logbooks corresponded to trends in mature capelin biomass from 1981-83. Purse seine logbooks collected by Statistics Branch may be used to replace the research logbooks provided that enough logbooks are returned. However, no alternative method was found to replace using logbooks for fixed gear fishermen. Logbook records provided estimates of catch/effort indices, discarding, and bycatch and descriptions of fishing pattern and capelin behaviour which were otherwise unavailable from purchase slips collected by Statistics Branch. Several problems with purchase slip data were presented. The use of logbook records assumed that fishermen were reasonably accurate in their bookkeeping. Some evidence was presented to tentatively assume this holds for the capelin fishery, although it still remains a point of contention. Considering the quality of data from the commercial fishery that is available from Statistics Branch, logbook records remain the most effective way to quantify the information.

RESUME

Une comparaison entre les données des journaux de bord de recherche et l'information provenant de la Direction de la statistique indique que les taux de capture provenant des journaux de bord correspondent à l'évolution de la biomasse des capelans adultes entre 1981 et 1983. Les journaux de bord des senneurs recueillis par la Direction de la statistique peuvent être utilisés à la place des journaux de recherche, pourvu qu'un nombre suffisant de journaux le bord soit reçu. Cependant, on n'a trouvé aucune solution de rechange à l'utilisation de journaux dans le cas des pêcheurs utilisant des engins fixes. Les journaux de bord ont fourni des estimations des indices de prises par unité d'effort, des rejets et des prises accessoires, ainsi que de l'information sur les habitudes de pêche de même que sur le comportement du capelan, renseignements que les bordereaux d'achat recueillis par la Direction de la statistique n'apportent pas. Plusieurs problèmes portés par ces borderaux furent présentés. Le recours aux journaux de bord présupposait que les pêcheurs tenaient leurs livres de façon assez précise. Des faits furent présentés qui laissent croire que tel est le cas pour la pêche au capelan, bien qu'on émette encore certaines réserves à cet égard. Compte tenu de la qualité des données sur la pêche commerciale qui sont recueillies par la Direction de la statistique, le recours aux journaux de bord demeure le meilleur moyen de quantifier l'information.

INTRODUCTION

The inshore capelin fishery in Newfoundland is prosecuted by fixed gear (capelin traps, beach seines) and mobile gear (purse seine) fishermen. During the 1970's a commercial offshore fishery dominated capelin landings in Div. 2J3K and 3L. When catches declined the offshore fishery was closed in 1979 in Div. 3L and in 1980 in Div. 2J3K. The landings by the inshore fishery have increased since 1978 (Table 1) primarily to supply Japanese market demands for roe capelin.

In 1981 a program was initiated to collect catch/effort statistics from the inshore capelin fishery. Statistics Branch collected landings and effort data from the purse seine fishery in the form of purchase slips and commercial pelagic species logbooks and landings from the fixed gear fishery as purchase slip information. No effort data were available for the fixed gear sector. The amounts and dates of landings from vessels greater than 35' in length were readily obtainable, however, only daily totals per community were available for landings by vessels less than 35' in length. To determine landings by individual fixed gear fishermen we resorted to the laborious measure of recording information from all the purchase slips. It was apparent from the outset that the data as they were being collected and entered into the computer file were inadequate to estimate catch/effort statistics for the inshore capelin fishery with any degree of reliability. Moreover problems such as discarding, by-catch of other species, difficulties in selling capelin, and local variations in distribution were not being addressed by purchase slip data.

To illustate the effectiveness of the logbook survey versus the data available from Statistics Branch, this report will examine the two data collection systems and compare their effectiveness using the Div. 3L fishery as an example. The Div. 3L fishery was chosen because it represents the bulk of the landings, it is the main focus of the logbook survey, and it is the area which has the majority of problems with regard to discarding, by-catch and sales.

