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Summary of the Food Fishery for Cod in NAFO Divisions 2J, 3K 3L and 3Ps in 1993 and 1994

by

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¹La présente série documente les bases scientifiques des évaluations des ressources halieutiques sur la côte atlantique du Canada. Elle traite des problèmes courants selon les échéanciers dictés. Les documents qu'elle contient ne doivent pas être considérés comme des énoncés définitifs sur les sujets traités, mais plutôt comme des rapports d'étape sur les études en cours.

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Abstract

Recreational handlining (later referred to as the food fishery) was permitted in 1993 and 1994 in NAFO Div. 2J, 3K, 3L and 3Ps. No restrictions were placed on season or quantity of fish taken in 1993. During August, estimates of catches by Statistics Branch for the year was 3,671 t in NAFO Div. 2J, 3K and 3L, and 1,176 t in 3Ps. A portion of the 3Ps catch was from commercial handling since 3Ps was not closed until September of 1993. In 1994, the food fishery was restricted to five Friday/Saturday periods in August and September. A comparison of landing figures with estimates from this study suggests a combined catch for 2J, 3K, 3L and 3Ps in the range of 1,000-1,500 t for 1994. In both years, size of fish was similar within bays over time. However, there were differences in average size of fish among bays. Only three bays were sampled in 1993 and detailed comparisons were not possible for that year. In 1994, fish were smaller on average to the north (as far south as Conception Bay), averaging between 42 and 46 cm, mainly 4-6 year olds. For the Southern Shore and south (and including Trinity Bay), the fish averaged between 50 and 54 cm. Size range also increased from north to south, such that very large fish were taken only in St. Mary's Bay (St. Shott's), Placentia Bay and Fortune Bay. It was generally noted that the fish in 1994 were of average condition as opposed to the "slinks" (thin fish) noted in certain areas in 1993. General patterns of catch rates (1994) were similar for the four weekly periods and showed no trend among bays. Catches ranged between 1.5 and 2.5 fish per hour. The best catch rates came from Bonavista and Placentia bays, and the poorest were from Conception Bay, especially on the south side of the bay. This confirmed anecdotal reports of low catch rates from that area.

Résumé

La pêche sportive à la ligne à main (appelée ci-après pêche de subsistance) a été permise en 1993 et en 1994 dans les divisions 2J, 3K, 3L et 3Ps de l'OPANO. Aucune restriction n'a été imposée quant à la saison ou à la quantité de prises en 1993. En août, l'évaluation des prises effectuée par la Direction des statistiques pour l'année se situait à 3 671 t dans les divisions 2J, 3K et 3L de l'OPANO et à 1 176 t dans la sous-division 3Ps. Une partie des captures dans cette dernière sont celles des pêcheurs commerciaux puisque la pêche commerciale n'y a pas été interdite avant septembre 1993. En 1994, la pêche de subsistance a été limitée à cinq vendredis/samedis en août et septembre. Une comparaison des débarquements avec les évaluations de la présente étude montre que les prises combinées, pour 2J, 3K, 3L et 3Ps, devraient se situer entre 1 000 et 1 500 t pour 1994. Au cours des deux années, la taille du poisson était semblable d'une année à l'autre dans chaque baie. Cependant, on a noté des différences de taille moyenne du poisson entre les baies. L'échantillonnage de 1993 ne touchait que trois baies; il n'a donc pas été possible de faire des comparaisons détaillées pour cette année-là. En 1994, le poisson était généralement plus petit dans le nord (jusqu'à la baie de la Conception au sud), mesurant en moyenne entre 42 et 46 cm, la plupart des prises ayant entre 4 et 6 ans. Pour la côte sud et la région du sud (y compris la baie de la Trinité), le poisson mesurait en moyenne entre 50 et 54 cm. La fourchette de tailles a aussi augmenté du nord au sud, de sorte que ce n'est que dans la baie Sainte-Marie (St. Shotts), la baie de Plaisance et la baie de Fortune que de très gros poissons ont été capturés. En général, on a noté que l'état du poisson capturé en 1994 était moyen comparativement aux poissons très maigres observés dans certaines régions en 1993. Le profil général des taux de prises (1994) était semblable pour les quatre périodes hebdomadaires et ne montrait aucune tendance particulière d'une baie à l'autre. Le taux de prises variait entre 1,5 et 2,5 poissons à l'heure, le meilleur taux ayant été celui des baies Bonavista et de Plaisance, et le plus mauvais, celui de la baie de la Conception, surtout du côté sud de la baie. Ces observations ont confirmé les rapports isolés de faibles taux de prises dans cette région.

Introduction

In 1992 and 1993 the commercial fisheries for cod in NAFO Div. 2J, 3K and 3L (1992) and 3Ps (1993) were closed. However, recreational handlining (later referred to as the food fishery) continued to be permitted. Season and allowable catch were not restricted for 1993 but in 1994, based partly on the poor results of the previous season, and to prevent large amounts of fish being taken (as was thought to be the case in 1993), the fishing was limited to five Friday/Saturday periods in August and September. Fishers were allowed a maximum of 10 fish per day. The fishery was closed a week early after September 17 apparently based on the small size and low numbers of fish in the catches.

A requirement of Department of Fisheries and Oceans was that the fishery be closely monitored. As a result, Science Branch in conjunction with Enforcement and some fishers gathered catch, effort, length and age information from all of the areas fished. Although the fishing activity was more restricted than in 1993, monitoring was much more extensive in 1994. This paper summarizes the findings of the sampling program that covered the food fishery on the Atlantic side of Newfoundland (Labrador to Fortune Bay) for both 1993 (limited coverage) and 1994. Catch rates and fish sizes by area are presented and estimates of catch are given for both years.

Methods

Catch and effort (number of cod caught, number of vessels, number of persons fishing per vessel and number of hours fished for selected periods) and fish lengths were collected by Science Br. technical staff, fishery officers and fishers at a variety of locations around the island and the Labrador coast during August 26-27, September 2-3, September 9-10 and September 16-17 (Table 1). Scientific staff also collected otoliths for ageing. Also, many fishers were informally interviewed regarding their view of the fishery.

Determination of landing locations was made by visiting communities and speaking to local people to find where the greatest concentrations of landings were likely to be. For 1994, areas where fish landings were highest in 1993 were targeted for sampling. For 1994, data were collected from 25 selected sites on the Labrador coast, the Northern Peninsula, White Bay, Green Bay, Bonavista Bay, Notre Dame Bay, Trinity Bay, Conception Bay, Southern Shore south of St. John's, Placentia Bay, Fortune Bay and Hermitage Bay plus samples taken at sea (Fig. 1). Sampling effort was limited to Notre Dame Bay, Trinity Bay and the Southern Shore in 1993.

The aim of this project was to obtain sufficient samples from as wide an area as possible to monitor size and age of fish in the catches. In most cases, measurements of total length were obtained from both morning and evening landings. The entire catch of each fisher was measured. Sampling was also done at sea in conjunction with the activities of the fishery officers and fishers, in addition to the sampling effort at various landing sites. Otoliths were collected from a subset of measured fish in each length group.

Information on catch (numbers caught) and effort (numbers of fishers in each observed vessel plus hours fished by that vessel) was taken with each sample. Catch rates were determined by dividing number of cod caught by each person by number of person-hours per vessel. An average catch rate of observed vessels was calculated for each bay.

Total catch of cod in each bay was estimated by integrating information on number of vessels observed during surveillance flyovers with catch and effort data collected from sampled

vessels. The observed weight was obtained by multiplying the number of fish observed or measured by an average weight taken from a length weight relationship for the specific NAFO Division. This yielded a weight estimate for all sampled fish. The maximum weight was calculated by assuming that all fishers caught the maximum 10 fish per day and by multiplying the average fish weight by 10.

A conversion factor to adjust weight of sampled cod to estimated weight for all vessels was derived by adding the number of vessels observed by surveillance overflights that took place during peak periods (7:00-9:30 AM and 5:30-7:00 PM) for both Trinity and Conception Bays. This figure was multiplied by the number of days the fishery was open (eight) to estimate the total number of boats that fished those two bays. This total was divided by the total number of at-sea observations in which the number of fish caught and the number of fishers was recorded to yield an adjustment factor. The number of fish observed per person during the sampling and the maximum number of fish possible, based on daily bag limits of 10 fish, were multiplied by this factor to obtain total numbers.

For NAFO divisions, overflights were done only for Trinity and Conception bays. Therefore, using an average effort was necessary (number of observed vessels) from those two bays to adjust the observed catches from the other bays. For NAFO Div. 3Ps, resource management indicated that 20% of vessels were sampled in Fortune and Placentia bays. Thus, an adjustment factor of five was used. Casual observation of the fishing effort in all bays suggests that these extrapolations were not unreasonable. The figures thus derived were compared to landing information collected by Statistics Branch.

Results

The 1993 Fishery

The recreational (food) fishery was limited to handline. Corresponding with the arrival of fish inshore, the season did not start until August and peaked in mid-September. Only limited sampling was done in 1993 (Table 1). No catch and effort information was collected but an estimate of handline catches by Statistics Branch for the year was 3,671 t for NAFO Div. 2J3KL. The catch in 3Ps was 1,167 t but commercial effort could not be separated from recreational effort for that area. Average size of fish sampled from three bays is summarized in Fig. 2. Size of fish was similar in Notre Dame and Bonavista bays, slightly larger along the Southern Shore and largest in Trinity Bay. The pattern was similar to 1994 as shown in the next section.

The 1994 Fishery

Duration of the 1994 fishery was restricted but the sampling effort was more intense than in 1993. More than 2,900 length samples of up to ten fish were collected from about 25 sites in 1994. Weekly frequencies of the sampled cod are illustrated in Fig. 3. The fishery occurred only during four weekends and within bays, no trends in fish size were apparent during that period. In each bay observed, average size and range of sizes were about the same for each of the two to four weekly fishing periods. The biggest differences among weeks appeared to relate to the different sampling locations. Only in St. Mary's Bay was there a substantial change in average size observed between weeks (Fig. 3h) and this was due to two different sampling locations. St. Shott's, located at the mouth of the bay, yielded fish about 8 cm larger on average than at the head of the bay (Admirals Beach).

However, there were differences in average size of fish among bays. Figure 4 shows the summarized frequency for each bay and Fig. 5 illustrates average size and range trends. Fish were smaller on average to the north (as far south as Conception Bay), averaging between 42 and 46 cm, mainly of 4-6 year olds. For the Southern Shore and south (and including Trinity Bay), the fish averaged between 50 and 54 cm. Size range also increased from north to south, such that very large fish were taken only in St. Mary's Bay (St. Shott's), Placentia Bay and Fortune Bay. These were the only bays where fish in the catches exceeded 80 cm. Fish taken from these areas comprised primarily of 5-8 year olds but also some older fish. A comparison of 1993 and 1994 results suggested little change in size of fish. Less than a centimeter difference in average size was observed between years in Notre Dame, Bonavista and Trinity bays.

Catch Rates

General patterns of catch rates were similar for the four weekly periods and showed no trend among bays (Fig. 6). Catches ranged between 1.5 and 2.5 fish per hour. The best catch rates came from Bonavista and Placentia bays, and the poorest were from Conception Bay, especially on the south side of the bay. This confirmed anecdotal reports of low catch rates from that area.

