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Summary of a Logbook Survey of the 1982 Inshore Capelin Fishery in Division 3KL

by

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ABSTRACT

Logbook information was analyzed to examine trends in the inshore capelin fishery in 1982. Considering all fishermen who fished capelin in 1982 and had research logbooks, 68% of the purse seine fishermen and 81% of the fixed gear fishermen returned their logbooks. Discarding was less than in 1981. Cod by-catch was 1.4% of capelin landings in traps in 1982. Purse seine landings per day were higher than in 1981 but landings per set were unchanged between 1981 and 1982. Catch/effort for capelin traps was higher than in 1981 for Conception Bay but similar in Trinity Bay. Catch/effort for Southern Shore traps was much higher than in 1981 but remained lower than catch/effort values for Conception and Trinity Bays.

INTRODUCTION

The inshore capelin fishery in Newfoundland is prosecuted by fixed gear (traps, beach seines) and mobile gear (purse seine) fishermen. The fishery is directed towards supplying a Japanese roe market for frozen female capelin with the majority of landings occurring in Div. 3L (Table 1).

This report presents data collected from the second year of a logbook survey which was initiated in 1981 (Nakashima and Harnum; 1982). The information from these logbooks was analyzed to present data on fishing effort, levels of discarding, and amounts of by-catch. Data from observers placed aboard six purse seiners were also examined and compared to information from all purse seine logbooks. One observer divided his time between two vessels.

MATERIALS AND METHODS

In 1982, logbooks were distributed to the fishermen who had received logbooks in 1981 and also to additional mobile and fixed gear fishermen in areas where our coverage was poor in 1981. As shown in Tables 2 and 3, 113 logbooks were given to purse seiners and 136 to fixed gear fishermen. As reported in Nakashima and Harnum (1982), fixed gear fishermen were contacted in statistical sections 15, 16, and 17 in Trinity Bay and in statistical section 22 in Conception Bay (Fig. 1). Logbooks were either mailed back or picked up in the fall of 1982. The choice of area for direct contact was based upon the number of new fishermen there.

Purchase slips provided by Economics Branch were used to compile landings for fishermen who participated in the survey as a way of validating logbook entries.

In 1982, five observers were aboard commercial purse seiners which fished mainly in Div. 3L. The observers collected data on lengths and on sex ratios (Nakashima; 1983) and to some extent validated logbook entries.

RESULTS

The response to the survey has improved from last year with logbook return rates of 68% for purse seine and 81% for fixed gear fishermen. These calculations were based upon the formula:

$$\text{return rate} = \frac{\text{logbooks returned}}{\text{no. contacted - no. did not fish capelin}}$$

using the values in Tables 2 and 3. The high percentage of logbooks from the fixed gear sector is especially valuable since no other effort data exists for capelin traps.

Records from logbooks in 1982 were of much higher quality than in 1981. The information in three purse seine logbooks was not used and two others were used only partially in this analysis. For the fixed gear fishery, five logbooks for capelin traps were rejected due to inability to ascertain fishing effort and/or discarding. This represents a significant increase in good logbooks from 1981 and is attributed to more experience in completing records and to more emphasis in explaining how the logbooks should be kept. Landings reported in logbooks for purse seines (Table 4), traps (Table 5), and beach seines (Table 6) continue to be higher than those recorded on purchase slips. These higher landings are attributed to fishermen estimating their catches at sea and to difficulties in interpreting and collecting the purchase slips. Some of the major problems are related to catches assigned to wrong areas, fishermen sharing catches, and missing purchase slips. Landings from beach seines are presented (Table 6) but catch/effort data were not compiled due to the paucity of landings and knowledge that most fishermen in Trinity and Conception Bays used traps rather than beach seines to catch capelin.

Discarding

Discarding in 1982 which was estimated from logbook entries appeared to be much reduced from 1981. Discards expressed as a % of landings was 26% (265,129/1,036,841 x 100) for purse seines in Div. 3K (Table 4), 21% (2,309,795/11,088,401 x 100) for purse seines in Div. 3L (Table 4), 14% (605,183/4,366,536 x 100) for traps in Div. 3L (Table 5), and 24% (56,363/239,002 x 100) for beach seines in Div. 3L (Table 6). These compared to 37% for purse seines and 33% for traps in 1981 (Nakashima and Harnum; 1982). The majority of capelin discarded by all gears was reported as released alive. Only 3% of capelin discarded in Div. 3K by purse seiners was dumped and 4% was dumped by purse seiners in Div. 3L. This is somewhat substantiated by the observer data which indicated that purse seiners with the observers dumped only 2% and the remainder of the discards were released alive. Approximately 27% of discards from the trap fishermen and 86% from beach seine fishermen were dumped. These were predominantly males which were picked out of the catches to raise the female percentages in the landings. As in the earlier report (Nakashima and Harnum; 1982), discards refer to all capelin caught but not landed, whereas dumped capelin are only those which are dead. The detailed information provided by fishermen this year enabled us to differentiate known capelin which were released alive and those which were dumped. Although the data were not available in 1981, it is probable that dumping was greatly reduced in 1982 compared to 1981.