MATERIALS AND METHODS

In 1980, the Div. 3L capelin fishery was designated a limited entry fishery which required all full-time capelin fishermen to be licensed. This facilitated our efforts to subsample a proportion of the fishermen to estimate catch/effort indices and other trends in the commercial fishery. All purse seine fishermen in Div. 3L and a proportion of fixed gear fishermen per bay were selected for the 1981 survey. Quotas in Div. 3L were allocated by gear type by area which made this breakdown among fishermen relatively easy to organize and analyze. Each area was subdivided into statistical sections (Fig. 1). Because of the time and effort required to personally contact each fisherman to obtain his cooperation we chose to concentrate our efforts on one section per area. This assumed that each section or sampling site was representative of the capelin fishery in the area. One section with high fixed gear capelin landings per bay in 1980 was selected and all licensed capelin fishermen residing therein were contacted about participating in the 1981

survey. These were: section 12 in Bonavista Bay, section 18 in Trinity Bay, section 21 in Conception Bay, and sections 24, 25, and 26 on the Southern Shore (Fig. 1). In 1980, 15 commercial logbooks were available for catch/effort analysis for the purse seine fishery. It was apparent that the data in some logbooks were unusable and that a large majority of the purse seiners had not filled out logbooks. Therefore we sent logbooks to 70 purse seine fishermen in Div. 3L to increase the number of logbooks returned from the mobile sector.

In 1982, the coverage was expanded by selecting fixed gear fishermen from other statistical sections in Div. 3L which were not included in the 1981 survey. Fishermen who did not fill out the logbooks in 1981 were excluded from the 1982 survey. The choice of fishermen followed a cluster sampling design (Hansen et al. 1953) where sections were treated as clusters and communities as primary sampling units. An arbitrary criterion to have enough fishermen in each section to account for at least 20% of the fixed gear landings was aimed for in the design. Sections where landings were less than 10 mt were ignored except the Southern Shore. Fixed gear fishermen were selected on the basis of their landings in 1980 and 1981. At least one fisherman per fishing community was contacted to spread the coverage throughout the section. The number of fishermen per section was in proportion to the total number in any one section such that more fishermen were chosen in sections where large concentrations of fishermen were fishing such as in sections 20 and 21. Due to time constraints and the difficulty in reaching some communities it was not always possible to spread the coverage as had been anticipated. Nevertheless, cluster sampling was chosen over the earlier systematic design to reduce the problems associated with uneven distribution of capelin, marketing problems, and having an unknown percentage of fishermen who did not fish capelin in any one year. These problems tended to influence the sampling design of the 1981 survey where spotty occurrences of capelin resulted in no or little data from a chosen section when other sections in an area had capelin, differences in standards among plants resulted in higher discarding in some sections than in others, and year to year differences in how many licenced capelin fishermen did not fish lead to a reduction in sample size.

The 1983 survey was similar to the 1982 format. New fishermen were added to replace those who were no longer fishing capelin or were no longer completing usable logbooks.

RESULTS

Survey Response

The return rate of logbooks indicated that a large number of fishermen have to be surveyed to obtain sufficient logbooks back (Table 2). This stems from an unpredictable number of fishermen who do not participate in the fishery due to a variety of reasons (sometimes as many as 30%) and to a number of fishermen who do not fill out logbooks even though they had landings as reported by Statistics Branch. Neither result was unexpected. The difficulty lies in anticipating and compensating for this loss of information. At present we oversample as time and resources permit and replace fishermen who do not fill out logbooks or who do not fish capelin on a regular basis with other

fishermen. Thus our survey list is composed of a core (greater than 50%) of fishermen who have been participating since 1981 and a more dynamic group which changes from year to year. As expected, the quality of the records has improved with experience.

Subsampling fishermen by landings has been relatively successful. Again problems due to inconsistent fishing activities seemed to be the major source of undersampling in our survey. Based upon the total landings in 1982 in Div. 3L (Table 3), we had chosen sufficient numbers of fixed gear fishermen per section for 1983 to meet the criteria of 20% of total landings per dominant gear type where landings were at least 10 mt. However, an examination of the ratio of landings of fishermen in our 1983 survey versus total landings indicated that we were only partly successful (Table 3). In sections with the highest landings (eg. 12, 17, 18, 21, and 22) the sampling criterion was met, but in other sections it was not. Table 3 illustrates some of the problems associated with this kind of survey. A comparison of total landings by section in 1982 and in 1983 demonstrates that substantial changes in the amount landed and in gear type fished have occurred between these two years. Obviously a sampling scheme predicated on 1982 conditions did not hold for 1983 at least for sections (eg. 10, 11, 25, and 26) where landings fluctuated widely and a shift from beach seines to capelin traps has occurred. To this must be added a consideration for fishermen who did not fish in some years and others who did not fill out logbooks (Table 2). Thus our survey design while adequately sampling in areas of high landings, still requires considerable effort to allow for changes from year to year to maintain good sampling in sections where landings are inconsistent. It may be reasonable to assume that our sampling level in areas where the fishery varies considerably from year to year may not achieve the criteria that were initially set in 1982.

