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AGE, LENGTH, AND MATURITY OF ADULT HERRING

IN SUBAREAS 4, 5, AND 6, FOR 1968

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 in 1968 from subareas 4, 5, and 6. Two cruises were made, one in September and one in October, to the Georges Bank area, where samples were collected. Samples from Coastal Gulf of Maine, and Nova Scotia were taken from fishermen's landings in May through December. In subarea 6, samples were obtained from the U.S.S.R. vessel Pallada, the U.S. research vessel Albatross IV, and from fishermen's landings February through April. Analysis was based upon the following samples:

<u>Area</u>	<u>No. of Samples</u>	<u>No. of Herring</u>
Georges Bank	27	894
Coastal Gulf of Maine	51	4,489
Nova Scotia	27	2,048
Area 6	<u>15</u>	<u>781</u>
Total	120	8,212

Year Class Contribution: The age composition of fish from the study areas are depicted by month for the periods samples were obtained (Fig. 1).

In the Georges Bank area catches were scattered and small. The 1962 year class was dominant in these samples, followed by the 1963 and 1961 year classes. This is not to say that the 1962 year class of herring was dominant for the year, because it is unlikely that the limited sampling was representative of the Georges Bank stock. The data should be useful in determining the age composition when pooled with samples from other countries.

In the Gulf of Maine the 1961 year class had the highest percentage in the samples. This was followed closely by the 1963 and 1962 year classes, respectively. The older fish were more prevalent in the samples earlier in the year (May-July) with the younger fish appearing in greater numbers later on (Aug.-Dec.). In August and December the 1965 year class dominated, with the 1963 and 1964 year classes next. The high incidence of age group III fish later in 1968 can be attributed to an abundance of small fish from the eastern section of the Gulf, and the Cape Cod Bay area. This was also true of the Cape Cod Bay area of the Gulf in 1968 and will be monitored during the coming season.

Younger fish seemed to be more numerous in Nova Scotia in 1968. The 1963 year class appeared greater (1961 year class in 1967), on a percentage basis, in the samples obtained, with the 1964, 1962 and 1961 following.

In sample from subarea 6 older fish generally prevailed, and the 1961 year class was first, followed by the 1962 and 1960 year classes. Here as on Georges Bank the samples were small and diffused; ranging offshore from Long Island (N.Y.) to Chesapeake Bay.

Length-Frequency Distribution: The mean lengths of the fish from the four subareas followed the general pattern of past years. In 1968 the minimum and maximum total lengths of herring from Georges Bank, Coastal Gulf of Maine, Nova Scotia, and subarea 6 for age groups III through VIII+, were 23.8-35.9, 19.6-39.0, 18.5-37.8, and 12.9-35.8 cm., respectively (Table 1).

Gonadal Development: The gonadal condition of the specimens treated from all areas of study, except area 6, indicated that spawning took place earlier in 1968 than it did in 1967 (Fig. 2).

In the Georges Bank area spawning probably was three weeks to a month earlier, reaching a peak during the last of August and early September. To further augment this conclusion herring larvae were caught in September of 1968 in contrast to an absence of captures during the corresponding cruise period for 1967.

Table 1. Mean lengths by months of herring of various year classes from Georges Bank (GB), Coastal Gulf of Maine (GM), Nova Scotia (NS), and ICNAF area 6, 1968