The reasons for discarding capelin were numerous. The most frequently reported for traps was low percentages of females followed by picking males out of the catch (Table 7). Problems with the presence of small females and inability to sell to the plants were not as prevalent in 1982 as in 1981. For purse seiners, redfeed was the dominant problem followed by low percentages of females in the catch (Table 7). Redfeed was more of a problem for purse seiners in 1982 than in 1981 as evidenced by the higher percentage of capelin which was discarded due to redfeed levels than reported in 1981.

Catch/effort

The effort data reported in logbooks in 1982 were improved from 1981. One of the problems in 1981 was the inability to determine the total number of searching days for purse seiners and the total number of days capelin traps were fishing. In 1982 fishermen were requested to note the dates when traps were placed in and taken out of the water and the date when searching for capelin began and ended. Thus the effort data from the logbooks in 1982 for both purse seines and traps should be representative of the effort by the entire fishery.

In 1982 we received logbooks from 61 purse seine fishermen which could be used for catch/effort analysis in Div. 3KL (Table 8a). These fishermen on average spent 14.1 days searching for capelin and made 27.4 sets per vessel. Only three purse seine fishermen fished entirely in Div. 3K while five others fished in Div. 3L and 3K. For Div. 3K eight purse

seiners spent 8.4 days searching and made 13.6 sets while for Div. 3L 58 seiners searched for a mean of 13.7 days and computed 26.9 sets. These estimates are less than the 16.4 searching days and 30.4 sets per vessel calculated in 1981 (Nakashima and Harnum; 1982). The apparent lower effort per vessel in 1982 may be attributed to an early closure of the purse seine fishery on June 29, 1982, to the inclusion of several small purse seiners which did not expend much effort in the fishery, and to an increase in the number of purse seiners participating in the capelin fishery in 1982.

From Table 8b, traps in Trinity Bay were fished for 13.3 days and were checked for capelin 16.7 times; traps in Conception Bay were fished for 18.6 days and checked 23.5 times; and those on the Southern Shore were fished for 13.0 days and checked 12.5 times. In comparison to 1981 Trinity Bay traps were fished for more days and checked more times in 1982 (1981: fished 9.4 days; checked 10.9 times), whereas Conception Bay and Southern Shore traps were fished the same number of days (1981: 17.3 and 15.0 days respectively) but were checked more often (1981: 19.6 and 8.8 times respectively) in 1982. As with the purse seine data in 1981, the 1981 trap effort data were probably higher than the values reported by Nakashima and Harnum (1982) due to problems in determining when the traps were placed in the water in 1981.

By-catch

Cod by-catch in 1982 for 81 traps in Div. 3L was reported as 60,403 kg which represented 1.4% of the total reported logbook landings (Table 5). This is an increase from the 5774 kg caught in 41 traps in 1981 which was 0.5% of the logbook landings (Nakashima and Harnum; 1982). While the by-catch is higher in 1982 it still is a small amount compared to the total capelin landings.

Observer data

Logbooks from five purse seiners which had observers aboard in 1982 fished an average of 19.2 days and made 46.8 sets. Discarding represented 28.9% of their total logbook landings. These statistics are higher than the averages given earlier for 61 seiners in Div. 3KL, however considering other factors this comparison suggests that logbook reports in general are fairly reasonable. The five vessels which had observers caught 14% of all the logbook landings reported by 61 seiners. Also one vessel caught more capelin per set and fished more days than any other vessel in the fleet which biased the averages upward. Finally as mentioned earlier all purse seiners were included in the data analysis without regard to size of vessel, size of purse seine, or years of experience in the fishery. Taking into account these considerations there were no serious differences in effort data or reported catches and discards between the seiners with observers and all those seiners which returned logbooks. Thus we have assumed that the logbook information from purse seine logbooks were representative of the fishing activity of the fleet as a whole in 1982.