Catch

Table 2 summarizes the estimates of amounts of fish taken over the four week period in each of the bays. Although the estimates for all bays relied on vessel sighting data only from Conception and Trinity bays, the numbers matched reasonably well with the landing statistics. The largest catches came from Bonavista and Trinity bays but were spread widely among bays. The two sets of figures suggest a catch in the range of 1,000-1,500 t assuming that bag limits were adhered to.

Conclusions

Most participants in the fishery considered the food fishery to be a failure. In some areas, experienced fishers failed to take the 10 fish daily limit. However, anecdotal information on catch rates and fish size did not always match with the results of this study. There were no areas with reports of "good" catch rates, in the range of what was experienced in past years (prior to 1992). No data from this period were available to confirm this. Along the Labrador and northeast coast (Northern Peninsula to Conception Bay) the fish were generally small, with the exception of Trinity Bay. Opinion commonly offered by bona fide fishers was that the fishery should not have been reopened in 1994 based on the previous year's fishery or that the fishery had been opened too early. They felt that larger fish would have been taken after late September. On the positive side, it was generally noted that the fish in 1994 were of average condition as opposed to the "slinks" (thin fish) noted in certain areas in 1993.

Table 1a - Summary of sampling from the 1993 Newfoundland food fishery

<u>Location</u>	<u>Measurements</u>	<u>Otoliths</u>	<u>Samples</u>	<u>Avg. Size (cm)</u>
3K				
Notre Dame Bay	739	74	15	44
3L				
Trinity Bay	1,944	36	14	49
Southern Shore	<u>599</u>	<u>50</u>	<u>7</u>	<u>47</u>
Sum	2,543	86	21	48 (avg)
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Total (1993)	3,282	150	36	

Table 1b - Summary of sampling from the 1994 Newfoundland food fishery

<u>Location</u>	<u>Measurements</u>	<u>Otoliths</u>	<u>Samples</u>	<u>Avg. Size (cm)</u>
2J				
St. Lewis	477	0	67	42
3K				
Northern Peninsula N	684	78	95	39
White Bay	437	83	60	42
Green Bay	57	0	11	43
Notre Dame Bay	<u>4,030</u>	<u>281</u>	<u>488</u>	<u>45</u>
Sum	5,208	442	654	43 (avg)
3L				
Bonavista Bay	315	0	52	46
Trinity Bay	5,897	0	622	50
Conception Bay	3,845	213	479	44
Southern Shore	2,143	63	203	51
St. Mary's Bay	<u>798</u>	<u>0</u>	<u>152</u>	<u>54</u>
Sum	12,998	276	1,508	48 (avg)
3Ps				
Placentia Bay	3,835	177	141	53
Fortune Bay	1,104	193	516	52
Hermitage Bay	<u>243</u>	<u>122</u>	<u>20</u>	<u>54</u>
Sum	5,182	492	677	52 (avg)
	-----	-----	-----	
Total (1994)	23,388	1,210	2,906	
Total (1993 and 1994)	26,670	1,360	2,942	

Table 2 - Estimate of catch from the 1994 food fishery. Values are expressed in metric tonnes.

<u>NAFO Div</u>	<u>Bay</u>	<u>Observed Weight</u>	<u>Maximum Weight</u>	<u>Statistic Br. Estimate</u>
2J		9	9	9
3K	White Bay	52	98	
	Notre Dame Bay	96	184	
	Total	148	282	357
3L	Bonavista Bay	141	227	
	Trinity Bay	99	200	
	Conception Bay	81	189	
	Southern Shore	81	123	
	St. Mary's Bay	19	38	
	Total	<u>420</u>	<u>776</u>	<u>850</u>
2J3KL		577	1,067	1,216
3Ps	Placentia Bay	101	164	
	Fortune Bay	60	100	
	Total	161	264	363
	Total	738	1,331	1,579

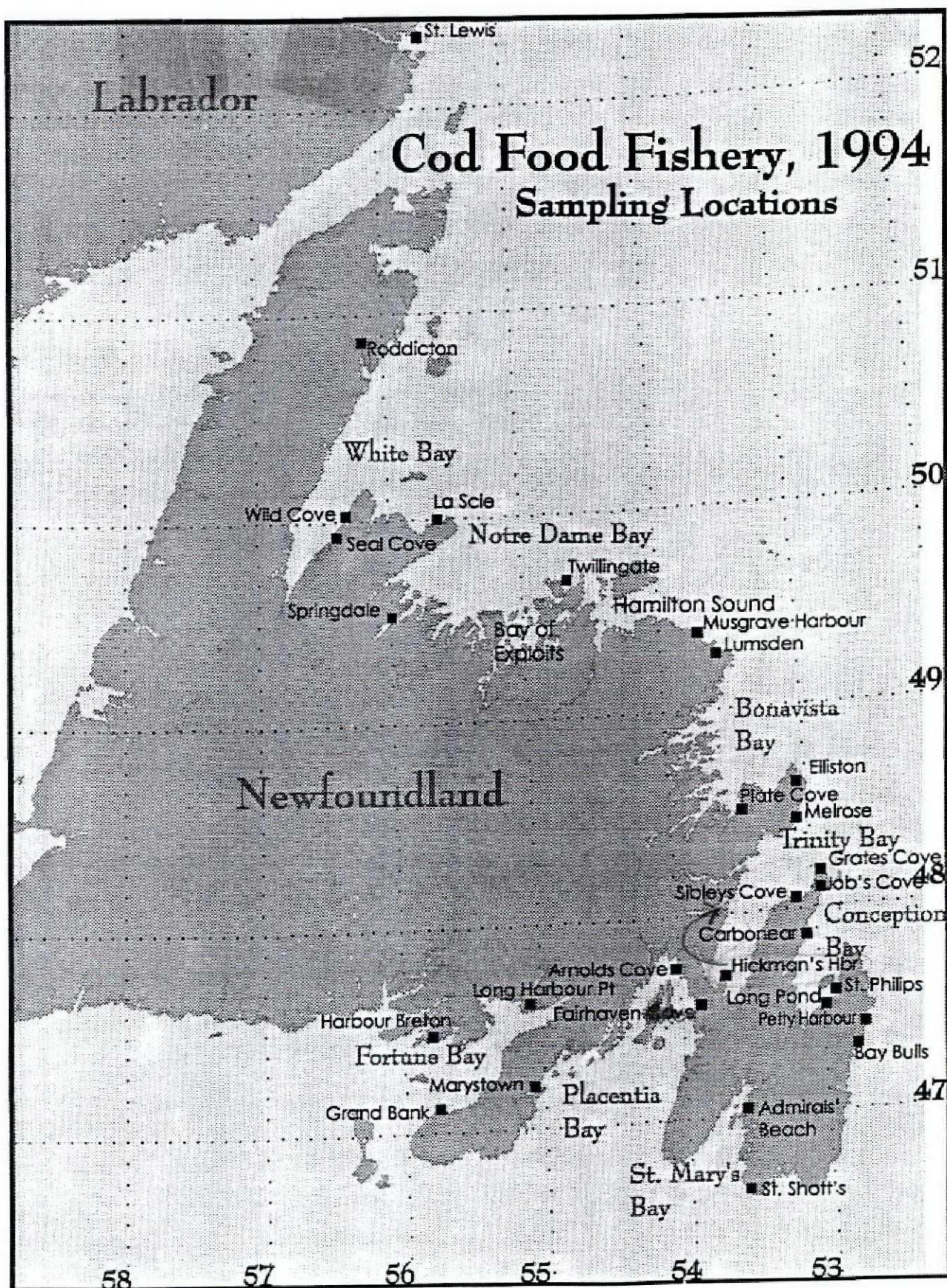


Figure 1 - Map of Newfoundland showing bays from which food fishery samples were obtained, including specific sampling sites.

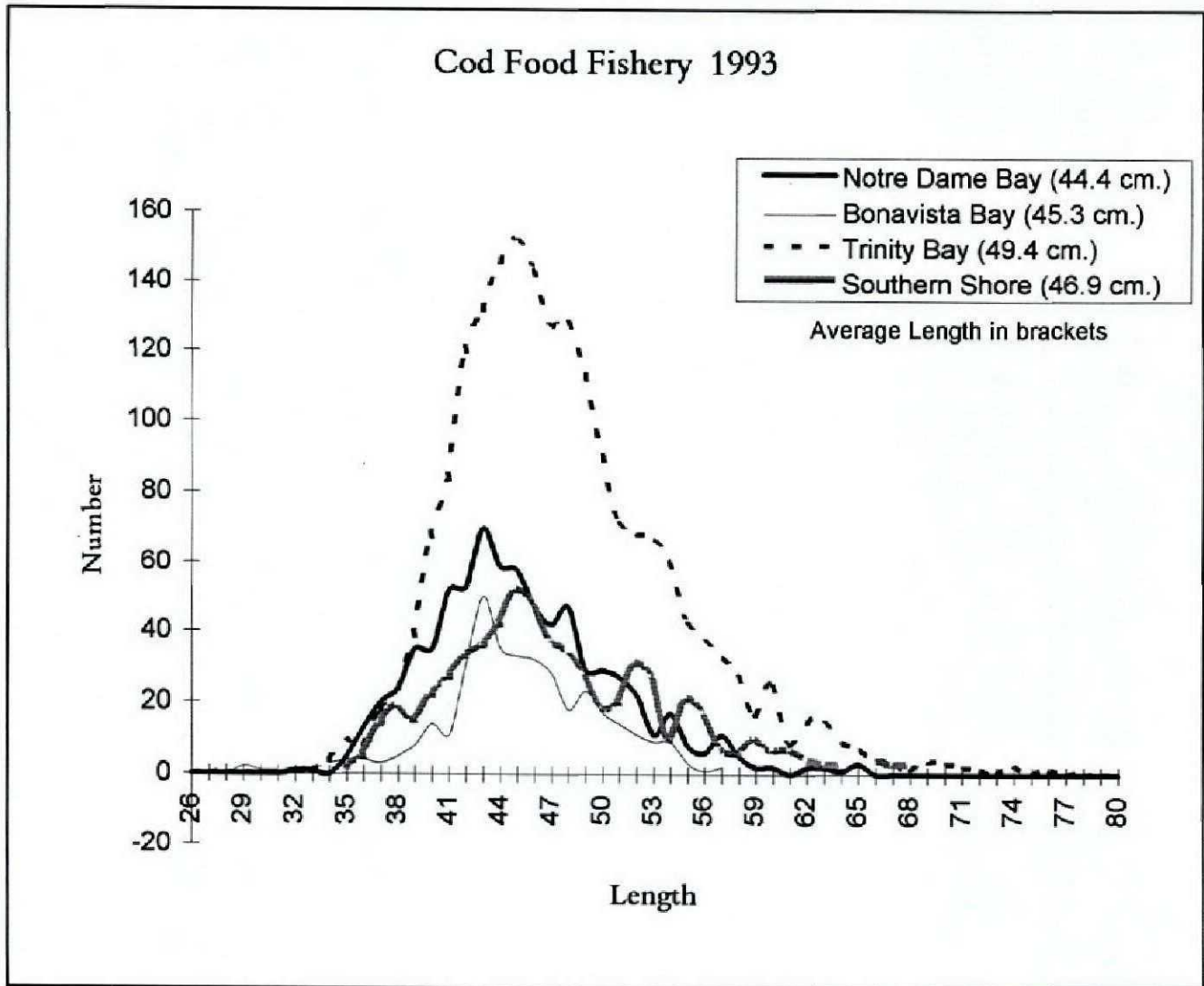


Figure 2 - Summary of fish size by bay for the 1993 food fishery.