YEAR	AGE	AREA	JAN.	FEB.	MAR.	APR.	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.
1965	III	GB	--	--	--	--	--	--	--	--	25.5	25.1	--	--
		GM	--	--	--	--	23.7	23.5	24.2	25.0	24.9	25.1	24.3	23.3
		NS	--	--	--	--	23.7	23.1	25.1	24.4	25.9	--	--	--
		A6	--	--	19.5	--	--	--	--	--	--	--	--	--
1964	IV	GB	--	--	--	--	--	--	--	--	27.1	27.1	--	--
		GM	--	--	--	--	26.0	26.8	26.8	27.3	27.3	27.1	26.8	27.6
		NS	--	--	--	--	26.2	26.7	26.6	27.0	26.6	--	--	--
		A6	--	26.4	25.3	--	--	--	--	--	--	--	--	--
1963	V	GB	--	--	--	--	--	--	--	--	29.1	29.2	--	--
		GM	--	--	--	--	27.5	28.5	28.6	28.9	28.9	29.0	28.9	29.5
		NS	--	--	--	--	28.3	28.4	28.4	28.8	28.7	--	--	--
		A6	--	27.7	27.6	--	--	--	--	--	--	--	--	--
1962	VI	GB	--	--	--	--	--	--	--	--	30.3	30.8	--	--
		GM	--	--	--	--	30.3	30.5	30.6	30.5	30.7	30.6	30.6	30.6
		NS	--	--	--	--	30.1	30.2	30.0	30.5	30.7	--	--	--
		A6	--	29.2	29.5	28.7	--	--	--	--	--	--	--	--
1961	VII	GB	--	--	--	--	--	--	--	--	31.7	31.8	--	--
		GM	--	--	--	--	31.6	31.7	31.8	31.7	31.8	32.0	31.9	32.3
		NS	--	--	--	--	31.6	31.7	31.7	32.0	31.8	--	--	--
		A6	--	30.5	30.5	31.1	--	--	--	--	--	--	--	--
1960	VIII	GB	--	--	--	--	--	--	--	--	32.9	32.6	--	--
		GM	--	--	--	--	32.8	32.8	32.8	32.8	33.1	33.0	32.8	33.2
		NS	--	--	--	--	32.6	32.8	32.7	33.1	32.7	--	--	--
		A6	--	31.8	32.1	32.7	--	--	--	--	--	--	--	--
1959 and older	VIII+	GB	--	--	--	--	--	--	--	--	34.6	33.8	--	--
		GM	--	--	--	--	34.4	34.1	34.2	34.0	34.5	33.8	34.2	33.7
		NS	--	--	--	--	34.9	34.6	34.2	34.9	34.5	--	--	--
		A6	--	33.4	33.3	34.4	--	--	--	--	--	--	--	--