Discarding

Quantitative estimates of discarding are practically nonexistent for the fixed gear fishery except via a hail system and for purse seiners dependent on commercial logbooks returned to the Statistics Branch. Yet discarding of capelin remains a significant problem for the capelin fishery (Anon. 1982b). Discarding in this report is defined as capelin which are caught but not sold including capelin which are caught and released at sea and those which are brought aboard the vessel and dumped later. For purse seiners (P) and capelin traps (T) there is a similar general trend from a drop in discard levels between 1981 (P : 36.8%; T : 32.6%) and 1982 (P : 20.8%; T : 13.9%) and then an increase to high levels in 1983 (P : 79.8%; T : 40.8%) (Tables 4 and 5). Discarding from beach seines also increased from 1982 (23.6%) to 1983 (130.7%) and was low in 1981 (15.7%) (Table 6). This low 1981 value may be attributed to a small sample size of 4. Dumping was thought to be low in 1981 (Nakashima and Harnum 1982) and estimated to be low in 1982 (Nakashima and Harnum 1983). The amount of capelin dumped in 1983 was higher for both purse seines and traps (unpublished data). The trends in discarding and dumping in particular reflect the general views that have emerged during the past three years. Data from logbooks completed by observers aboard some purse seine vessels in 1982 substantiated our discard estimates derived from purse seine logbooks

(Nakashima and Harnum 1983). These estimates for discarding represent the only documented ones available for the fishery.

Data from the research logbook also allowed us to put into perspective the various reasons fishermen gave for discarding capelin. From 1981 to 1983 the predominant reasons for discarding by purse seine fishermen have been the presence of redfeed in capelin followed by a low percentage of females (Nakashima and Harnum 1982, 1983). The problem of redfeed has increased each year with it completely dominating the mobile inshore fishery in 1983 accounting for about 70% of reported discards. In all three years, the major problem for trap fishermen has been a low percentage of females in the catch. Other reasons are secondary to it and vary from year to year. In both 1981 and 1983 trap fishermen had trouble selling their catch to some fish plants. In addition small females were problematic in 1981 (Nakashima and Harnum 1982). Sorting males from trap catches relates to the concern over low percentage of females which was often given as a reason for discarding in 1982 (Nakashima and Harnum 1983). Along with low percentages of females and market problems, incidence of redfeed was noted by trap fishermen as a reason for discarding 20% of the time in 1983. As with amounts of discards, the reported reasons for discarding given in the logbooks have enabled us to priorize the problems which are associated with each gear type in catching and landing capelin suitable for the roe market.

By-catch

A major concern following the 1981 capelin fishery was the amount of cod by-catch in the capelin trap fisnery (Anon. 1982b). Data from the logbooks from capelin trap fishermen suggested that this by-catch was of nominal concern. In 1981 5.8 mt of cod were reported caught in 41 traps which increased to 60.0 mt in 81 traps in 1982 (Nakashima and Harnum 1983). In 1983, 17.7 mt of cod were reported caught in 71 traps (Table 5). In all three years the cod by-catch represented less than 1.5% of the reported logbook landings. Thus, from our logbook data, the by-catch of cod was small.

Other species (eg. flounder, salmon, squid, etc.) were also caught but reportedly in extremely small numbers. Of note is the presence of small herring captured in capelin traps in 1983 which may represent a potentially good 1982 year-class of herring (Wheeler and Winters 1983). Logbooks can provide ancillary information on other commercial species which may be of value in evaluating their regions of overlap in distribution with capelin during the capelin fishery.

