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Size and Age Studies of Subarea 4 Haddock

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Average annual haddock landings of about 48 thousand metric tons have been taken from ICNAF Subarea 4 between 1954 and 1958. About 80% of the total came from the southwestern part of the Subarea, about 42% from 4X and 36% from 4W. About 13% came from 4V and 7% from 4T, the eastern divisions of the Subarea. In 4X and 4W most haddock, 50 to 60% of the annual landings, are taken in winter. In 4V and 4T most haddock are taken in spring and early summer.

United States otter trawlers take about 70% of the landings from 4X. As a result, haddock research in this subdivision has become a co-operative program between Canada and the United States, with the U.S. taking responsibility for presentation of current results.

Canadian otter trawlers take most of the haddock landings from 4T, V and W. Canada has taken major responsibility for studying and reporting on haddock stocks and the fisheries in these subdivisions.

Canadian landings of haddock have been sampled regularly for sizes and ages since about 1946. Particular attention has been devoted to landings from 4W and 4V in the period of peak catches, February to July, because of its relative importance. Within these subdivisions, the Sable Island-Emerald Banks regions are most important, accounting for 80 to 90% of the haddock landed from Subdivision 4W.

Canadian research-vessel surveys with small-mesh nets started in the Sable Island-Emerald Banks region in August 1958. Similar surveys were continued in February-March 1959, in July 1959, and extended to Banquereau in Subdivision 4V during this latter period. The results provide information about the relative abundance of year-classes and sizes of fish prior to their recruitment to the fishery.

These commercial and survey data obtained provide information about seasonal and annual changes in sizes and ages of haddock. They show the relative importance of various year-classes, and they are beginning to provide predictions of landings.

Sizes and ages for Subdivisions 4V and W

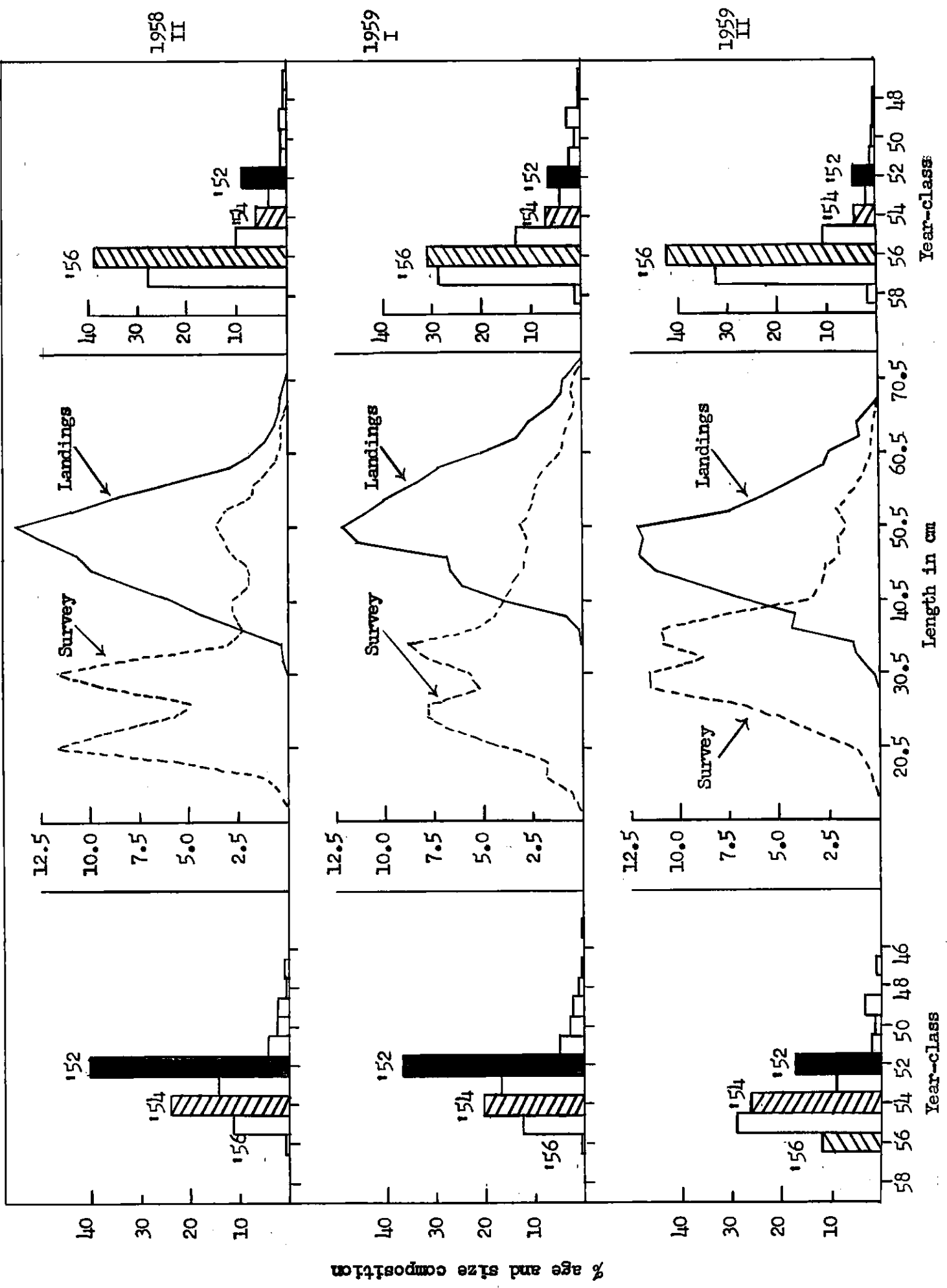
Percentage size and age compositions of haddock landed by trawlers from 4V and 4W for the "summer" of 1958 and "winter" and "summer" of 1959 are compared in the accompanying figure with haddock size and age compositions from research-vessel surveys at about the same time. Landing samples are mainly from 4W although a few mixed trips to 4V and 4W are included. All landings in "winter" are gutted fish and "summer" samples include only a few from trips landing round haddock. All landings were by vessels using 4-inch mesh or greater, but with various types of topside chafers.