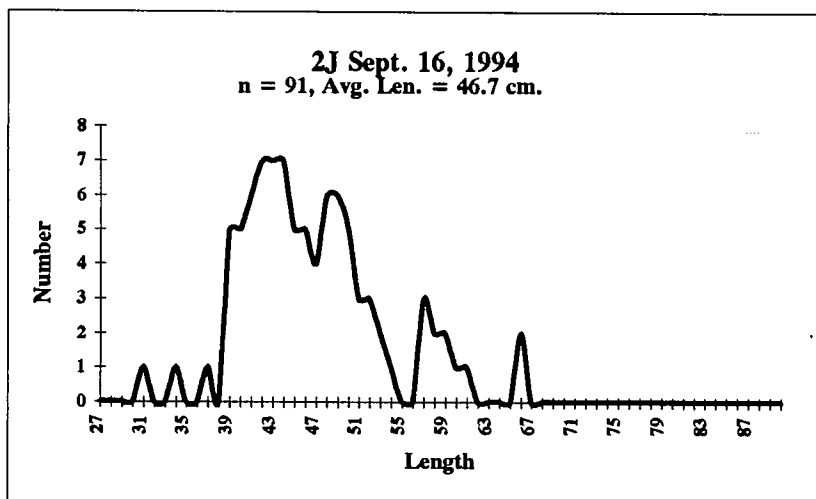
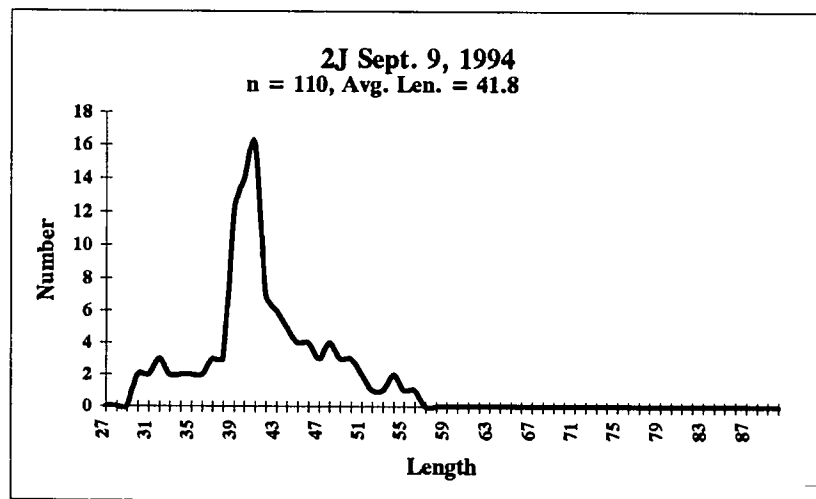
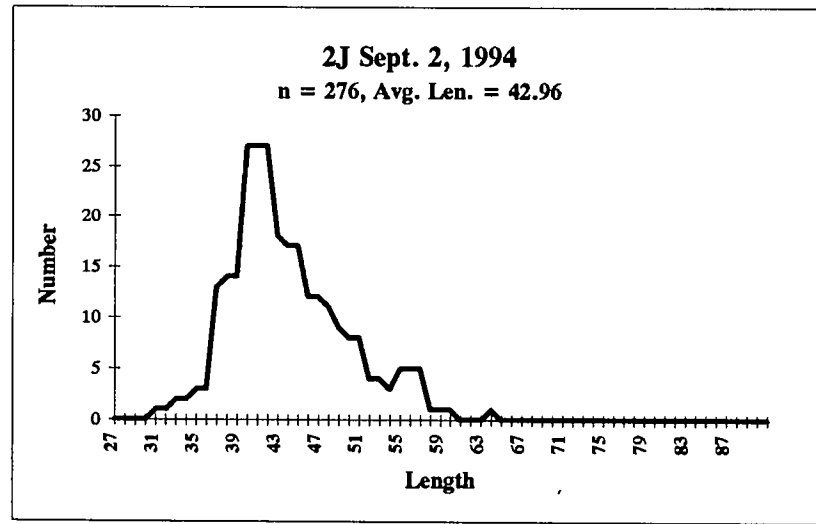


Figure 3a - Frequency of fish measured during three weekly intervals from St. Lewis in 1994.

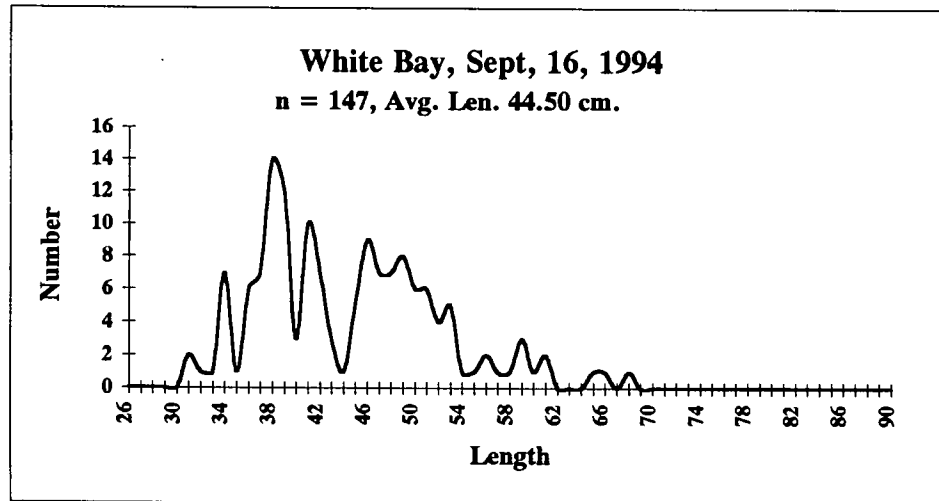
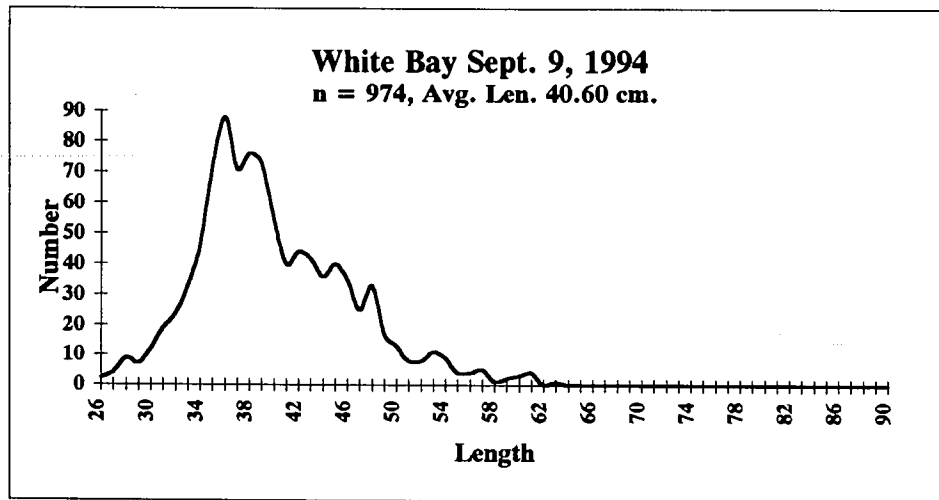


Figure 3b - Frequency of fish measured during two weekly intervals from Roddicton and Wild Cove in White Bay in 1994.

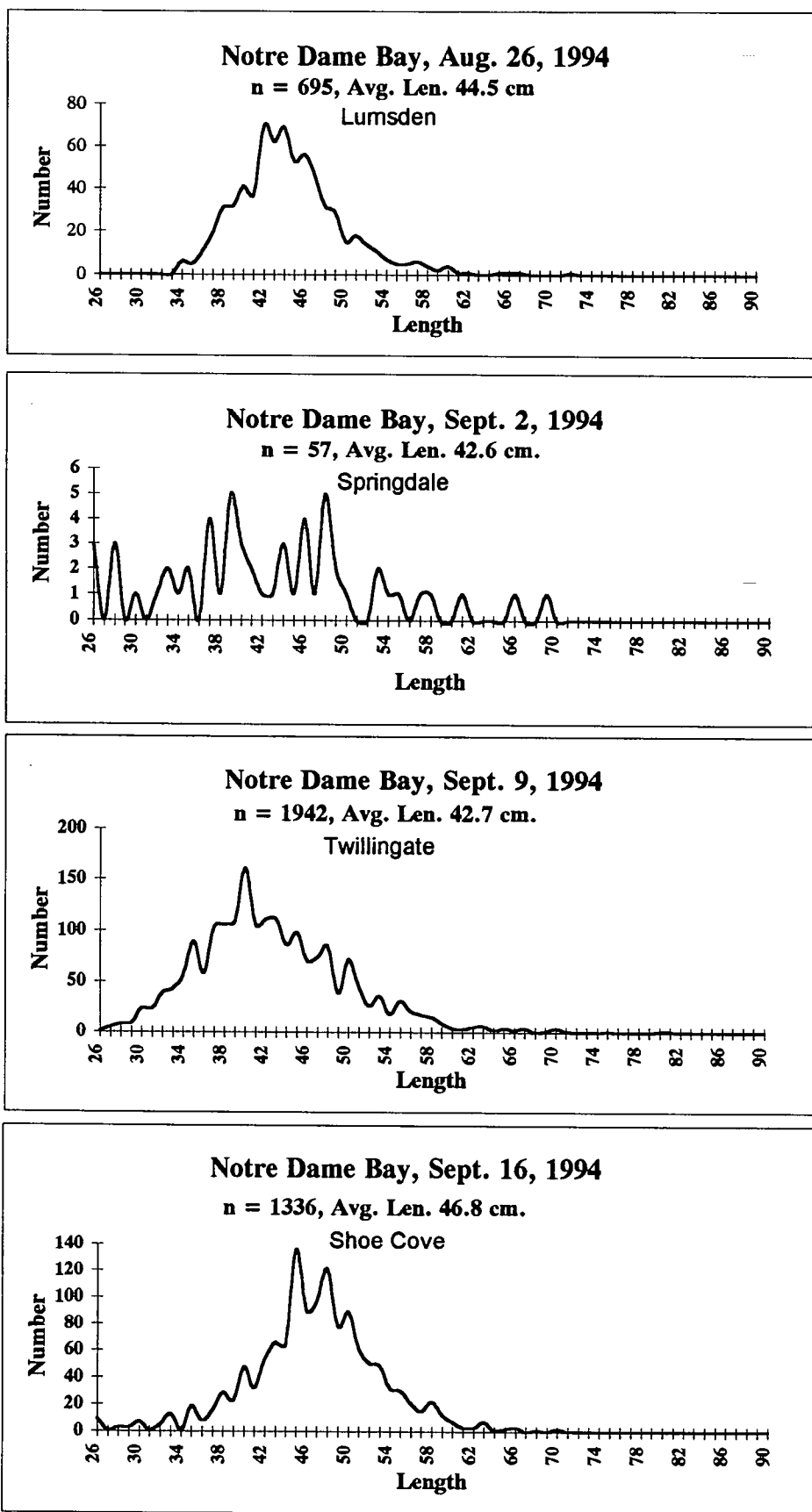


Figure 3c - Frequency of fish measured during four weekly intervals from various locations in Notre Dame Bay in 1994.