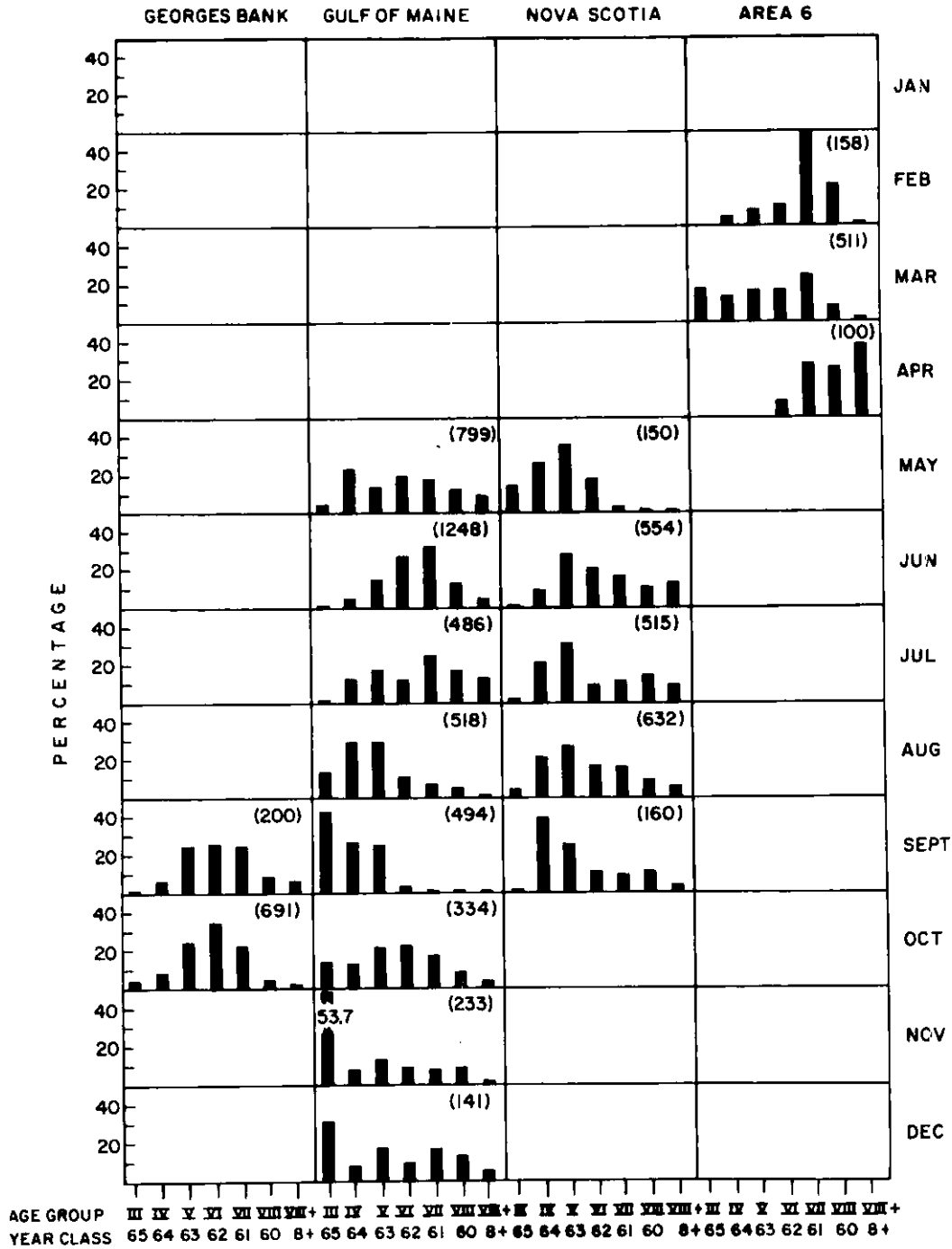


Figure 1. Age composition of herring from Georges Bank, Coastal Gulf of Maine, Nova Scotia, and subarea 6, 1968. Parenthetical figures denote numbers of fish treated.

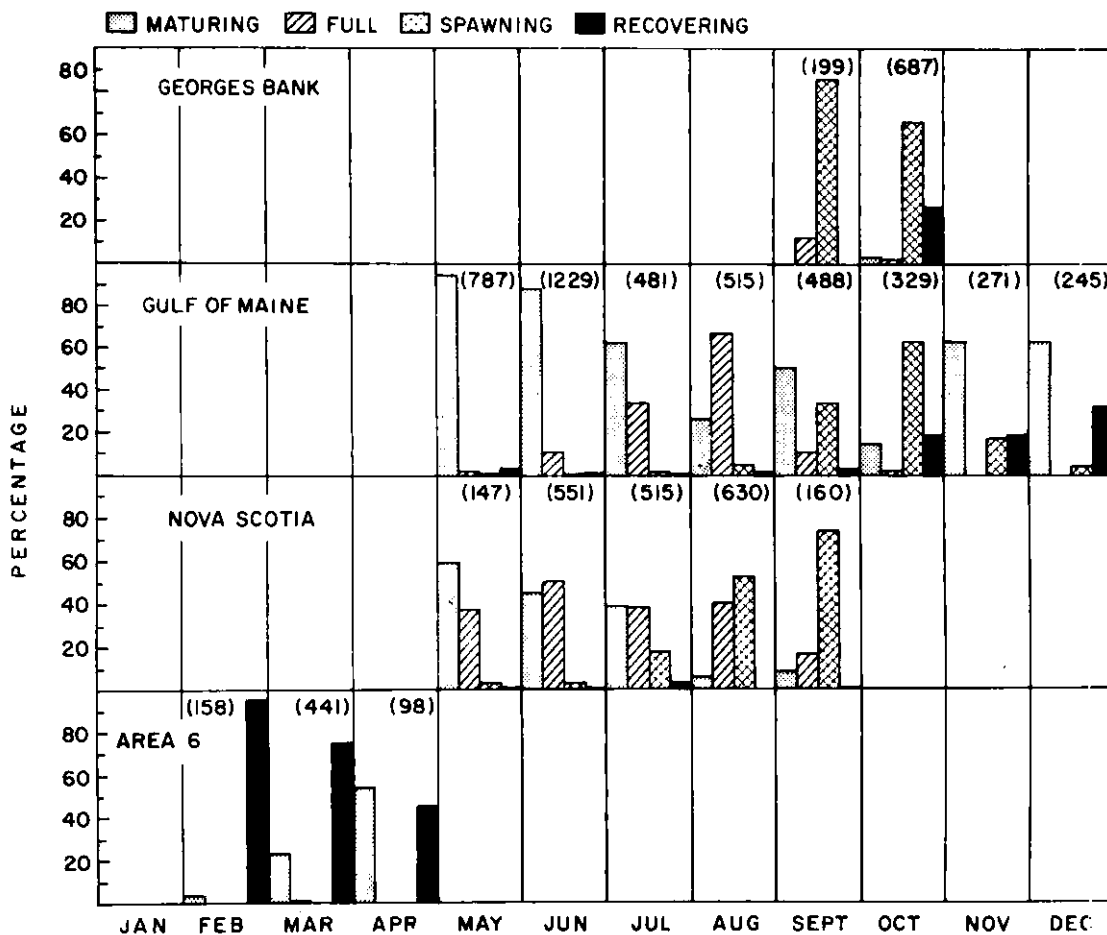


Figure 2. Gonadal stages of herring from Georges Bank, Gulf of Maine, Nova Scotia, and subarea 6, 1968. Histograms follow order shown in legend. Parenthetical figures denote numbers of fish treated.