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Document No.20ANNUAL MEETING - MAY/JUNE 1960Predictions of Cod Fishery in Subdivision 4T for 1960

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Cod surveys from research vessels using otter trawls with fine-mesh covers were carried out in Subdivision 4T (southwestern Gulf of St. Lawrence) since 1957. The size and age compositions of cod caught in surveys during one season are a good indication of commercial landings in the following season, and the main features of the commercial dragger fishery may be predicted one year in advance.

A comparison of sizes and ages of cod landed (Fig. 1) from 1957 to 1959 suggests that the dragger fishery in Subdivision 4T is rapidly changing to a small-cod fishery. Cod from 7 to 11 years old (60 cm and above) made up more than 60% of the landings in 1957. In 1959 only 20% of the landings were between ages 7 and 11, the bulk of the landings being 5- and 6-year-old fish.

Survey catches of the 3rd quarter (August-October) of 1957 showed that the 1954 year-class was dominant as 3-year-olds (mean length at 36 cm). That year-class was also dominant in the 1958 survey catches and began to appear in the 1958 landings as 4-year-olds. On the basis of the 1958 survey catches it was predicted that the 1954 year-class would replace the 1953 year-class as the dominant one in the 1959 landings. That this was the case is shown in Figure 1. The 1954 year-class was almost fully recruited and dominated the landings as 5-year-olds (mean length at 50 cm).

Figure 1 further shows that the 1955 year-class was dominant as 4-year-olds in the survey catches of 1959. The 1955 year-class will be recruited to the fishery as 5-year-olds in 1960. It is expected that the 1955 year-class will replace the 1954 year-class as the dominant one in the 1960 landings, as indicated at the bottom of Figure 1. No increase in the average sizes landed is expected. In fact, average sizes of cod landed in 1960 may be smaller than those landed in 1959. Age determination of otoliths collected in 1959 indicates that the mean lengths of nearly all year-classes were appreciably smaller in 1959 than in 1958, as seen in the accompanying table.

As seen in the table, the mean length of the 1954 year-class increased by about 4 cm between ages 4 and 5. If no change in growth rate occurs, the 1955 year-class, which is expected to be the dominant one in the 1960 landings, should have a mean length of about 45 cm at age 5, compared with 50 cm for the 1954 year-class in 1959, i.e., at age 5.