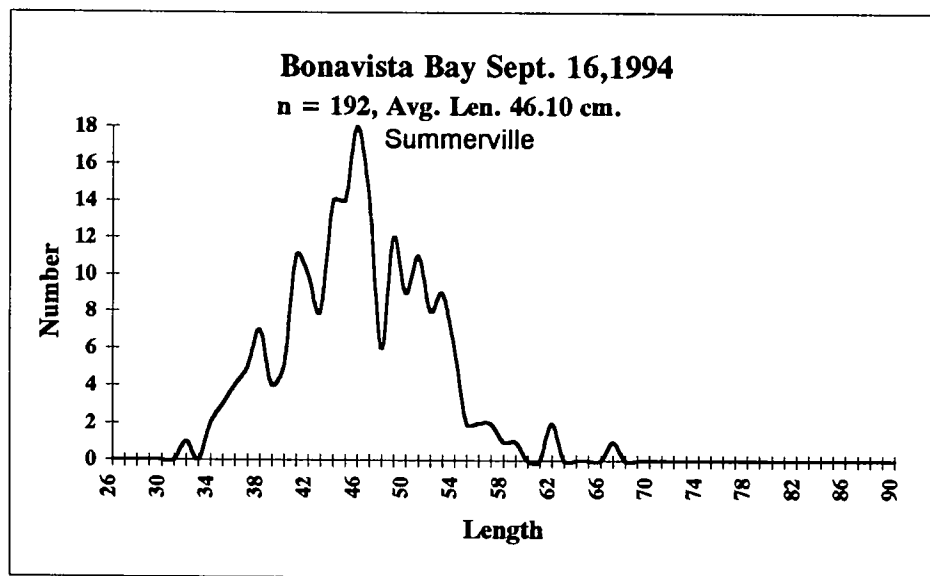
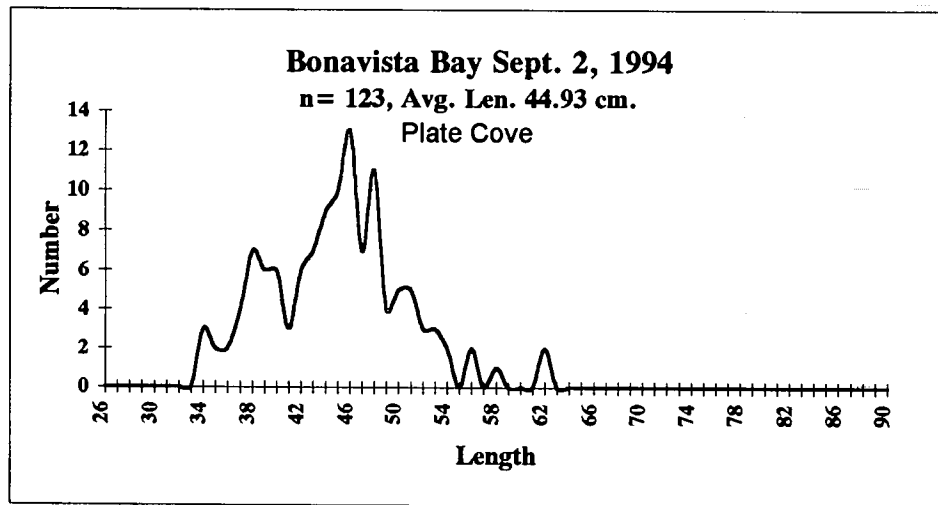


Figure 3d - Frequency of fish measured during two weekly inrevals from Plate Cove and Summerville in Bonavista Bay in 1994.

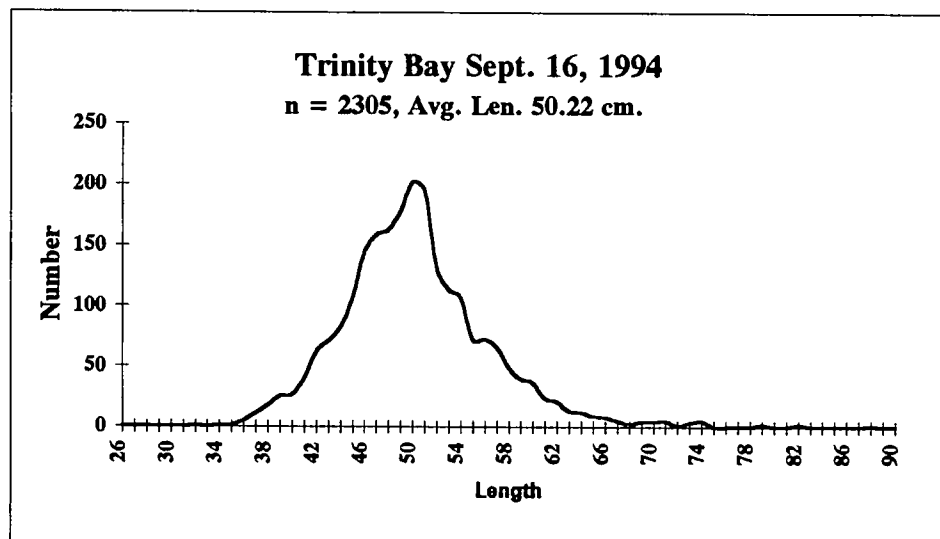
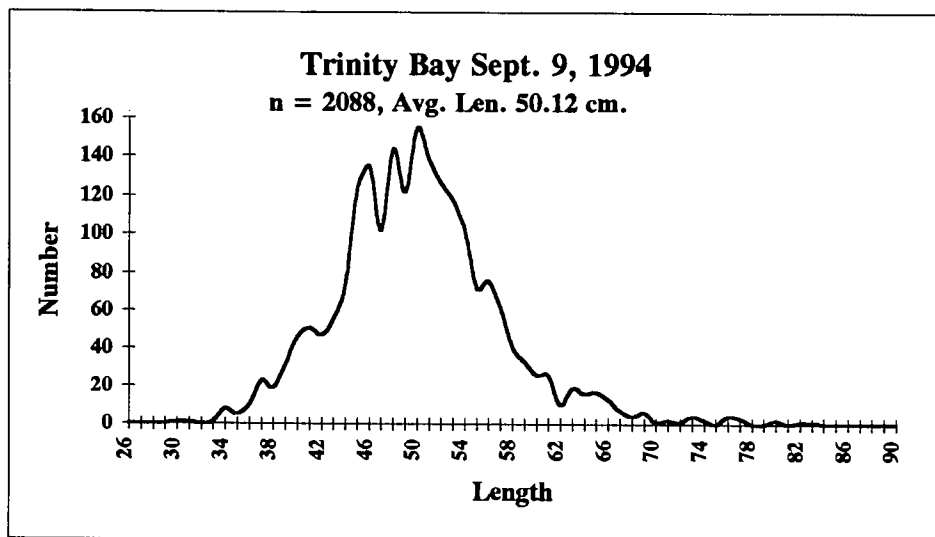
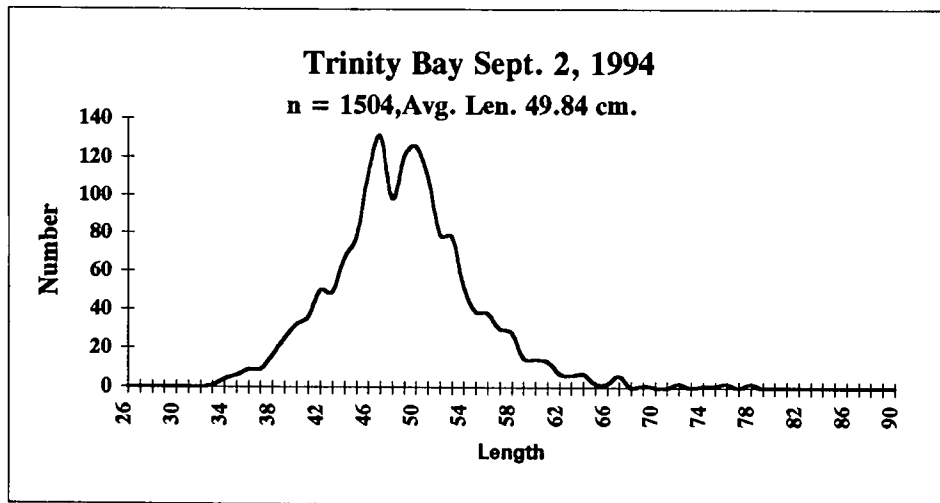


Figure 3e - Frequency of fish measured during three weekly intervals from various areas on Trinity Bay in 1994.

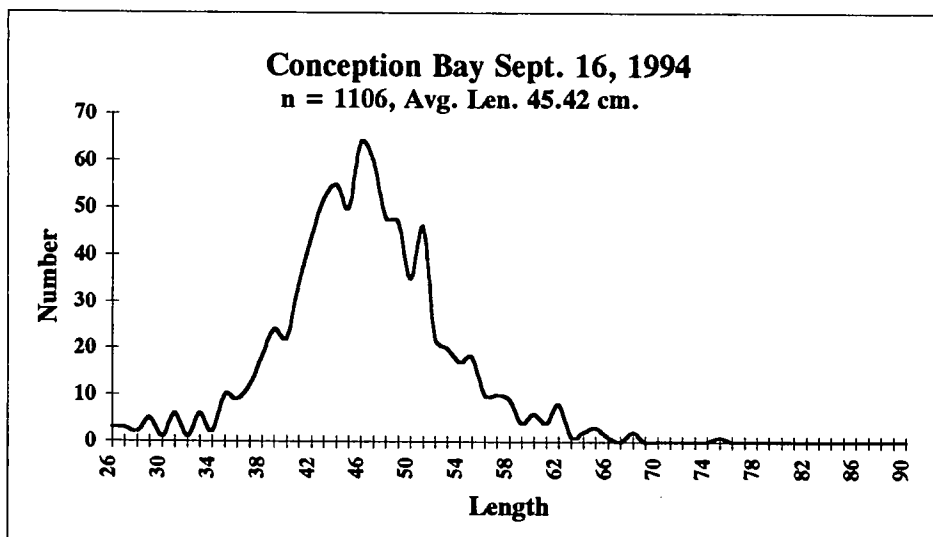
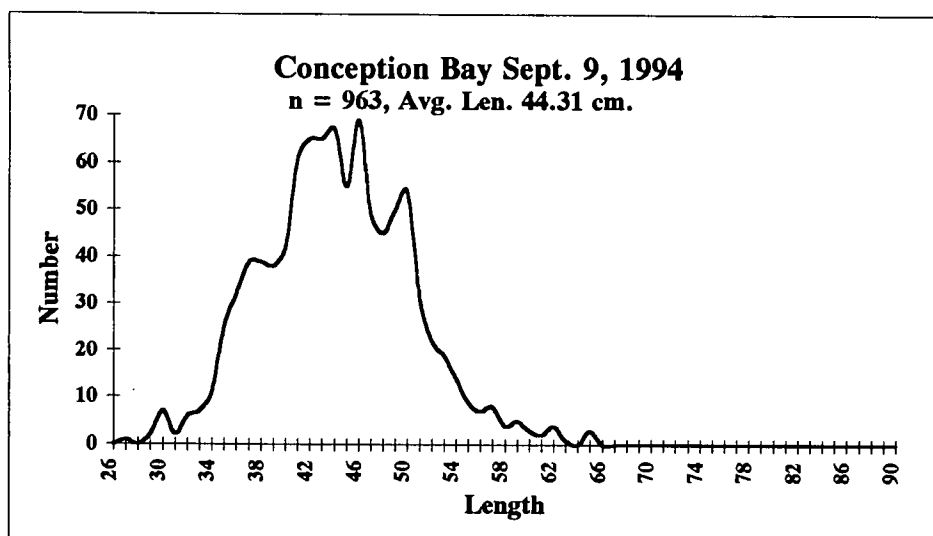
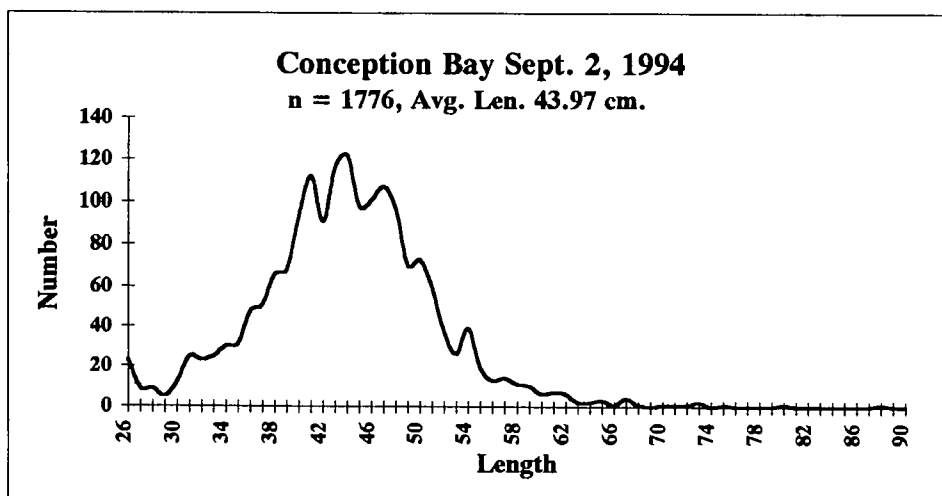