Catch/Effort Analysis

Catch/effort statistics derived from research logbooks for all measures of effort for capelin traps (Table 7) and purse seiners (Table 8) demonstrated the same trend from 1981 to 1983 which corresponded to the trend in mature biomass of capelin in Div. 3L during the same time period (Anon. 1981, 1982a). The first columns in Tables 7 and 8 utilized reported landings rather than catch, whereas the columns with landings and discards were more indicative of

the catch. Regardless of which statistic was used as catch, catch/effort was low in 1981 and was much higher in 1982 and 1983. In fact, the catch/effort esimates were very similar in 1982 and 1983. This was indicative of the pattern of a lower spawning biomass estimate in 1981 (Anon. 1981) and higher and almost equivalent estimates for 1982 and 1983 (Anon. 1982a). The 1982 and 1983 estimates are projections from a 1981 hydroacoustic survey. Egg deposition in Bryants Cove resulting from spawning in 1981-83 followed the same trend, i.e. egg deposition in 1982 was slightly higher than in 1983 and both years were much higher than in 1981 (K. T. Frank, BIO, Dartmouth; C. Taggart, McGill University, pers. comm). As expected from the earlier discussion on discarding, the catch/effort index which employed landings plus discard data for purse seines and traps (Tables 7 and 8) revealed that catch rates were slightly higher in 1983 than in 1982, however, landings alone did not show any appreciable change. This was attributed to the higher estimate of discarding which occurred in 1983.

A comparison of catch/effort indices between research logbook data and the data available from Statistics Branch indicated that there were differences between the two data sets. For traps it was assumed that each purchase slip represented one haul. Purchase slip estimates of catch/haul using this assumption indicated that catch rates of capelin traps were similar in 1981 and 1982 and increased in 1983 (Table 7). This was in contrast to the logbook estimates of catch/day and catch/haul (Table 7) and to the trends in mature biomass during 1981-83. Similarly catch/effort derived from Statistics Branch logbooks for purse seiners did not follow the same pattern noted for research logbooks and mature biomass in Div. 3L (Table 8). However, one may consider that the catch rates for 1981 were probably not representative since they were from only three logbooks of which two vessels were fishing exclusively in St. Mary's Bay where catches were not very high compared to other areas in Div. 3L. The correspondence between the 1982 and 1983 catch rates for both research and Statistics logbooks suggests that in these years there was little difference between the two data sources. Because of low sample sizes in 1981 for Statistics logbooks, it is not known whether the Statistics logbook data would have followed the mature biomass trends as did the research logbook data from 1981 to 1983.

Thus both capelin trap and purse seine catch rates estimated from research logbooks reflected mature biomass trends from 1981 to 1983 in Div. 3L.

DISCUSSION

It is clear from the foregoing analysis of the research logbook records and a comparison with the limited data available from Statistics Branch that an analysis of the inshore capelin fishery would be woefully incomplete without the support of logbook data and personal contact with fishermen. The logbook data from the fixed gear fishery is especially valuable since no adequate measure of effort can be derived from purchase slip data alone (Table 7). The use of Statistics Branch logbooks could supplement our research logbook survey of purse seine fishermen since the data seem comparable for 1982 and 1983 (Table 8), however, this would only hold if sufficient logbooks are returned. In 1981 only three logbooks were received which were not indicative of the

mobile fishery as a whole. In 1982 and 1983, the majority of logbooks received by Statistics Branch were from fishermen who had been completing the research logbooks. This suggests that personal contact with fishermen and directed efforts to collect logbooks have produced a positive feedback in better collecting (or at least more) of data than by mailing logbooks to fishermen along with their licences. Should the rate of return of purse seine logbooks remain high, it will be possible for us to reduce this aspect of our survey and allow us to concentrate on the fixed gear fishery which appears to be changing both in increased activity and changes in gear type from beach seines to capelin traps (Table 3). Moreover we have been expanding our coverage of the Div. 3K and 3Ps fixed gear capelin fisheries.