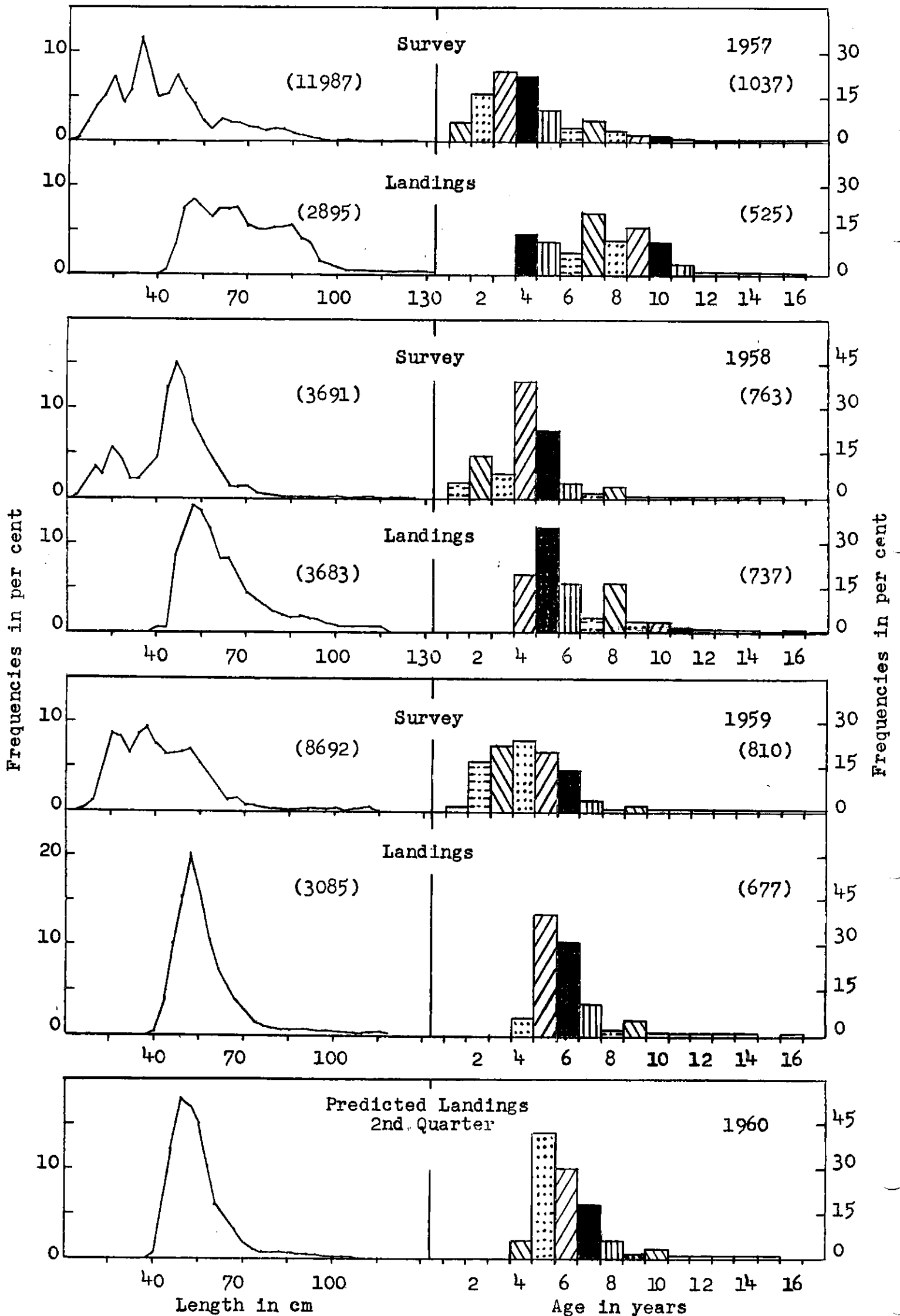


Fig. 1. Size and age compositions of cod caught with covered codend (survey) and landed by commercial draggers in Subdivision 4T during the 3rd quarters (August-October) 1957 to 1959, with predictions for the 1960 fishery.

