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Sizes, Catches, and Landings of Haddock by Canadian Otter
Trawlers from Subdivisions 4V and 4W

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Recent Canadian groundfish research in ICNAF Subdivisions 4V and 4W has concentrated on haddock and cod. Besides collecting effort and area statistics for commercial landings, these landings have been sampled for size and ages of fish. Discard estimates have been obtained by sampling catches at sea and the landed portion of these catches. In addition, research vessel surveys were begun during the summer of 1958 and continued in the winter of 1959.

Haddock was the most abundant species taken both in the surveys and during the sea sampling trips on commercial trawlers. The following account presents some of the results obtained:

Methods

During late August 1958 the M. V. Harengus made 48 tows of 45-minute duration in surveying the region of Sable Island Bank and Emerald Bank (Figure 1). A #36 manila trawl (60-foot headrope) and a cover of 1½-inch mesh cotton over a nylon codend was used throughout. Lengths of fish caught were recorded and otoliths were taken for age determination from a representative sample of all sizes.

Surveys were continued in this region during February and March 1959, and extended to Banquereau with the C.G.S. A. T. Cameron. Tows were of 30-minute duration, using a #41 net (79-foot headrope) and a manila codend of 1½-inch mesh without cover. Fish measuring and sampling procedures were similar to those used in August.

From May to November seven trips were made on commercial trawlers to measure sizes of fish caught at sea and sizes landed from these trips and thus obtain estimates of quantities and sizes discarded. Six of these trips were made in the Banquereau-Sable Island Bank region (Figure 1). All were on otter trawlers between 150-500 gross tons which fished with 1½ Iceland manila trawls (headrope about 80 feet) with large-mesh codends (4½ inches or more) but with various attachments of top chafing gear. Most tows were of 1½-hours duration and catch per trip of all species ranged from 100 to 200 thousand pounds. At sea length samples from as many tows as possible were taken and measured. Detailed estimates of catch by species were recorded for each tow. Length samples of the landings were taken from these trips. The combined catch samples have been compared with the combined landing samples to obtain an estimate of discards.

Routine sampling for sizes and ages of fish landed is carried out in several major fishing ports. For this comparison, samples taken from landings by large otter trawlers at Louisbourg, Lunenburg, and Halifax, N. S., during the Quarters August to October 1958 and February to April 1959 (Quarter III and Quarter I, respectively) have been used. All these fish were taken from the Banquereau-Sable Island Bank area.

