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AGE, LENGTH, AND MATURITY OF ADULT HERRING

IN SUBAREAS 4 AND 5, 1967

by

Frank E. Perkins  
U.S. Bureau of Commercial Fisheries  
Biological Laboratory  
W. Boothbay Harbor, Maine 04575

A comparison was made of year class contribution, length, and gonadal development of adult herring collected during 1967 from sub-areas 4 and 5. Cruises were made to Georges Bank in June, September and October; samples from Nova Scotia and Coastal Gulf of Maine were taken from fishermen's landings between April and November. A cruise to Georges Bank was also made in April, but foul weather precluded our sampling. Analysis was based on the following samples:

<u>Area</u>	<u>No. of Samples</u>	<u>No. of Herring</u>
Georges Bank	15	1,237
Coastal Gulf of Maine	45	3,846
Nova Scotia	28	2,106
Total	88	7,189

Year Class Contribution: On Georges Bank the 1961 year class fish dominated the catches for the three months of sampling (Fig. 1). Most of the June samples were from the southern slopes of the Bank, and the majority of the September-October samples were from the northern and western slopes. In June the 1961 year class was followed by the 1962 and 1963 year classes; in September and October the 1960 and 1962 year classes were second and third in numbers contributed. The 1963 year class equaled the 1962 year class in the September samples, however.

On the Coastal Gulf of Maine the 1963 year class fish were most numerous, followed by the 1961 and 1960 year classes. The strong 1960 year class of past years did place higher than the other year classes in the months of May, August, and October, with the 1961, 1962, and 1963 year classes nearly equaling it in May, with its nearest competitor in October, the 1961 year class, falling 19 percent below it. In November Coastal samples were from the western section of the Gulf. The samples collected from the Cape Cod Bay area in particular, showed a high incidence of age group III, which accounts for the predominance of the 1964 year class.

In Nova Scotia the 1961 year class fish were the most numerous, followed closely (within 2 percent) by the 1960 year class. Age group VI and older fish prevailed in Nova Scotia for the months sampled, while the Georges Bank and Coastal Gulf samples showed a trend toward younger fish.

(over)

Length Frequency Distribution: In 1967 the maximum and minimum total lengths of herring from Georges Bank, Coastal Gulf of Maine, and Nova Scotia for age groups III through VIII+, were 20.3-35.0, 17.4-37.1, and 20.6-39.1 cm., respectively. The mean lengths of the fish from the three areas were similar for any given age group, with little variability (Table 1).

Gonadal Development: The maturity stages of the fish from Georges Bank and Coastal Gulf of Maine were nearly the same for comparable months (June, September, and October). In both areas the peak of spawning occurred in October (Fig. 2). The onset of spawning on Georges Bank probably was slightly later than in Coastal Gulf of Maine, as no herring larvae were obtained on the September cruise. Some inconsequential spring spawning (less than 2 percent) was in evidence along Coastal Gulf of Maine (April and May). The Nova Scotia fish differed from the Georges Bank and Coastal Gulf of Maine fish by showing a greater amount of autumn spawning earlier in the season, with the peak probably occurring between mid-September and mid-October.