Figure 3f - Frequency of fish measured during three weekly intervals from various areas in Conception Bay in 1994.

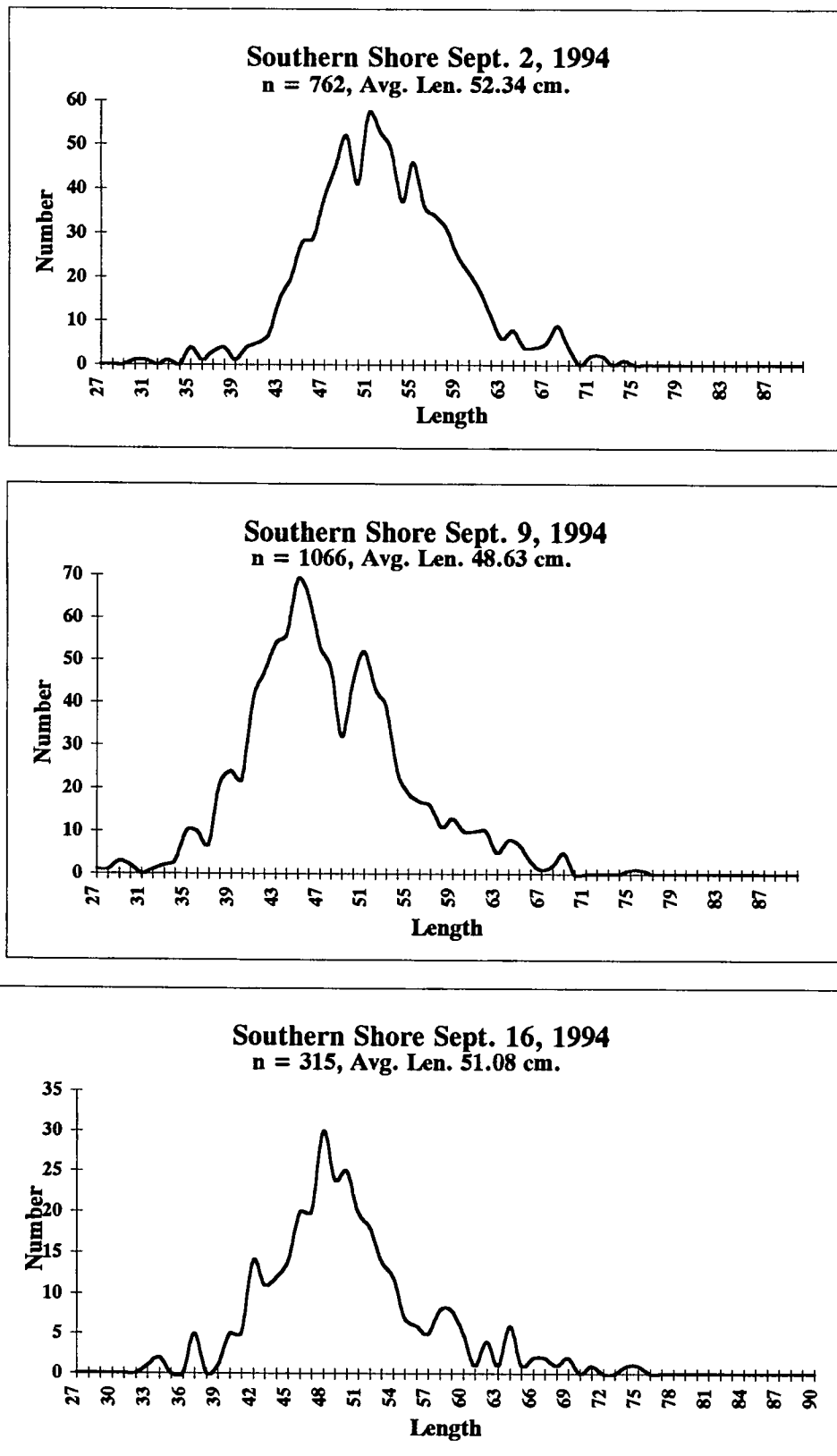


Figure 3g - Frequency of fish measured during three weekly intervals from various areas along the Southern Shore in 1994.

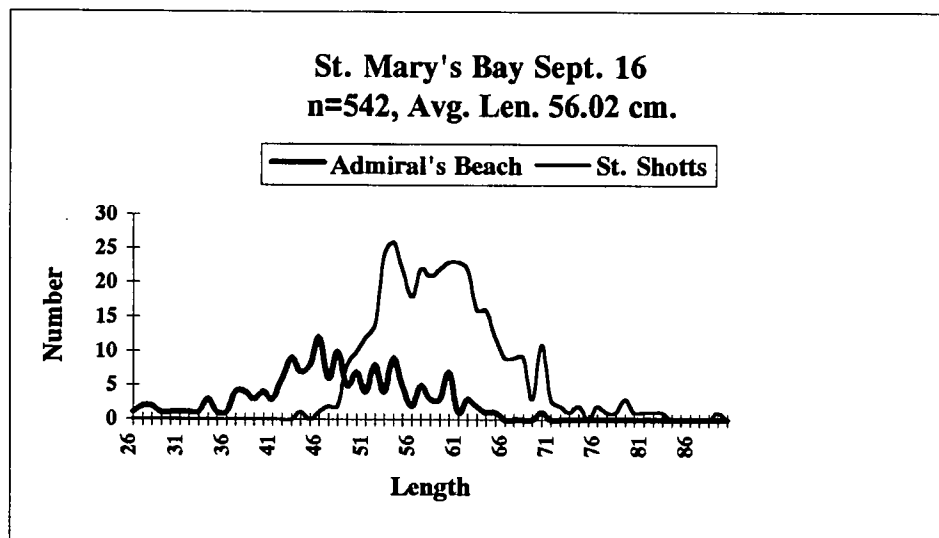
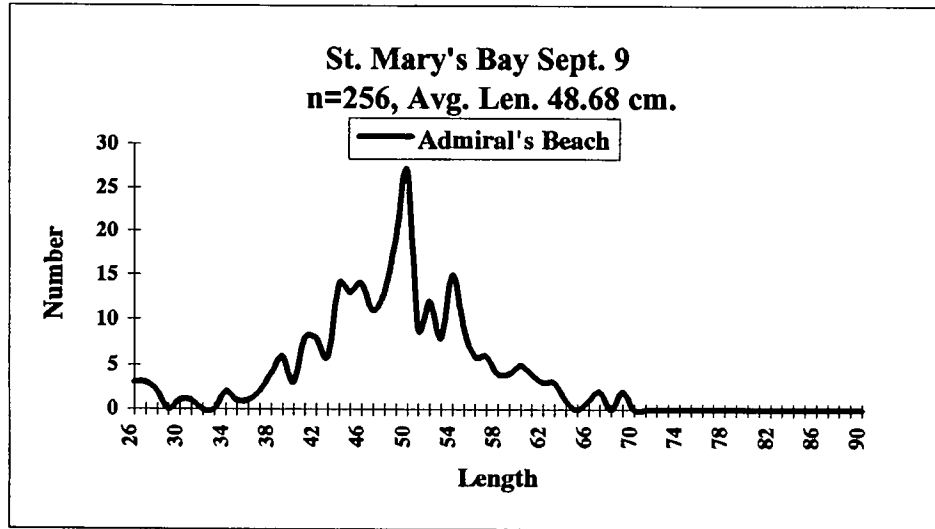


Figure 3h - Frequency of fish measured during two weekly intervals from various areas in St. Mary's Bay in 1994.