DISCUSSION

Data from the logbooks indicated that discarding rates had declined from 1981. The presence of redfeed in capelin and low percentages of females were the predominant reasons for discarding by purse seiners while trap fishermen discarded capelin due to low percentages of females and from picking males from catches. Cod by-catch increased to 1.4% in 1982 from 0.5% in 1981. Purse seine landings per day were higher in 1982 than in 1981, however landings per set were not substantially different between years. Capelin trap catch/effort was slightly higher per check and much higher per fishing day in Conception Bay in 1982 over 1981 but was not very different in Trinity Bay between years. Catch/effort calculated from logbooks from the Southern Shore was considerably higher in 1982 but remained less than those for Trinity and Conception Bays. These comparisons especially for trap data must be tempered with having better effort data in 1982 than in 1981. In 1982 there was a concerted effort to have fishermen note all the fishing days and searching days. Thus, the 1982 data are more representative of total fishing activity than in 1981. The latter probably represented a minimum level of effort biasing the catch/effort data upwards.

The results from the logbook analysis are predicated on the assumption that the entries are reasonably accurate. The validity of the information in logbooks can be verified somewhat by comparing logbook landings to landings from purchase slips. The former were consistently higher than the purchase slip information. Landings from purse seine logbooks in Div. 3K were 12% higher while those in Div. 3L were 14% more than landings on purchase slips (Table 4).

This is a slight decline from the 20% difference in 1981. Landings from trap and beach seine logbooks were respectively 54% and 64% greater than those from purchase slip information (Table 5). This was significantly greater than the 13% difference for capelin traps calculated in 1981. While some variation between the two data sources may be expected due to recording errors, the higher value of 54% for traps in 1982 suggests that there are some important problems to consider when dealing with purchase slip data. Two of these were mentioned earlier. Both missing purchase slips and catches shared between fishermen may have been the major factors contributing to the above discrepancy. The purse seine data were substantiated to some degree by having observers on five purse seiners. These data were presented earlier and implied that data from purse seiners with observers were similar to data from the purse seine logbook survey in general.

The considerable time and effort employed in 1982 to improve the quality of the information in logbooks seemed to have been effective. Most of the fishermen provided detailed accounts of discarding, especially pertaining to the reasons for discarding and whether the discards were released alive or dumped. The effort data were greatly improved from 1981. In preparation for the 1982 logbook survey, instructions were made more concise, more time was taken to explain to fishermen how to record data and why the data were required, and fishermen were carefully selected to improve the coverage in the major capelin fishing areas. The fishermen who completed logbooks in 1982 should provide a solid basis for a continuation of annual estimates of catch/effort, discarding, and by-catches.

In 1983, the program was expanded to include beach seine fishermen in Div. 3K and fixed gear fishermen in Div. 3Ps. All fishermen who did not respond in 1982 or have not fished capelin in the last two years were not included in the 1983 survey.

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REFERENCES

Nakashima, B. S. 1983. Differences in mean lengths and percentages of females in capelin schools. NAFO SCR Doc. 83/VI/46, Ser. No. N704.

Nakashima, B. S., and R. W. Harnum. 1982. Summary of a logbook survey of the 1981 inshore capelin fishery in Division 3KL. NAFO SCR. Doc. 82/VI/18, Ser. No. N506, 6 p.

Table 1. Capelin landings (mt) by area, 1974-82.

	Division 3L						
Year	Bonavista Bay	Trinity Bay	Conception Bay	Southern Shore	Trepassey and St. Mary's bays	Div. 3L Total	Div. 3K Total
1974	1,288	2,287	310	791	186	4,862	1,031
1975	150	960	463	646	13	2,232	751
1976	98	4,954	2,062	645	54	7,813	1,676
1977	127	4,818	3,744	7	10	8,706	2,136
1978	351	3,387	3,574	117	10	7,439	2,422
1979	762	3,300	8,070	118	32	12,282	671
1980	1,711	5,029	7,090	324	361	14,515	1,354
1981	3,834	9,398	10,302	67	796	24,397	1,848
1982	3,664	10,589	11,606	368	1,123	27,350	3,896

Table 2. Results of a logbook survey of purse seiners from Div. 3K and 3L, 1982.

Area of residence	No. contacted	Logbook returned	Logbook not filled out	Did not fish capelin
White Bay	7	3	2	2
Notre Dame Bay	15	11	3	1
Bonavista Bay	17	11	3	3
Trinity Bay	47	26	16	5
Conception Bay	21	13	7	1
St. Mary's and Trepassey bays	6	4	1	1
Total	113	68	32	13

Table 3. Results of a logbook survey of fixed gear fishermen from Div. 3L, 1982.

