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Differences in Mean Lengths and Percentages of Females
in Capelin Schools

by

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ABSTRACT

Data collected by observers on commercial purse seiners during the 1982 capelin fishery were analyzed. The average length of males in schools during June remained similar in both Conception and Bonavista Bays. The mean length of females declined while the percentage of females increased during June in Conception Bay. In contrast the mean length of females and percentage of females in Bonavista Bay did not vary throughout June. It was hypothesized that the trends in Conception Bay supported earlier observations. The lack of a similar finding in Bonavista Bay may have been a sampling problem.

INTRODUCTION

The size of capelin (*Mallotus villosus*) and composition of males and females in schools are thought to vary during the spawning season. Close to the beaches, it has been reported that males and females form separate schools (Templeman, 1948; Saetre and Gjosaeter, 1975). The males are found loosely aggregated close to the waterline while females form more compact schools which are further out but still in shallow water. These observations have also been noted by inshore capelin fishermen in the Newfoundland region. Purse seine fishermen have suggested that the percentage of females in schools may range from predominantly all females to hardly any at all. In conjunction with this variation in sex ratio is the hypothesized decrease in lengths of females with time during the spawning season.

As part of a broader program aimed at investigating the migrating behaviour and distribution of capelin schools during the spawning season, this study reports on some observations made by observers aboard six commercial purse seiners relating to female composition and mean length changes in capelin schools in 1982. These results are presented to address questions related to school composition of mature capelin during spawning and may also have bearing on the capelin fishery. Market requirements and product quality are partly concerned with the percentage and size of females landed by the inshore fishery.

MATERIALS AND METHODS

In June of 1982, five observers were assigned to six commercial purse seiners who fished in Div. 3L in June 1982. One vessel also spent three days in Div. 3K. One observer divided his time between two purse seiners. One aspect of their duties was to collect biological samples of capelin from as many purse seine sets as was physically possible. Other duties included validation of logbook entries (Nakashima and Harnum; 1983) and enforcement activities.

From each purse seine set a random sample of capelin was taken. Total lengths to the nearest millimetre and determination of sex were performed on the first 200 capelin in the sample. The sample sheets from all six vessels were collected and analyzed. Mean lengths for all males and for all females from each sample were calculated. The percentage of females in the catch was estimated by counting the number of females in the sample of 200 fish. Most of the purse seiners spent their time in Conception and Bonavista bays (Fig. 1). Samples were also collected in Trinity Bay and Notre Dame Bay, however, there were less than ten and these were concentrated over a few days. The scarcity of samples from these two bays precluded any detailed analysis of the composition of capelin schools in these areas.

RESULTS AND DISCUSSION

From the samples in Conception Bay, there is a definite trend towards smaller females (Fig. 2a) and higher percentages of females (Fig. 3a) in schools from early to late June. In contrast, there is no observable difference in mean lengths of females (Fig. 2b) or the percentage of females (Fig. 3b) in schools sampled in Bonavista Bay. For both bays the mean length of males remains similar throughout the sampling period.

The lack of difference in size of males appears to substantiate an earlier report by Templeman (1948) who observed that males remain in the vicinity of beaches throughout the spawning period. The mean total length of males at Holyrood varied from 189 to 183 mm between June 17 and July 12 and at Grand Beach from 179 to 169 mm between June 20 and July 11 in 1941 (Templeman 1948). Thus one would hypothesize that no obvious change in size of males would be expected which is what is observed in Fig. 2a and 2b.

There is a discrepancy in the data for females between Conception and Bonavista Bays. The observations from Conception Bay are consistent with published studies (Templeman; 1948) and observations by fishermen that females become smaller later in the spawning season and the percentage of females in schools become higher. From Fig. 2b and 3b there are no obvious trends in these characteristics for females in Bonavista Bay. One difference in the samples from these two bays is that all the Conception Bay samples except for four were collected in the region between Harbour Grace and Jobs Cove (section 21, Fig. 1), whereas the Bonavista Bay samples were from all over the bay. A possible explanation resulting from this sampling difference is that for any one locality the changes in capelin school composition with time may be observable and follow specific trends, however, samples from a wide area may be too coarse to be useful in detecting up the differences that were being studied.

Based upon the data available from the 1982 observer program it appears that female capelin follow a trend towards smaller sizes and higher percentages with time while the size of males remains similar throughout the spawning period in Conception Bay. In order to ascertain whether this trend is consistent in other bays, an intensive sampling program will be conducted during the 1983 capelin fishery. Samples of capelin will be collected from capelin traps located in Trinity and Conception Bays and by observers aboard purse seiners. It is expected that the point sampling from capelin traps will provide data as to the validity of the assumption that samples from a small area over time will demonstrate trends in school composition which may not be observable from samples collected over a broad area.