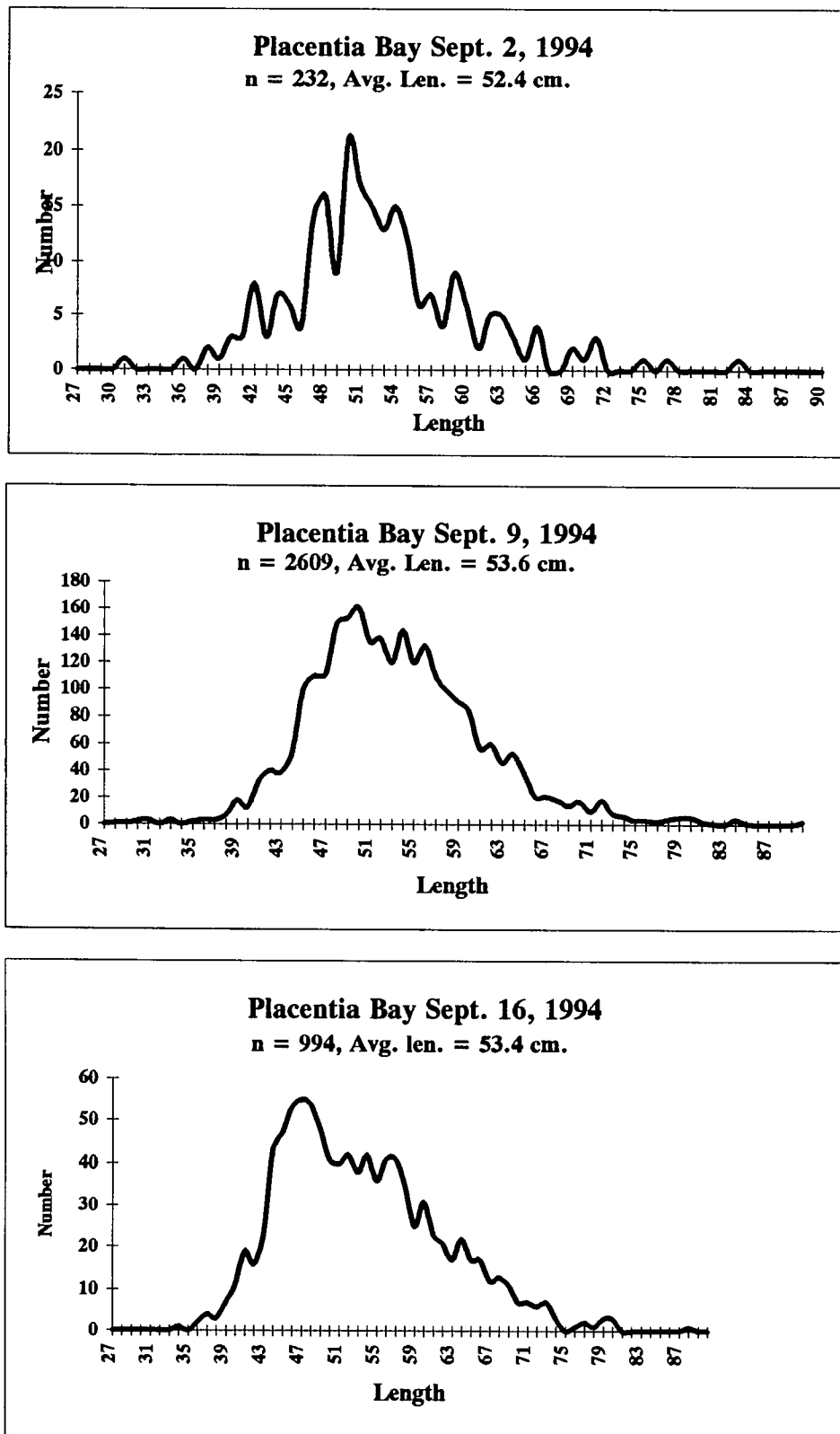


Figure 3i - Frequency of fish measured during three weekly intervals from various areas in Placentia Bay in 1994.

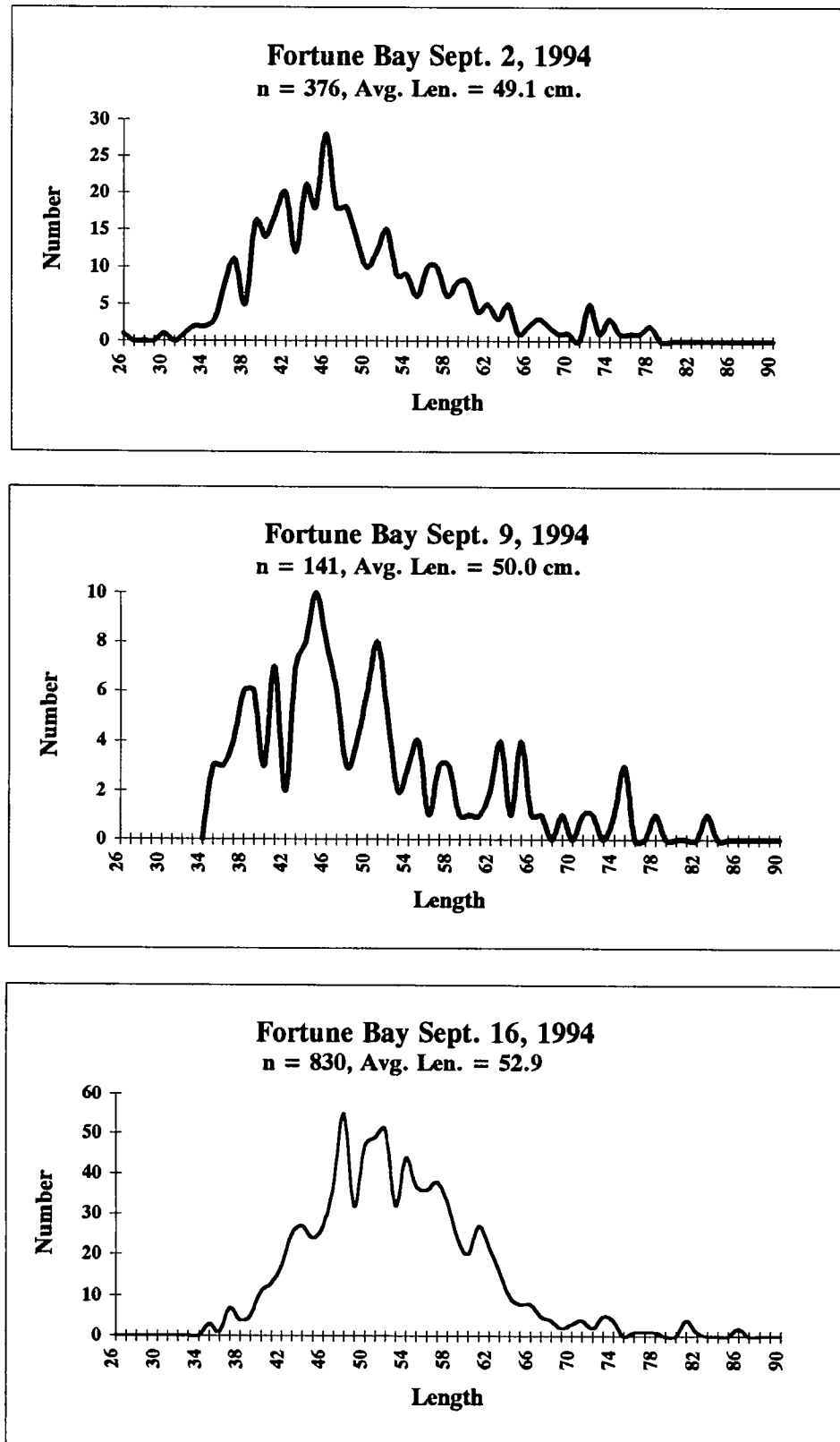


Figure 3j - Frequency of fish measured during three weekly intervals from various areas in Fortune Bay in 1994.

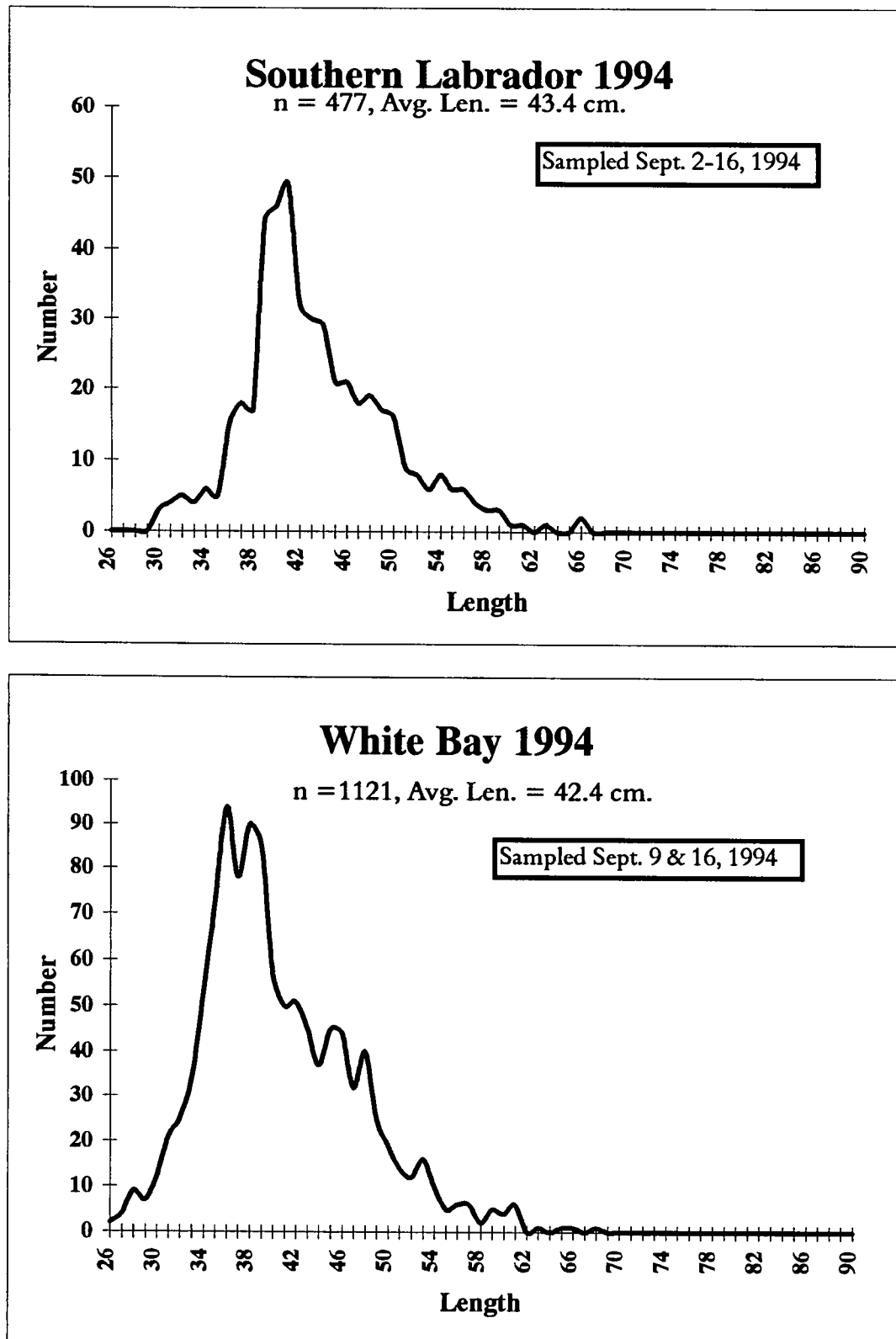


Figure 4a - Combined frequency for all sampled time periods for the 1994 food fishery, Southern Labrador and White Bay.