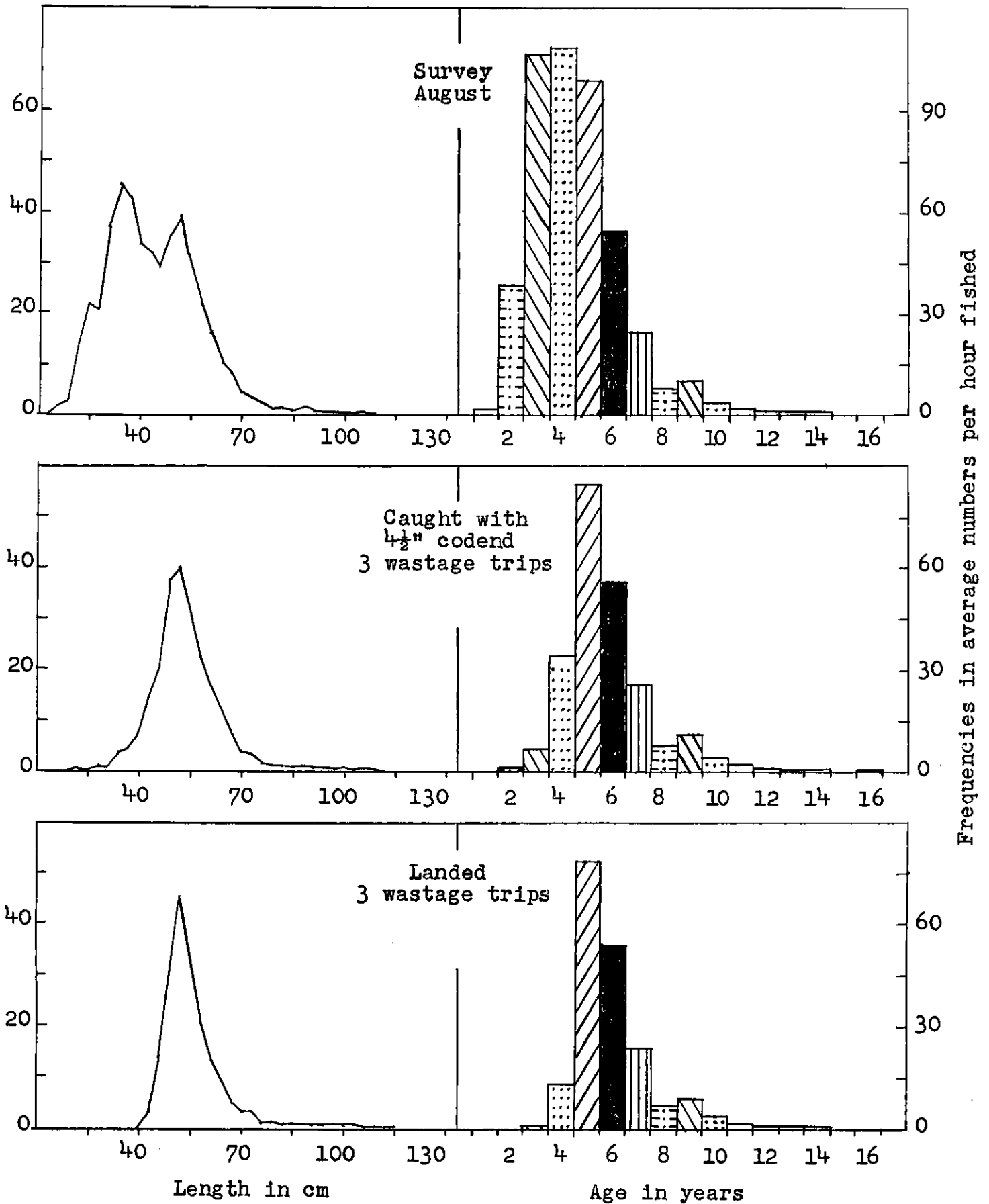


Fig. 2. Size and age compositions of cod caught with covered codend (August survey), caught with 4½-inch mesh codends and landed (3 wastage trips, July 28-September 4) in Subdivision 4T in 1959. Numbers of fish above 50 cm were equalized and the frequencies expressed in average numbers per hour fished.

Age	3rd quarter 1958		3rd quarter 1959	
	No. of otoliths	Mean length in cm	No. of otoliths	Mean length in cm
1	63	19	10	18
2	85	26	44	25
3	72	39	69	33
4	193	46	95	40
5	172	53	124	50
6	54	59	135	56
7	26	65	95	60
8	61	70	44	68
9	14	75	104	72
10	9	87	35	75
11	5	83	24	80
12	3	96	20	86
13	1	106	5	98
14			3	96
15	1	130	-	-

Discards

Measurements at sea and at the wharf during three wastage trips in Subdivision 4T between July 28 and September 4, 1959, indicated that cod wastage was rather high--20% by numbers and 16% by weight--during that period, compared with 3% by numbers and 1% by weight during four trips made in June and the first part of July. (See ICNAF Doc. No. 3, Ser. No. 704, B. Meet. f. 2 and 3.) Size and age compositions of cod caught and landed during the July 28-September 4 trips are shown in Figure 2. Size and age compositions of cod caught with a covered codend during the August survey in the same area are also shown for comparison. Numbers of fish above 50 cm in both commercial and survey catches were adjusted to numbers of fish landed during these three trips. From Figure 2 it is seen that about 95% of the 3-, 60% of the 4-, and 8% of the 5-year-old cod caught with $4\frac{1}{2}$ -inch mesh codends were discarded during the latter part of the 1959 season. If the slow growth rates observed in 1959 persist in 1960, it is anticipated that the discards of cod at sea will be even higher in 1960 than during the July-September period of 1959, assuming no change in culling practices at the plant. Presumably all 3-year-olds caught will be discarded. The 4- and 5-year-olds will be discarded at the rate of about 70 and 10%, respectively.