The time-absorbing method of scrutinizing purchase slips from the fixed gear fishery for vessels less than 35' in length has pointed out several inadequacies with the present system which in concert make some of the data suspect and difficult to access. The major problem was the lack of sufficient computerized data from purchase slips (namely CFV number or some other identifier; quantity of gear fished) so that purchase slip information from individual fishermen could be retrieved and collated for catch/effort analysis. Generally the data being stored represents landed product with the hail system accounting for dumped capelin. Some landings were not recorded as being landed in the proper statistical area due to the practice of trucking capelin all over the island and to purse seiners moving between areas. The sharing of landings and the practice of giving away or receiving excess catch from another fisherman reduced the reliability of the landings attributed to a vessel or individual from purchase slip data. There have been instances each year of missing purchase slips for some fishermen which lowers their reported landings. Without logbook data there would have been no quantitative estimates (however biased they may be) of discarding and by-catch and no ancillary information on capelin distribution and behaviour, on capelin fishing practices, and on the reasons for discarding capelin. These problems were further aggravated by incomplete lists of fishing gear for capelin fishermen and increases in amount of gear or changes in gear being used which were unknown to us except when we were in the field contacting fishermen on our survey. These latter changes presented problems in maintaining sample sizes for the logbook survey.

It may be argued that such inconsistences in the data may not be substantial enough to warrant the effort required to undertake a logbook survey. However, the results from our survey from 1981 to 1983 presented herein and the knowledge and personal contact gained from our efforts would suggest otherwise.

Logbook data from fishermen provide one source of information on a variable and volatile fishery. The design of the survey has changed from a systematic one where all fishermen in a small area were surveyed to a cluster sampling scheme where the number of fishermen contacted was somewhat representative of the landings in a section. As demonstrated earlier (Table 3) some deficiencies in sampling may have occurred due to the number of fishermen who did not fish capelin or did not choose to fill out a logbook in any one year. At least the coverage in the sections where landings were highest remained sufficient according to our criteria. The coverage of the mobile fishery has been very good representing well in excess of 25% of the landings

and 25% of the number of purse seine vessels in any given year. The correspondence between the research and Statistics logbooks in 1982 and 1983 indicated that we may be able to reduce the number of purse seine fishermen in our survey without diminishing the quality of that data.

Logbook data are subject to and highly dependent on the reliability of fishermen to maintain accurate records. In 1982 a project of limited scale with observers aboard some purse seine vessels indicated that logbook data were consistent between these vessels and those without observers (Nakashima and Harnum 1983). It would be impractical and costly to carry out a larger program on an annual basis. At present we rely on our personal contact with fishermen and on receiving enough logbooks from many communities to overcome any problems in inaccurate records. Logbook landings are generally higher than those recorded on purchase slips (Tables 4, 5 and 6), however, they do not appear to be that much higher. Such errors can be expected when fishermen are making estimates of catch either at sea or after the day has ended.

For the moment, there is no alternative to using logbooks for catch/effort data in the capelin fishery. Attempts to provide independent estimates of relative abundance notwithstanding, data are available from the commercial fishery which covers a large area with a high sampling rate and should be considered when discussing trends in fishing and relative abundance. A comparison of catch/effort trends from logbook data from 1981-83 (Tables 7 and 8) with abundance estimates derived from analytical models and hydroacoustic surveys and the examination of trends in discarding and by-catch problems suggest that logbook data are a reflection of these parameters as it influences the inshore capelin fishery.

Despite the controversy over what purse seine catch rates represent (see Powles 1981) and the rather restricted number of data points (3 years), there is merit in continuing to monitor these indices since they represent the sole source of commercial catch rate indices for the capelin fishery. Three years is hardly enough time to adequately judge the catch/effort indices which have been derived for the Div. 3L survey. However, the direction in trends between these indices and mature biomass estimates for the stock appear promising.

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Table 1. Capelin landings (mt) by area in Div. 3L, 1974-83.

Year	Bonavista Bay	Trinity Bay	Conception Bay	Southern Shore	Trepassey and St. Mary's bays	Div. 3L Total
1974	1,288	2,287	310	791	186	4,862
1975	150	960	463	646	13	2,232
1976	98	4,954	2,062	645	54	7,813
1977	127	4,818	3,744	7	10	8,706
1978	351	3,387	3,574	117	10	7,439
1979	762	3,300	8,070	118	32	12,282
1980	1,711	5,029	7,090	324	361	14,515
1981	3,834	9,398	10,302	67	796	24,397
1982	3,664	10,589	11,606	368	1,123	27,350
1983	3,199	9,015	11,770	8	1,000	24,992

Table 2. Responses from a logbook survey conducted in Div. 3L, 1981-83.