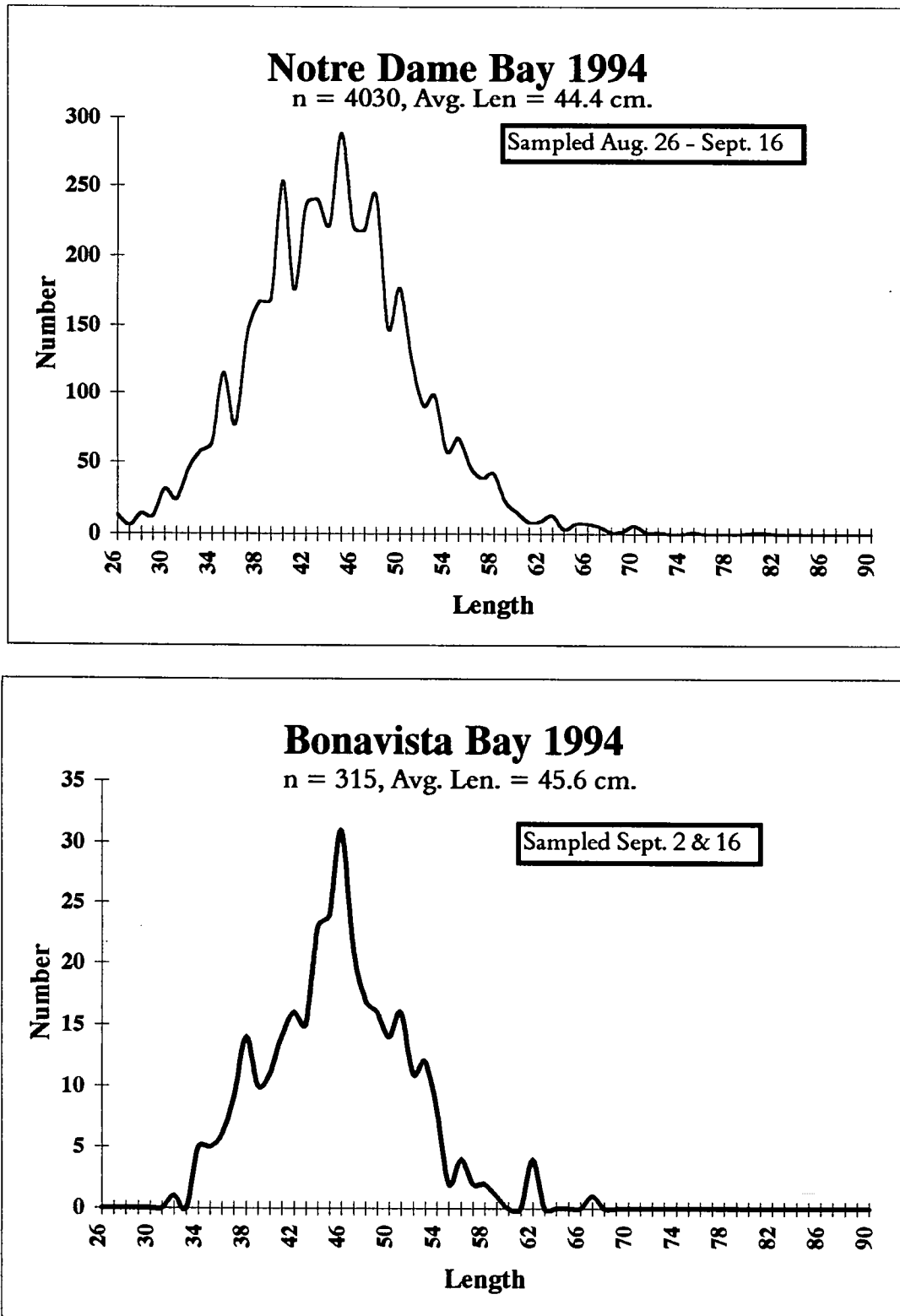


Figure 4b - Combined frequency for all sampled time periods for the 1994 food fishery, Notre Dame and Bonavista Bay.

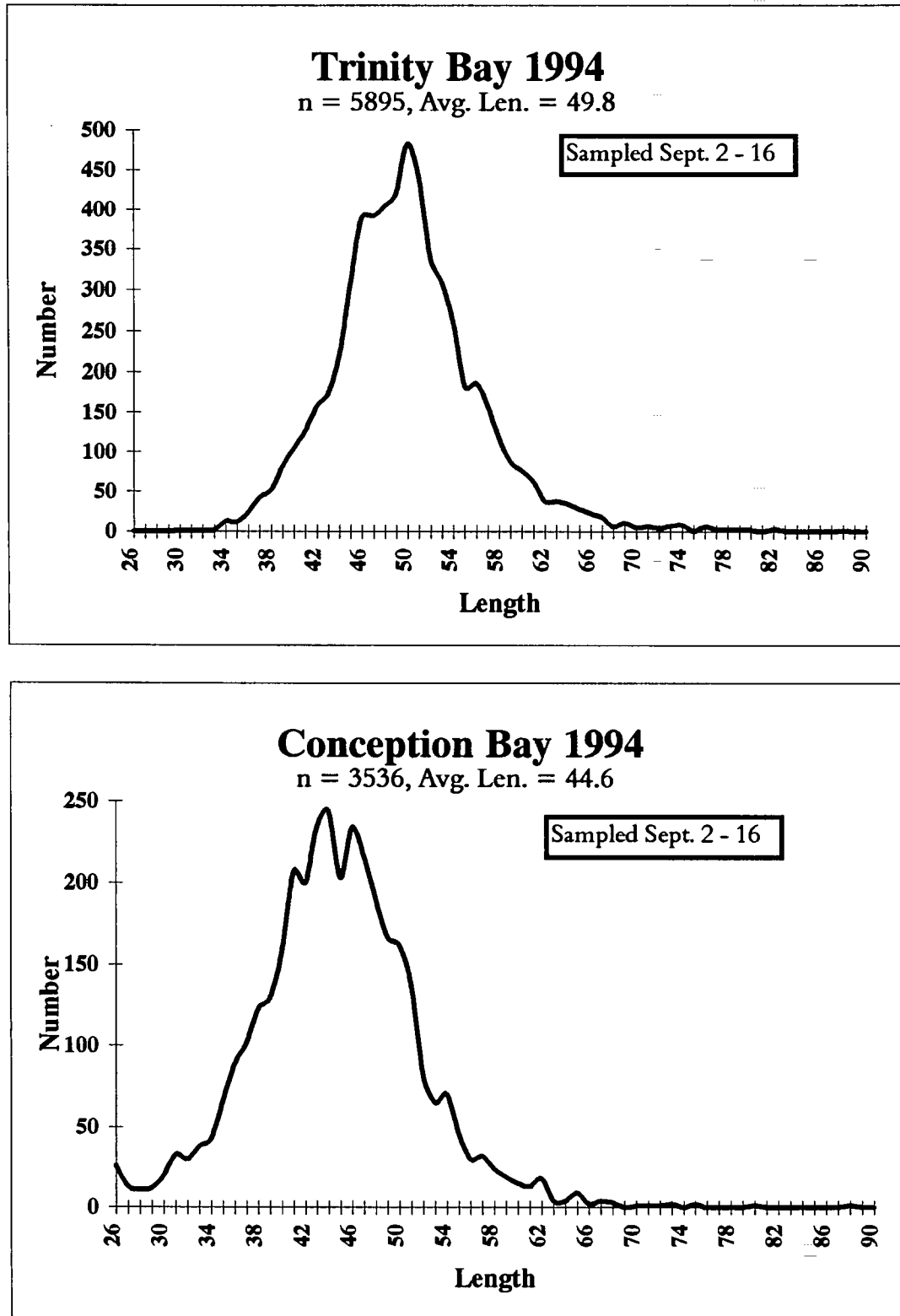


Figure 4c - Combined frequency for all sampled time periods for the 1994 food fishery, Trinity and Conception Bay.

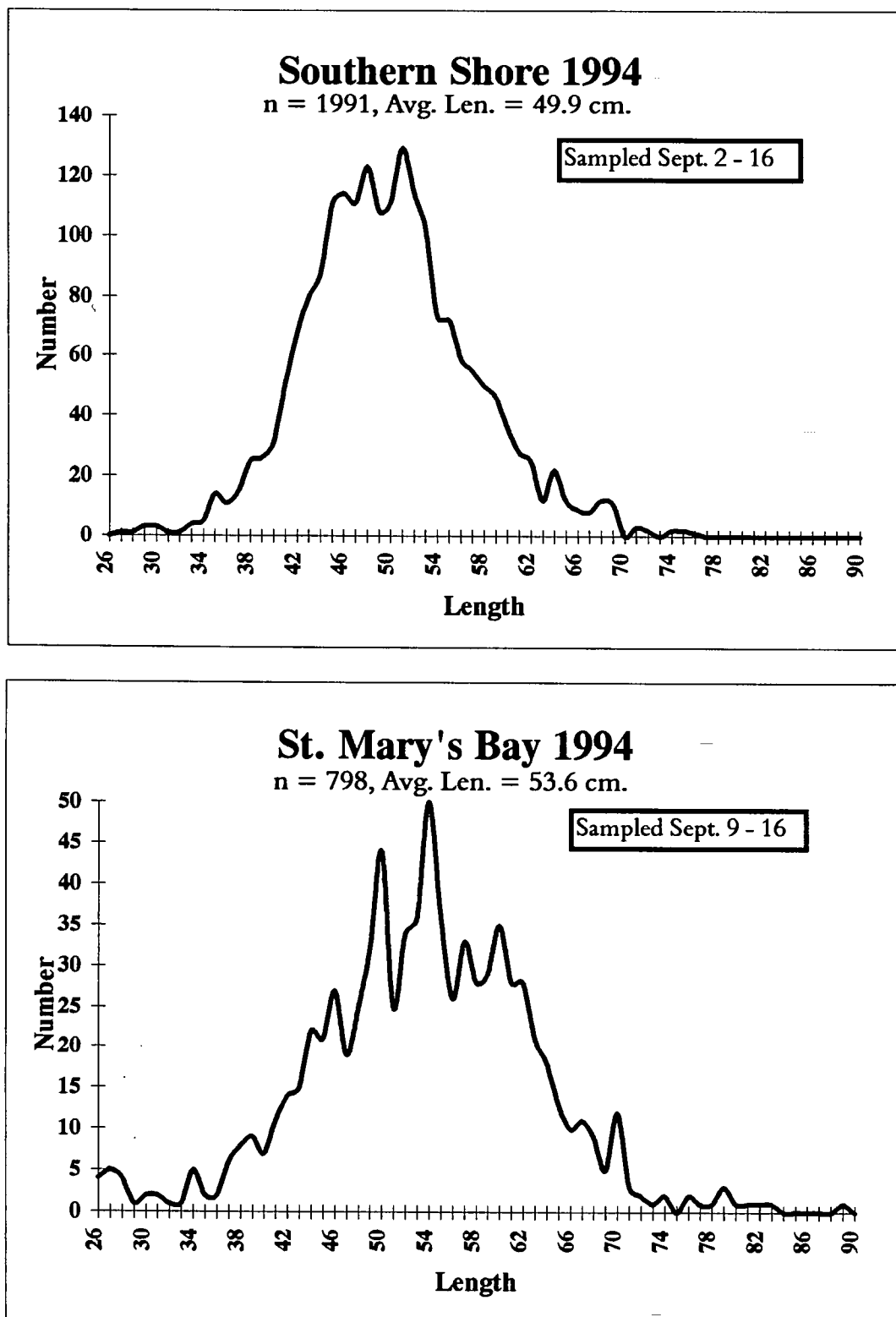


Figure 4d - Combined frequency for all sampled time periods for the 1994 food fishery, Southern Shore and St. Mary's Bay.