Area of residence	No. contacted	Logbook returned	Logbook not filled out	Did not fish capelin
Bonavista Bay	17	6	0	11
Trinity Bay	52	31	8	13
Conception Bay	52	36	9	7
Southern Shore	15	8	2	5
Total	136	81	19	36

Table 4. Total purse seine landings (kg) in 1982 extracted from logbooks and from purchase slips in Div. 3K and 3L.

Area	Landings by logbook	Discards by logbook	Landings by purchase slip	No. of fishermen
White Bay	109,318	77,112	282,036	3
Notre Dame Bay	927,523	188,017	643,194	10
Total Div. 3K	1,036,841	265,129	925,230	
Bonavista Bay	2,637,260	82,691	2,562,074	22
Trinity Bay	3,923,591	848,913	3,591,599	34
Conception Bay	3,893,602	1,207,136	3,117,071	34
St. Mary's Bay	633,948	171,055	497,786	4
Total Div. 3L	11,088,401	2,309,795	9,768,530	

Table 5. Total capelin trap landings (kg) in 1982 extracted from logbooks and from purchase slips.

Area	Landings by logbook	Discards by logbook	Landings by purchase slip	Cod by-catch	No. of fishermen	No. of traps
Trinity Bay	804,510	258,633	637,714[a,b]	27,247	19	23
Conception Bay	3,345,123	317,438	2,037,256[c,d]	33,051	32	48
Southern Shore	216,903	29,112	156,293[e]	105	9	10
Total	4,366,536	605,183	2,831,163	60,403	60	81

:includes landings from beach seines and traps for 3 fishermen.

:no purchase slip information for 2 fishermen.

:includes landings from beach seines and traps for 1 fisherman.

[d]:no purchase slip information for 2 fishermen.

[e]:no purchase slip information for 1 fisherman.

Table 6. Total beach seine landings (kg) extracted from logbooks and from purchase slips.

Area	Landings by logbook	Discards by logbook	Landings by purchase slip	Cod by-catch	No. of fishermen
Bonavista Bay	57,174	5,443	4,452[a]	0	6
Trinity Bay	157,832	50,013	102,775[b]	0	7
Conception Bay	23,996	907	38,379[c]	0	2
Total	239,002	56,363	145,606	0	15

[a]:no purchase slip information for 4 fishermen.

[b]:includes landings from traps and beach seines for 2 fishermen.

[c]:includes landings from traps and beach seines for 1 fisherman.

Table 7. The percent contribution by weight for reasons for discarding capelin in 1982.

Locality	Redfeed	Low % of females	Small females	Females picked out	Spawned out females	Plants blocked no sale	Misc.	Not given
Traps								
Trinity Bay	5	60	-	23	1	5	1	5
Conception Bay	4	54	-	16	-	3	22	1
Southern Shore	-	84	3	5	-	3	5	-
Purse seines								
White Bay	100	-	-	-	-	-	-	-
Notre Dame Bay	52	32	10	-	6	-	-	-
Bonavista Bay	41	36	-	-	-	-	12	11
Trinity Bay	42	44	2	-	1	-	11	-
Conception Bay	52	35	1	-	-	-	11	1
St. Mary's Bay	12	72	15	-	-	-	-	-

Table 8a. Catch/effort data for purse seines estimated from the 1982 logbook survey.

Locality	No. days fished	No. sets made	Landings per logbook (kg)	Landings and discards per logbook (kg)	No. of purse seiners
Div. 3K	67	109	12,138/day	14,944/day	8
			7,461/set	9,186/set	
Bonavista Bay	157	316	16,798/day	17,325/day	22
			8,346/set	8,607/set	
Trinity Bay	300	536	12,084/day	14,535/day	33
			6,763/set	8,136/set	
Conception Bay	289	622	12,443/day	16,620/day	33
			5,781/set	7,722/set	
St. Mary's Bay	46	87	13,781/day	17,500/day	4
			7,287/set	9,253/set	
Div. 3L	792	1,561	13,248/day	16,021/day	58
			6,722/set	8,129/set	

Table 8b. Catch/effort data for capelin traps estimated from the 1982 logbook survey.