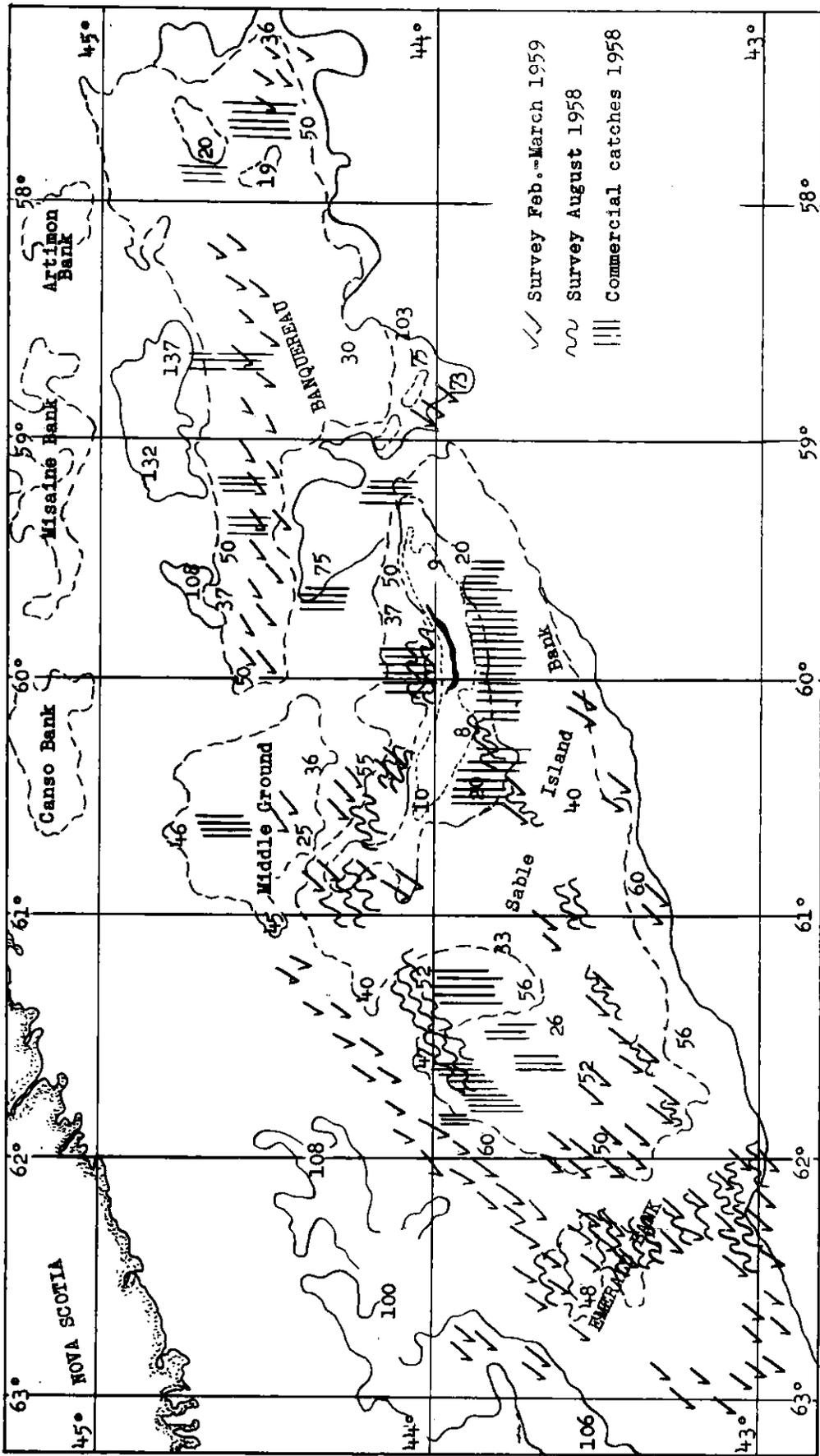


Figure 1. Approximate locations of haddock catches in surveys August 1958 and February-March 1959, and in commercial catches sampled for discards during 1958.

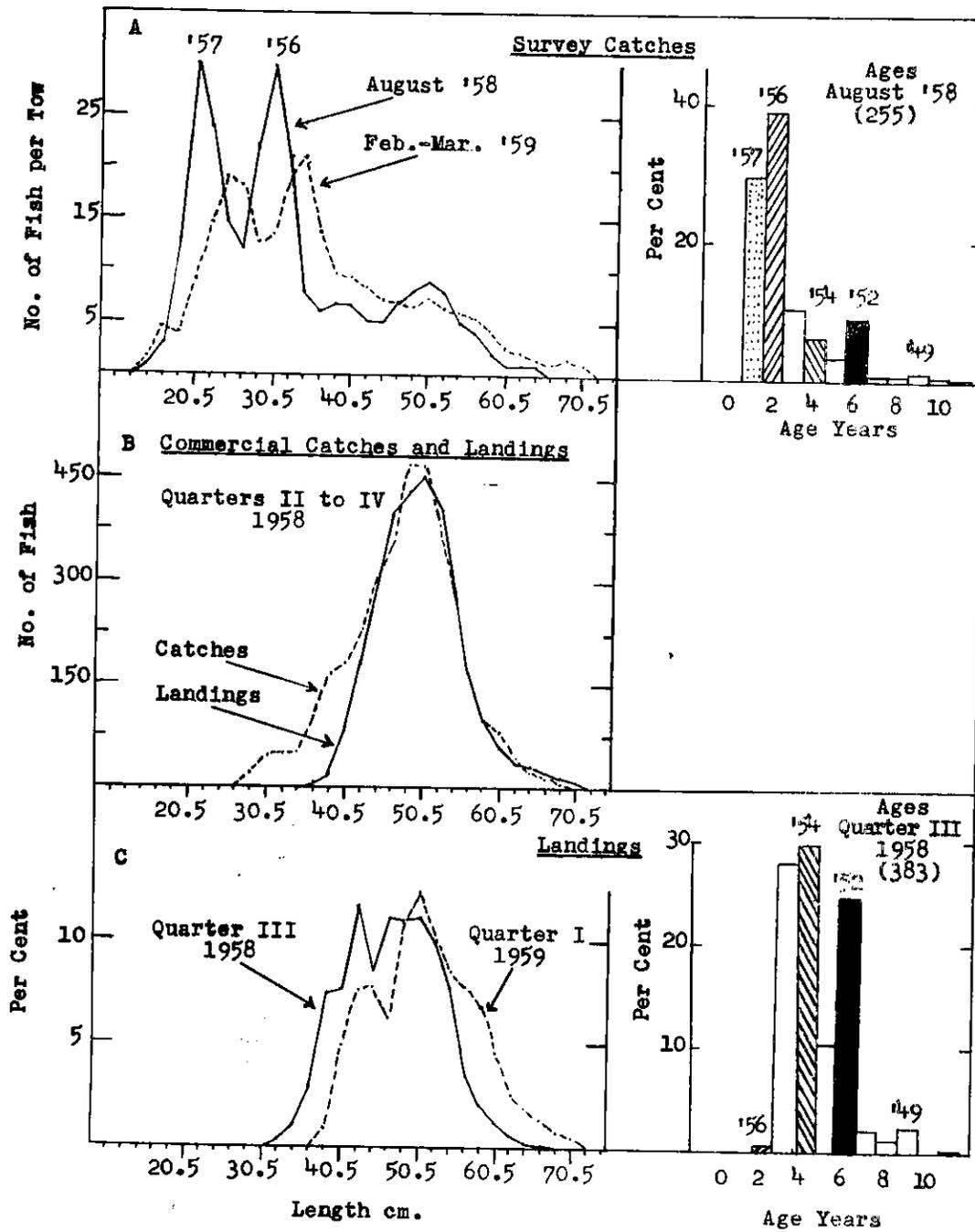


Figure 2. A. Haddock catches in survey of Subdivisions 4V and 4W during August 1958 and February-March 1959.
 B. Samples of commercial catches and landings from Subdivisions 4V and 4W, Quarters II, III, and IV, 1958.
 C. Landings of haddock from Subdivisions 4V and 4W, Quarter III, 1958, and Quarter I, 1959.