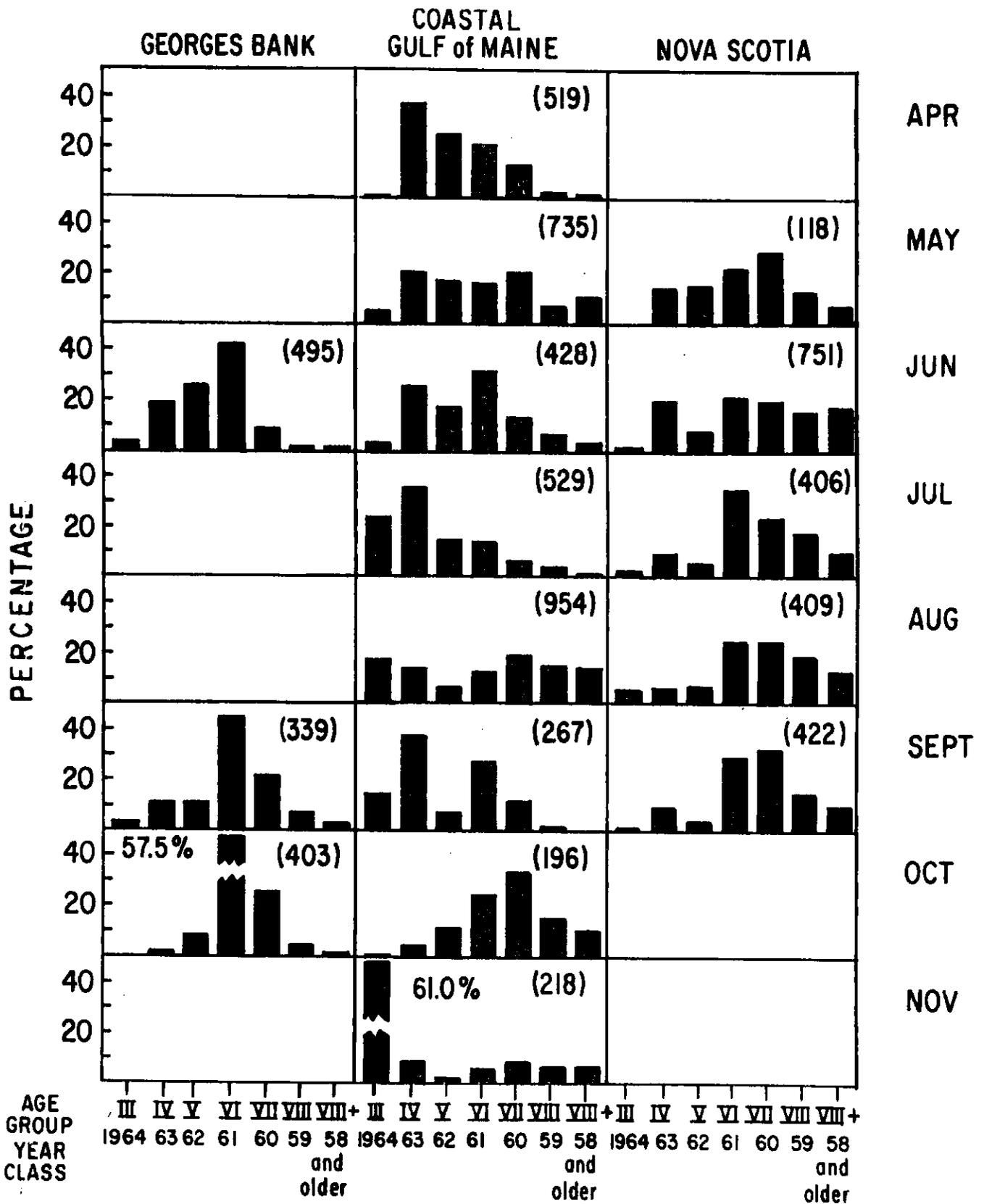


Figure 1. Age composition of herring from Georges Bank, Coastal Gulf of Maine and Nova Scotia 1967. Parenthetical figures denote numbers of fish treated.