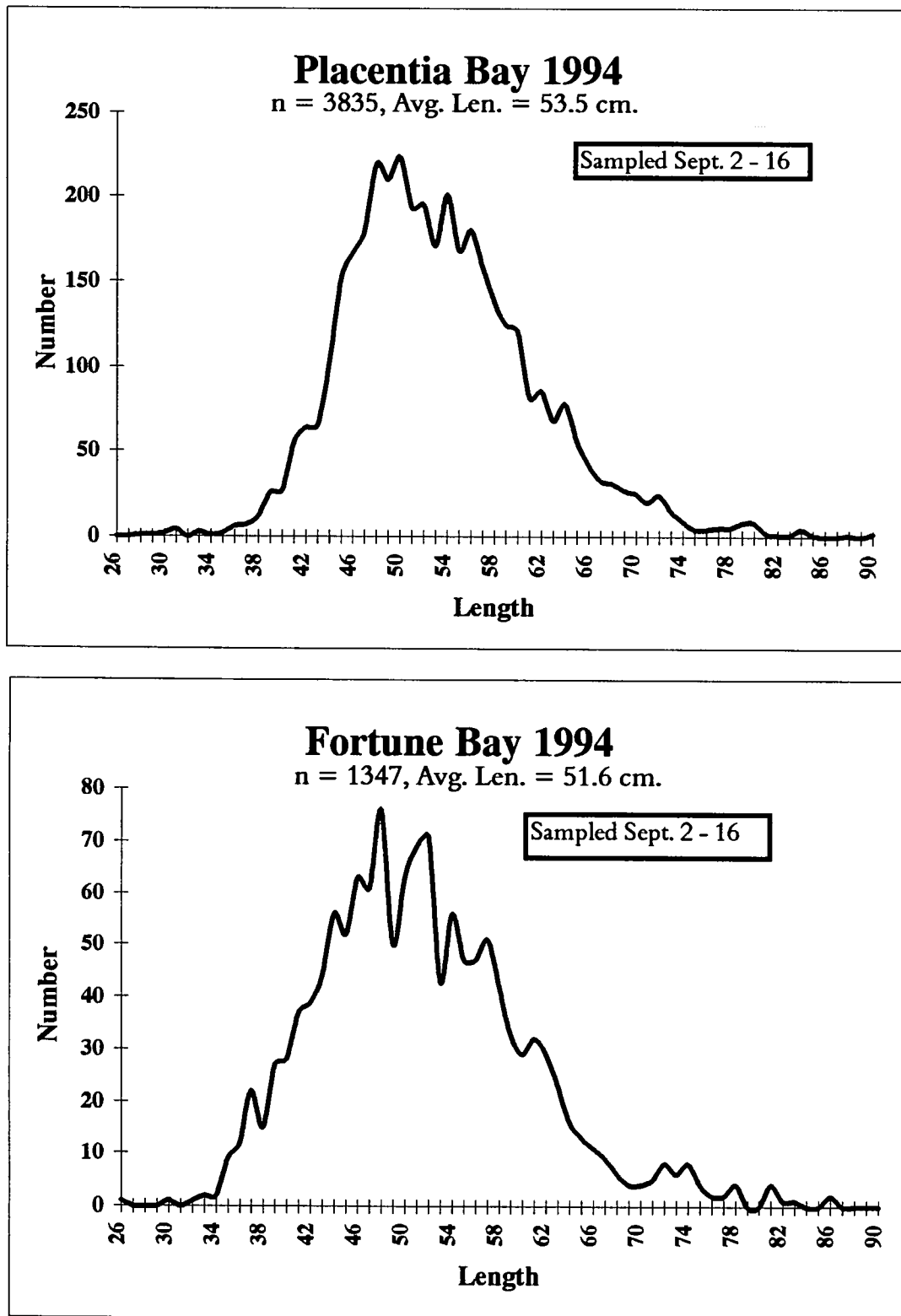


Figure 4e - Combined frequency for all sampled time periods for the 1994 food fishery, Placentia and Fortune (including Heritage) bays.

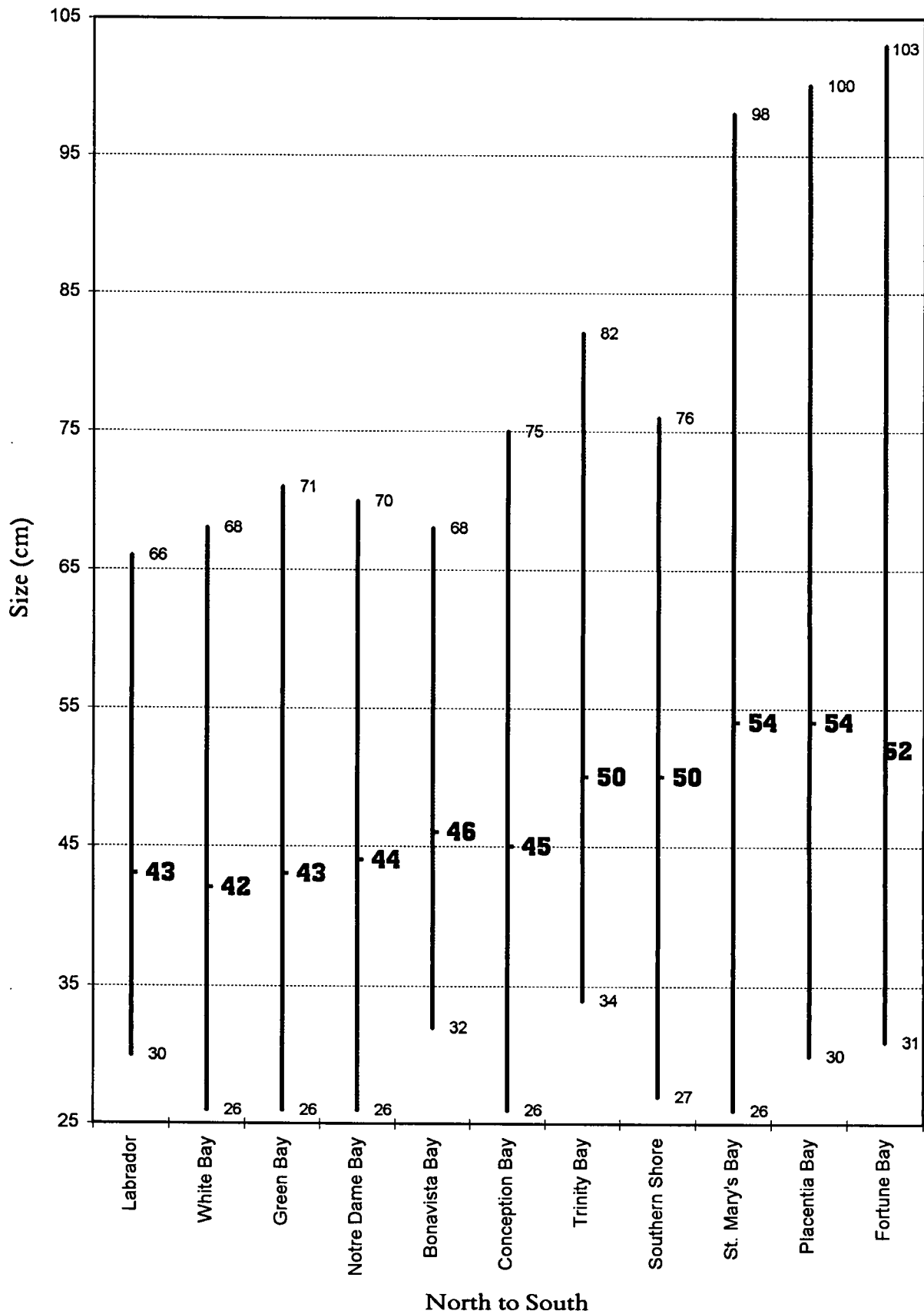


Figure - 5 Average size and range of sizes of cod by bay. Vertical lines illustrate the range of sizes caught in the food fishery while bolded central values are the averages.

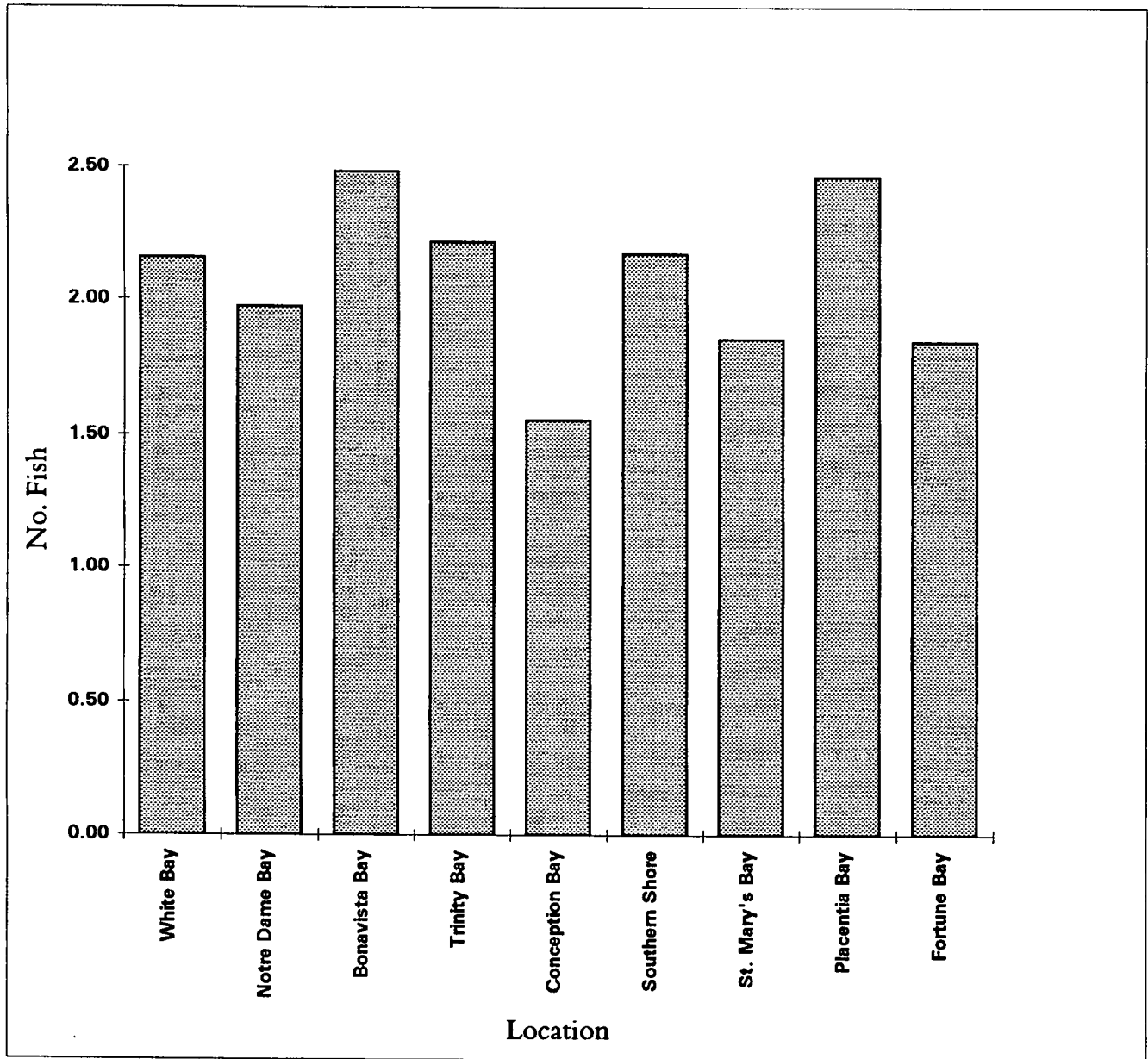


Figure 6 - Average catch (in numbers of fish) per hour per person by bay in 1994.