Discussion

Surveys: Small fish of the year-classes 1956 and 1957, modal sizes around 30 and 20 cm. respectively, were most numerous in the survey catches during August (Figure 2A). Among the large fish the 1952 year-class, six years old in 1958, was most important. Haddock of the 1952 year-class were present in greater numbers than either the 1953 and 1954 year-classes, and were almost equivalent numerically to fish of the 1955 year-class.

Small fish predominated in the February-March survey catches although larger fish made up a greater proportion of the catch than in summer. It is believed that the length modes at about 24 and 34 cm. represent the 1957 and 1956 year-classes (ages have not yet been determined). It appears that the modal sizes of these two year-classes have increased by about 4 cm. between August and March.

Discards: Numbers of discards depend upon the size composition of fish available to the fishery, selection by the gear, and culling by the fishermen. All these are variable and depend upon area, season, mesh size, and market conditions.

Previous sampling and estimates of haddock discards in 1951-52 showed that small-mesh nets used by the commercial fleet (about 2 7/8 inches) were catching haddock of about 30 cm. in length in large numbers. Discards at that time, for the spring and summer seasons, ranged between 40 and 60% by weight. Virtually all haddock below 40 cm. and some up to 45 cm. were discarded.

In contrast, during 1958, discards were much below 1951-52 levels. While haddock of about 30 cm. in length were numerous on the grounds (survey results), they were not being taken by the large-mesh nets of 4 1/2 inches or more (Figure 2B). These large-mesh nets were effectively selecting only the larger haddock.

Most of the haddock being caught by the large-mesh nets in 1958 were being landed (Figure 2B). Culling practices have changed quite markedly since 1952. Some haddock are now being saved round, and for these virtually all fish down to 38 cm. are being saved. Even when haddock are gutted, most haddock down to 40 cm. are now saved. On three of the 1958 commercial trawler trips, during which all haddock were being gutted, only 3 to 7% of the haddock by weight were discarded. On trips where most haddock were landed as round fish, discards were only 2 to 4% by weight. For the small portion of these latter trips where haddock were gutted for landing, 33 to 37% by weight were discarded (much less accurate estimates because of sample comparison difficulties).

It appears that large-mesh nets of 4 1/2 inches or slightly more are releasing virtually all haddock below commercial size. Probably some haddock released could be landed as round haddock, but selection by the 4 1/2-inch mesh approximates the cull for gutted haddock.

Mesher appreciably larger than 4 1/2 inches or the equivalent with other twines, would release fair quantities of marketable haddock. For example, in covered-net experiments during 1958 a manila codend of about 5 inches released 50% of the 41-42 cm. haddock and a double-strand nylon codend of 4 5/16-inch mesh released 50% of the haddock at 42-43 cm. Any advantage of a mesh size larger than 4 1/2 inches or its equivalent would depend on the balance between growth and survival of released haddock of currently marketable size.

Landings: Sizes of haddock landed by commercial trawlers during Quarter III, 1958 and Quarter I, 1959 are shown in Figure 2C. More small haddock, modal sizes between 42-50 cm., were landed in Quarter III than in Quarter I, modal size 48-52 cm. During Quarter I a higher proportion of large haddock, about 55-70 cm., were landed than in Quarter III.

During Quarter III 1958, year-classes '55, '54, and '52 were most important in the landings. Ages of haddock in Quarter I 1959 landings have not been determined yet, but it is expected that the same year-classes would be most important.

At the current stage of research surveys in Subarea 4 it is difficult to assess, even in general terms, the size of year-classes before they are completely recruited to the fishery. However, there are certain general comparisons that can be made between survey catches and commercial landings.

The 1952 year-class has been particularly large and important to the fishery since the summer of 1956 when these haddock were taken in quantity as 4-year-old fish. It would appear that they are still numerically almost equal to the 1955 and 1954 year-classes and much greater than the 1953 year-class. It seems justifiable to conclude that none of these latter three year-classes are outstanding. However, as yet we are not able to suggest how far they deviate from the mean year-class size.

Haddock of the 1956 and 1957 year-classes were numerous in the survey catches, but data are lacking to provide relative abundance estimates for these young fish. It is hoped that continued survey results will provide such information and eventually allow the development of a relationship between abundance of these early stages and later recruitment to the fishery.