ACKNOWLEDGEMENTS

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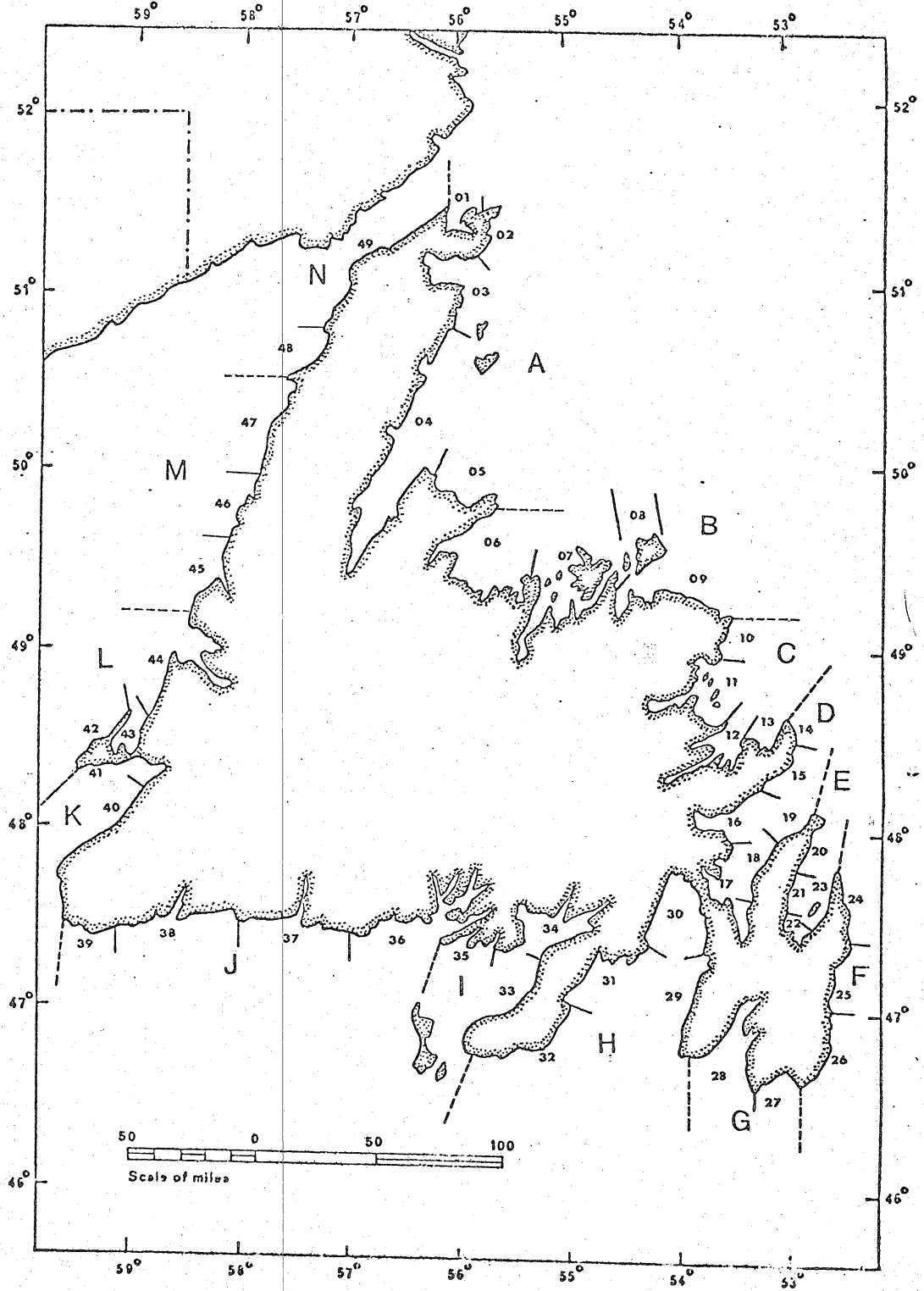


Fig. 1. Location of Conception (E), Trinity (D), and Bonavista (C) bays.