	No. contacted	No. logbooks returned	Did not fish capelin	Logbooks not returned
Purse seine				
1981	70 (7)*	37 (44)	11	22
1982	91 (7)*	54 (61)	10	27
1983	75 (9)*	37 (46)	7	31
Fixed gear				
1981	119	74	13	32
1982	136	81	36	19
1983	131	66	38	27

* fishermen who reside in Div. 3K but fished in Div. 3L. These are added to the 'No. logbooks returned' column in parenthesis.

Table. 3. Capelin landings by fishermen in the survey (FSL) as a percentage of the 1983 total landings (TL) per statistical section per gear type. The 1982 landings are shown to illustrate the changes between 1982 and 1983.

	Capelin trap			Beach seine		
Stat. Sect.	1982 total landings (mt)	1983 total landings (mt)	% FSL / TL	1982 total landings (mt)	1983 total landings (mt)	% FSL / TL
10	0	226.9	0	9.5	8.2	0
11	0	139.2	0	2.4	34.8	0
12	97.2	157.9	3.2	33.1	47.1	20.4
13	42.2	0	0	124.0	29.2	0
14	0	0.2	0	5.7	1.6	0
15	7.6	0.5	0	5.8	7.6	0
16	44.7	28.0	12.0	413.9	363.9	22.7
17	1525.5	3593.1	20.7	100.0	180.9	0
18	793.7	896.9	46.8	24.7	67.3	23.0
19	124.1	45.5	0	0	12.4	0
20	0.8	24.4	0	2.8	15.6	0
21	3547.8	3095.2	30.8	24.8	20.1	0
22	2367.7	2108.2	71.1	127.7	110.6	80.0
23	3.2	34.4	0	2.0	4.3	0
24	74.1	3.4	0	0.3	21.2	0
25	91.8	0.5	100.0	0	0	0
26	145.7	1.2	33.3	0	3.3	0
27	0	0	0	0.4	0.1	0
28	8.9	11.6	79.3	58.1	5.4	0

Table 4. Purse seine landings (mt) and discards (mt) extracted from logbooks and purchase slips for the same fishermen in Div. 3L.

Year	Landings by purchase slip	Landings by logbook	Discards by logbook	No. of Fishermen
1981	3398.5	4363.5	1604.3	44
1982	9707.9	10948.3	2309.8	60
1983	5194.4	5408.8	4318.2	46

Table 5. Capelin trap landings (mt), discards (mt), and cod by-catch (mt) extracted from logbooks and purchase slips for the same fishermen in Div. 3L.

Year	Landings by purchase slip	Landings by logbook	Discards by logbook	Cod By-catch	No. of traps
1981	1114.5	1281.0	417.7	5.8	41
1982	2831.2	4366.5	605.2	60.4	81
1983	2648.1	3038.6	1239.4	17.7	71

Table 6. Total beach seine landings (mt) and discards (mt) extracted from logbooks and purchase slips for the same fishermen in Div. 3L.

Year	Landings by purchase slip	Landings by logbook	Discards by logbook	No. of fishermen
1981	24.9	47.8	7.5	4
1982	145.6	239.0	56.4	15
1983	118.3	151.6	198.1	14

Table 7. Catch/effort of capelin traps utilizing research logbook and purchase slip data.

	Logbook landings (mt)		Logbook landings & discards (mt)		Purchase slip landings (mt)
Year	C/day	C/haul	C/day	C/haul	C/haul
1981	2.1	2.1	2.7	2.7	2.9
1982	3.3	2.7	3.7	3.0	3.3
1983	3.1	2.8	4.3	3.8	4.6

Table 8. Comparison of catch/effort data in Div. 3L from purse seine logbooks completed for Fisheries Research Branch (RL) and for Statistics Branch (SL), 1981-83.