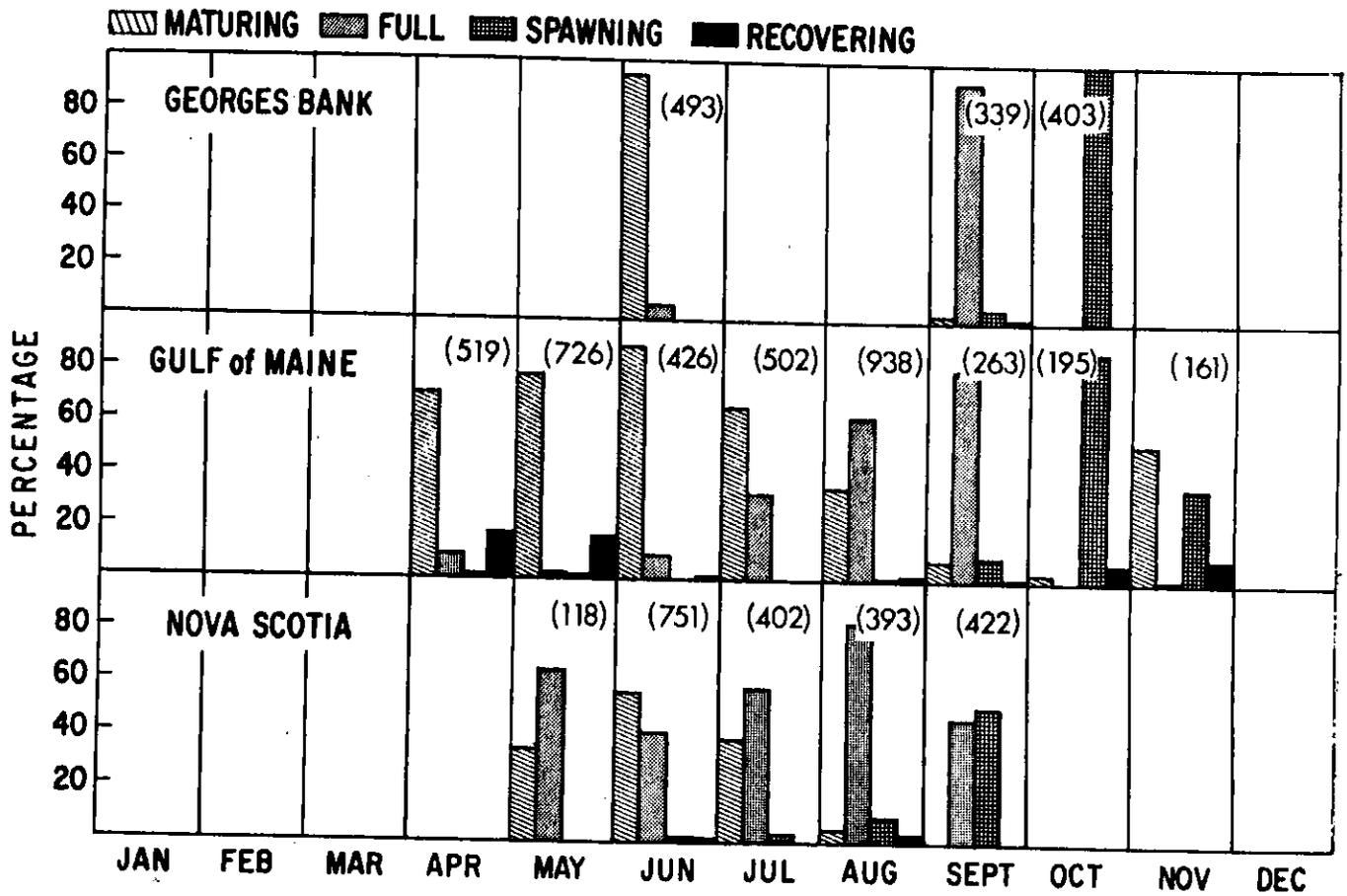


Figure 2. Gonadal stages of herring from Georges Bank, Coastal Gulf of Maine and Nova Scotia, 1967. Histograms follow the order shown in legend. Parenthetical figures denote numbers of fish treated.

Table 1. Mean lengths by month of herring of various year classes from Georges Bank (GB), Coastal Gulf of Maine (GM), and Nova Scotia (NS), 1967.

YEAR CLASS	AGE-GROUP	AREA	MEAN LENGTHS BY MONTH							
			APR.	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.
1964	III	GB	--	--	23.6	--	--	25.3	--	--
		GM	23.2	22.6	24.6	24.5	25.1	24.7	25.6	24.5
		NS	--	--	23.7	23.0	22.7	25.7	--	--
1963	IV	GB	--	--	27.1	--	--	27.7	27.4	--
		GM	26.1	26.0	26.3	27.1	27.4	27.1	27.6	27.1
		NS	--	26.8	25.9	27.1	27.2	27.6	--	--
1962	V	GB	--	--	28.7	--	--	29.2	29.0	--
		GM	28.1	28.2	28.7	28.8	29.0	28.8	29.2	29.1
		NS	--	28.4	28.8	29.3	29.3	29.4	--	--
1961	VI	GB	--	--	30.3	--	--	30.4	30.5	--
		GM	29.6	29.7	30.4	30.6	30.7	30.5	30.7	30.6
		NS	--	29.9	30.3	30.7	30.7	30.7	--	--
1960	VII	GB	--	--	31.5	--	--	31.8	31.7	--
		GM	30.9	31.2	31.6	31.8	31.9	31.8	32.2	32.2
		NS	--	31.5	31.6	31.9	32.0	32.0	--	--
1959	VIII	GB	--	--	32.7	--	--	33.0	33.0	--
		GM	32.2	32.6	32.7	32.9	33.0	33.0	33.1	33.2
		NS	--	32.8	32.8	32.9	33.1	33.2	--	--
1958 and older	VIII+	GB	--	--	33.8	--	--	34.2	34.2	--
		GM	33.6	34.3	34.3	34.3	34.6	--	34.7	34.4
		NS	--	34.2	34.4	34.4	34.5	35.0	--	--