Survey results are mainly from Subdivision 4W as caught in "summer" by a #36 trawl (60-foot headrope) with codend cover of 1½-inch mesh and in "winter" by a #41 trawl (79-foot headrope) with 1 1/8-inch mesh liner.

COMMERCIAL LANDINGS

SURVEY AND LANDINGS

SURVEY CATCHES



Comparison of percentage size and age compositions of commercial landings and survey catches from Subdivisions I and II, 1958 I and II, 1959 I and II.

Comparisons

The majority of haddock landed in both winter and summer periods were between 40 and 60 cm. Highest percentage landings were about 50 cm for all three periods, although in the "winter" there was a tendency to land a greater percentage of large haddock. Haddock usually entered the fishery during their fourth summer and fish over 7 years of age made up a relatively small proportion of the landings. Throughout this period, the 1952 year-class has been abundant. This year-class became important to the fishery in the summer of 1956 and has continued to be predominant in the landings up to the winter of 1959. By the summer of 1959 the 1954 and 1955 year-classes made up the highest proportion of the landings, with the 1956 year-class beginning to enter the fishery.

In contrast to commercial landings the size composition of survey catches showed a high proportion of small fish. In the summer of 1958 there were peaks in the percentage age composition at about 20 and at about 30 cm. By the summer of 1959 these peaks had increased to about 28 and 36 cm, respectively. A peak at about 20 cm did not recur in 1959. Among large fish in the surveys the greatest percentage occurrence was at about 50 cm, close to the peak found in commercial landings.

Small fish peaks noted above resulted from the high proportion of the 1957 and 1956 year-classes in the survey catches. The 1958 year-class appears as an extremely small percentage of the 1959 summer survey catch. This contrasts with the large numbers of the 1957 year-class in the 1958 survey catch, and suggests poor survival of the 1958 year-class.

Among large fish in the survey catches, the 1952 year-class predominated.

Discussion

These data from landings and survey catches provide information about the trends in the fishery. The 1952 year-class has been the major factor in the relatively high landings of haddock from Subdivisions 4V and 4W during recent years. None of the year-classes entering the fishery since 1956 have been as large. Based on past records, we would expect the 1956 year-class to be important as scrod in the 1960 fishery. Similarly, the 1957 year-class should begin to contribute to the fishery in 1961. With the 1952 year-class passing out of the fishery, the influx of new year-classes should tend to lower the average size of haddock landed.

Because the commercial vessels tend to fish concentrations of larger haddock and use large-mesh nets, the percentage age and size compositions of their landings are markedly different from those of the survey, which is carried out in a variety of areas with small-mesh nets. Direct comparison between the curves in the figure tends to be misleading. However, our information on changes in distribution of haddock has been insufficient to allow more precise numerical equating between the two sets of data.

We lack comparative data to assess the actual size of the pre-recruit year-classes. The survey data suggest that compared to the 1954 and 1955 year-classes, the 1956 and 1957 year-classes are relatively large. The results also indicate that the 1958 year-class is much smaller than average. However, mortalities and distribution of young haddock must be studied further for more precise predictions.

Tentative conclusions are that during 1960-62, relatively good haddock fishing will be found as year-classes 1956 and 1957 pass through the fishery. The apparent poor year-class of 1958 may affect the fishery adversely toward the end of this period.