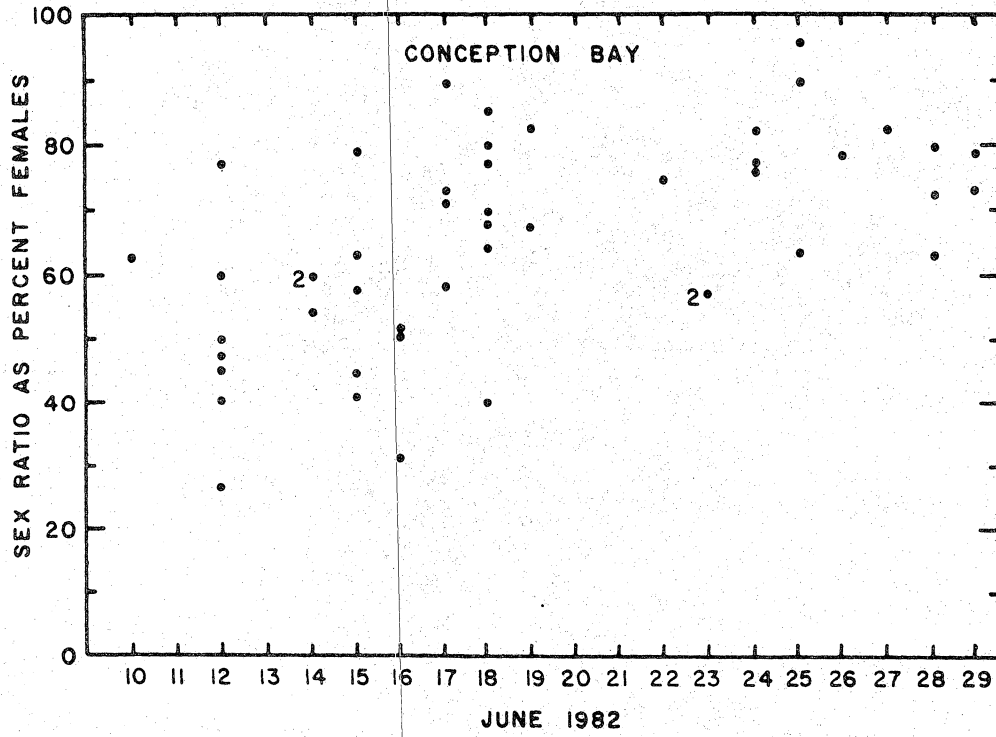


Fig. 3a. Percentage of females in purse seine sets in Conception Bay during June 1982.

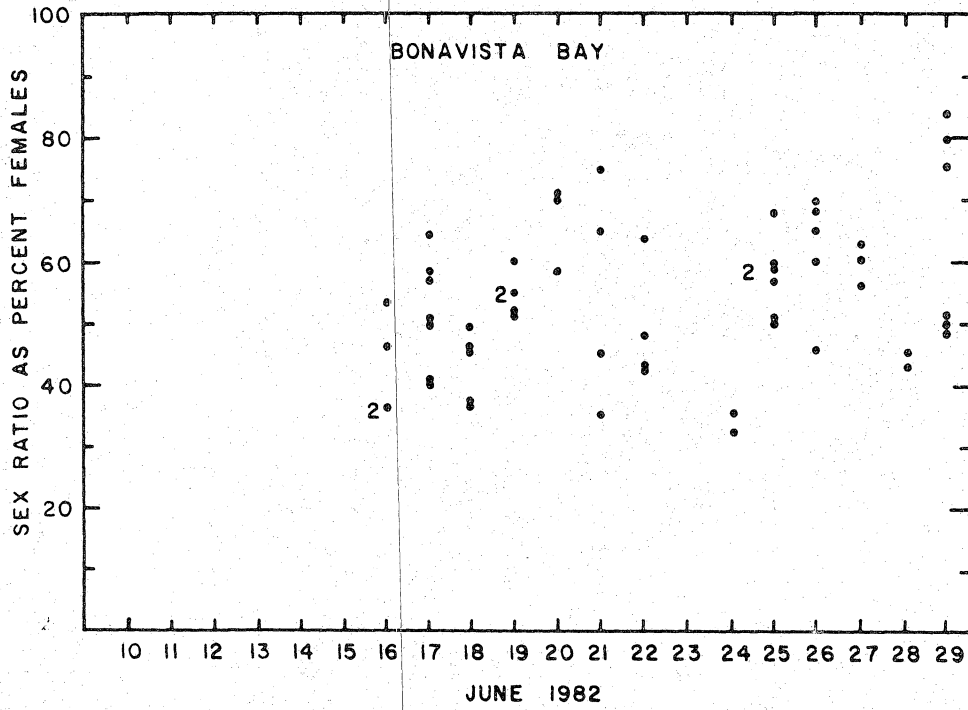


Fig. 3b. Percentage of females in purse seine sets in Bonavista Bay during June 1982.