Locality	No. days fished	No. times checked	Landings per logbook (kg)	Landings and discards per logbook (kg)	No. of traps
Trinity Bay	305	384	3,022/day	3,486/day	23
			2,095/check	2,767/check	
Conception Bay	894	1,129	3,742/day	4,097/day	48
			2,963/check	3,244/check	
Southern Shore	130	125	1,668/day	1,892/day	10
			1,735/check	1,968/check	
Div. 3L	1,329	1,638	3,286/day	3,741/day	81
			2,666/check	3,035/check	

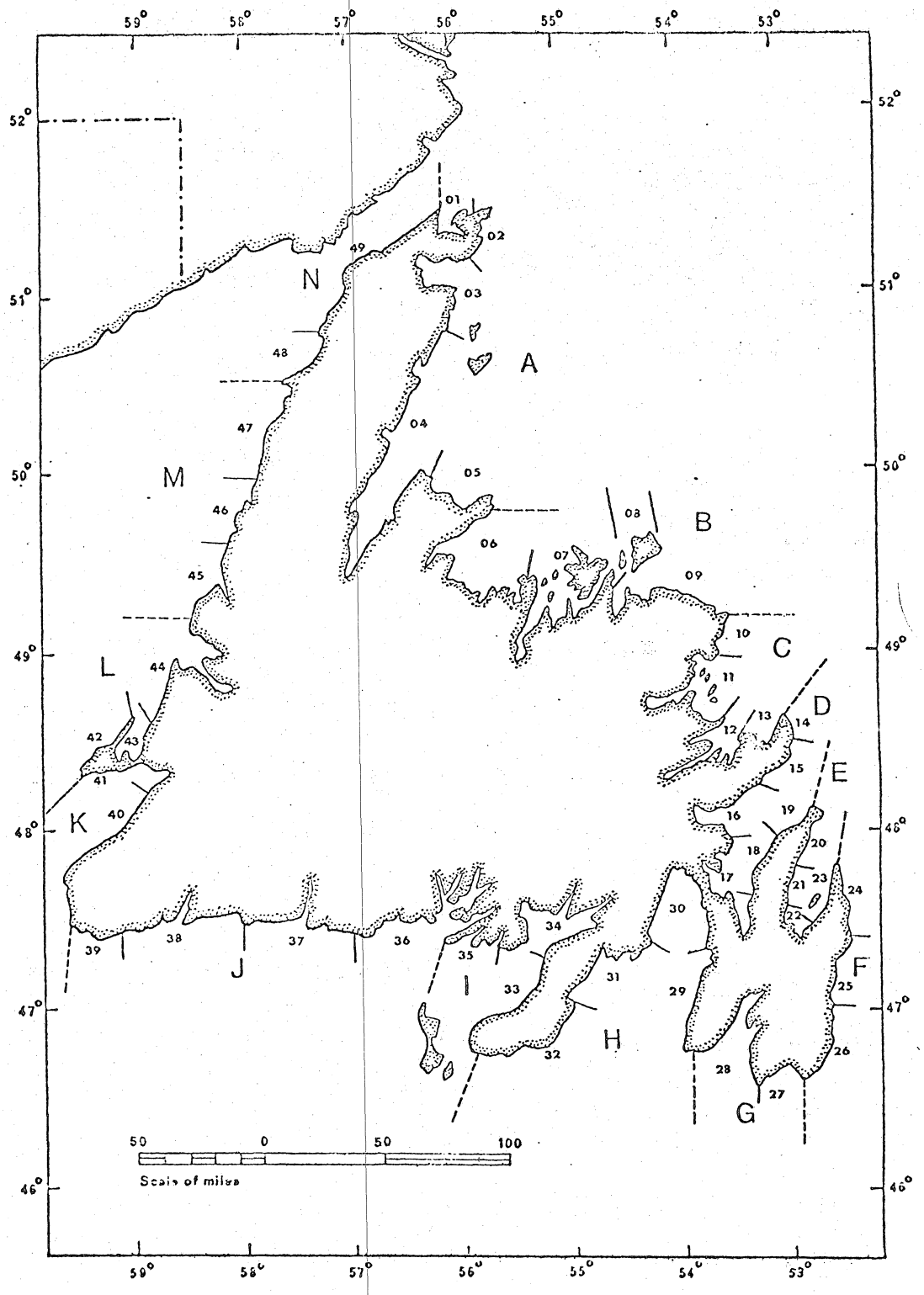

Fig. 1. Statistical areas (A = White Bay, B = Notre Dame Bay, C = Bonavista Bay, D = Trinity Bay, E = Conception Bay, F = Southern Shore, G = St. Mary's and Trepassey bays) and sections (numeric) in the Newfoundland region.