	RL landings (mt)		RL landings & discards (mt)		SL landings (mt)		SL landings & discards (mt)	
Year	C/day	C/haul	C/day	C/haul	C/day	C/haul	C/day	C/haul
1981	6.9	3.4	9.4	5.3	13.7	8.6	17.5	11.0
1982	13.5	6.7	16.4	8.1	12.6	6.8	15.7	8.5
1983	10.6	5.4	19.1	9.8	10.1	5.2	16.6	8.5

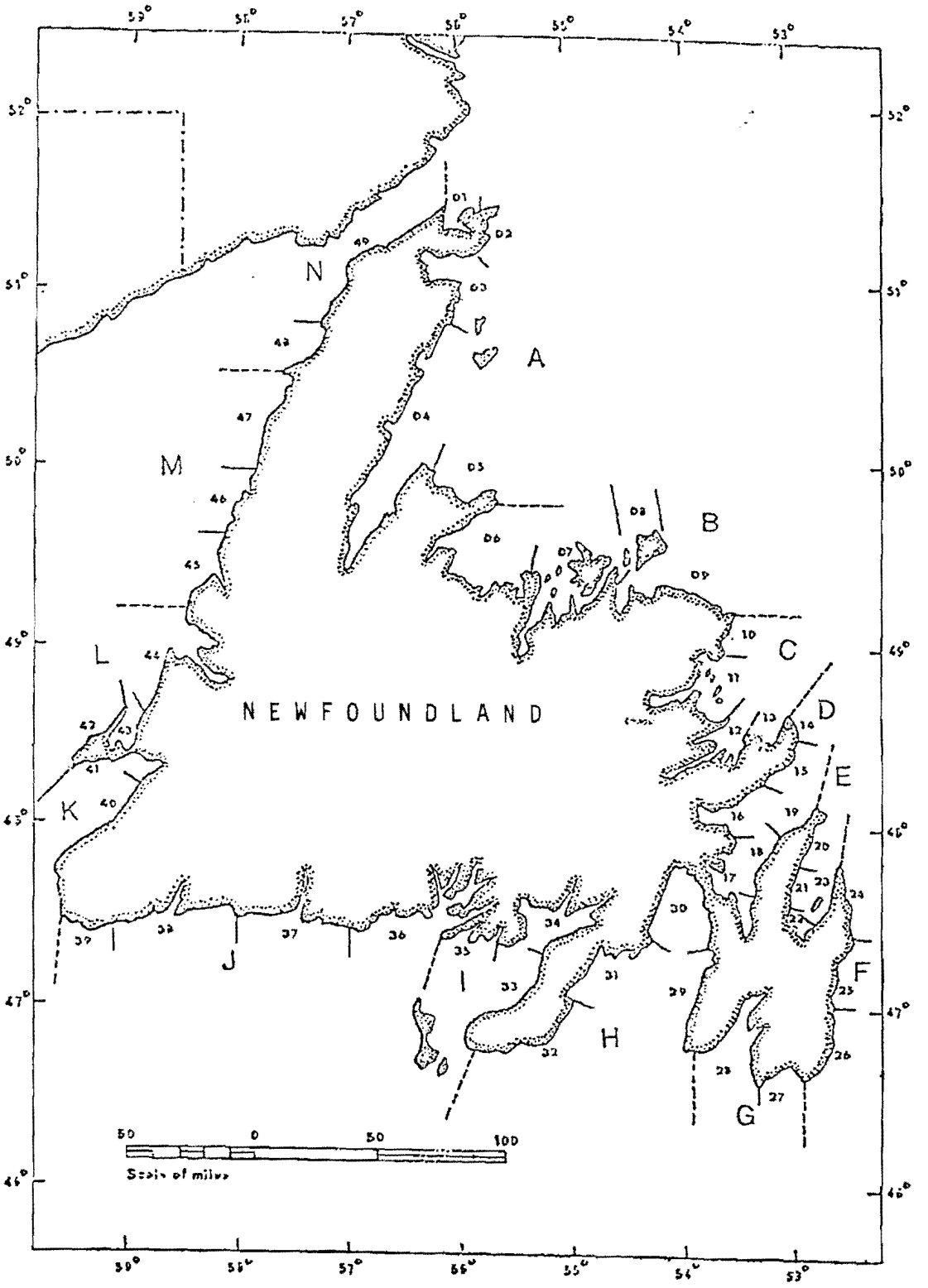

Fig. 1. Statistical areas (A = White Bay, B = Notre Dame Bay, C = Bonavista Bay, D = Trinity Bay, E = Conception Bay, F = Southern Shore, G = St. Mary's and Trepassey bays) and sections (numeric) in the Newfoundland region.