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Review Of Canadian Herring Fishery And Research

In The ICNAF Area 1963

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The Fishery

In 1963 herring landings in the ICNAF area amounted to 114,112 metric tons--2,716 metric tons more than in 1962 but 5,253 metric tons less than the long-term (1939-60) average.

The 1963 catch in Subarea 3 was 5,963 metric tons as compared with 5,278 metric tons in 1962.

In Subarea 4 the Gulf of St. Lawrence catch increased from 35,616 to 40,834 metric tons; the catch on the Atlantic coast of Nova Scotia increased from 8,460 to 9,633 metric tons and the catch in the Bay of Fundy decreased from 62,042 to 57,682 metric tons.

No herring landings were made from Subarea 5 in 1963.

Research

In support of commitments made to ICNAF, a study of the size composition of herring was carried out in the Bay of Fundy, in southwest Nova Scotia, and on Georges and Browns Banks. In addition studies of the abundance and distribution of herring larvae that have been occupying our attention for several years were continued in the Gulf of St. Lawrence and in the Bay of Fundy.

Subarea 4

Herring were sampled for length and weight and otoliths were taken for age determinations from both sides of the entrance to the Bay of Fundy. On the New Brunswick side of the Bay of Fundy a total of 87 samples consisting of 29,152 fish were obtained. Most of the fish (17,818) were caught in the West Isles and East Charlotte regions of Charlotte County. However, there were 4,711 fish from West Charlotte, 4,665 from Grand Manan and 1,958 from Saint John. The average length for all regions for the year was 14.5 cm with about 250 "sardine" herring being sampled each month.

During January and February most of the samples were from purse-seine-caught fish and these had average lengths of from 11.6 to 14.5 cm. The weir-caught fish sampled in April and May had smaller average lengths (10.4 to 11.9 cm) whereas those taken during the latter part of the season (August and September) were considerably larger (14.0 to 19.9 cm).

On the Nova Scotia side of the Bay of Fundy, herring samples were obtained from May to October but only 4 samples (595 fish) have been examined to date. Samples from the Yarmouth area in May, July and August varied in mean length from 19.8 to 32.6 cm with an overall mean of 30.0 cm.

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Subarea 4 (Cont'd)

Studies of the age composition of these herring samples are incomplete. However, the Bay of Fundy sardines are mostly 1- and 2-year-old fish and seldom if ever do more than four year-classes appear in any of the samples.

Northumberland Strait. Plankton cruises have been carried out in Northumberland Strait in the Gulf of St. Lawrence each year since 1948 for studies of the abundance and distribution of lobster larvae. Since 1951 the collections of plankton have been examined for occurrence of herring larvae and the results give some indication of the variability in abundance of herring larvae in different seasons.

The accompanying table gives the average number of herring larvae per tow and the number of tows examined during the past 13 years. All of these tows were taken with a rectangular 12 ft X 3 ft plankton net towed at the surface and were each of 30-minutes duration. In 1951 and for the years 1958 to 1963 inclusive all of the tows made were examined. In other years (1952-57) only samples of the lobster tows were examined for herring larvae. The separation of tows before and after July 15 was made on

Year	Average catch per tow (Number of tows in brackets)	
	June 16-July 15	July 16-September 30
1951	74.6 (125)	0.0 (213)
1952	1,897.8 (42)	0.2 (64)
1953	855.9 (35)	0.0 (68)
1954	127.4 (36)	0.2 (82)
1955	407.8 (46)	0.0 (50)
1956	31.6 (54)	0.0 (87)
1957	32.5 (73)	1.1 (77)
1958	9.1 (186)	0.0 (294)
1959	1.5 (154)	0.1 (311)
1960	11.6 (182)	0.4 (298)
1961	0.2 (175)	19.3 (293)
1962	2,166.9 (67)	214.4 (189)
1963	117.0 (99)	0.5 (141)

the assumption that larvae caught before July 15 were the result of spring spawnings and those caught after July 15 were the result of summer or autumn spawnings. The majority of the larvae in all catches were less than 20 mm long suggesting fairly recent hatching.

The commercial herring fishery in Northumberland Strait is supported primarily by spawning herring and hence the number of larvae produced in any season might be expected to bear some relationship to the size of the spawning schools. No consistent relationship is apparent in the results to date but it should be noted that commercial catches are not necessarily a reliable measure of the size of the spawning schools. Furthermore, variations in environmental conditions (temperature, salinity, etc.) may be more important for the production of larvae than variations in the abundance of fish.

The abundance of larval herring both in total numbers caught and in average catch per tow was at its lowest level in 1959 when only 252 larvae were taken in 465 tows. By comparison, 79,720 larvae were taken in 106 tows in 1952 and 185,704 larvae in 256 tows in 1962. For spring spawnings the lowest value for herring larvae was in 1961 when the average catch was 0.2 larva per tow for 175 tows.

The herring fishery in the Northumberland Strait area (Kent and Westmorland Counties) has declined in recent years from 12,840 metric tons in 1952 to 908 metric tons in 1961. Since 1961 there has been some improvement with landings amounting to 2,696 metric tons in 1962 and 7,144 metric tons in 1963. The numbers of larvae taken in 1963, however, were less than one-tenth of those taken in 1962.

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Subarea 4 (Cont'd)

Passamaquoddy Bay. The two Prince Stations (Prince 5 and 6) were occupied once each month throughout the year and yielded 4 herring larvae; 2 at Prince 5 (one in March and the other in November) and 2 at Prince 6 in December. These larvae were fall spawned and could have drifted into the area from other spawning grounds. The small numbers of herring larvae found in 1963 confirm earlier results which suggested that little or no spawning occurs in Passamaquoddy Bay.

Southwest Nova Scotia. During a C.N.A.V. Sackville cruise in February, 9 herring larvae were caught. Five were taken off Digby Neck, 1 at the entrance to St. Mary Bay, 1 on the northeast peak of Georges Bank and 2 off Lockport. All but 2 larvae were taken in oblique (20-0 m) tows. The size range of the larvae was 23-42 mm suggesting fall spawning. Twenty-nine oblique tows and 17 vertical tows were taken with a standard 1-metre plankton net.

St. Mary Bay-Bay of Fundy. Three cruises were carried out in the St. Mary-Bay of Fundy area, one in April and two in May, and 1,076 herring larvae were caught.

Herring larvae were present in moderate numbers outside Digby Neck early in April with small numbers in St. Mary Bay. In early May, numbers increased throughout the area with large numbers present in Petite Passage. The presence of larvae decreased by the end of May when only 16 larvae were taken across the mouth of the Bay of Fundy and in St. Mary Bay.

The average number of herring larvae per tow was 16.8 for 60 Isaacs-Kidd tows. In 42 tows with the 1-metre net the average catch was 1.6 larvae per tow. The average size of the larvae was 28.45 mm.

Grand Manan. One plankton cruise was carried out around Grand Manan Island including the Murr Ledge area. Two methods of collection were used; a standard 1-metre plankton net and an Icelandic High Speed sampler.

The high speed sampler was 1,060 mm long with an aperture 90 mm in diameter. It was rigged with a special aluminum ring of 200 mm diameter, the same diameter as that of the main body of the instrument. A silk or nylon gauze bag was fixed to the ring, which in turn was fitted to the tail section by a simple interlocking hook-clamping device. The sampler was towed at a speed of 8 knots and in 17 tows 21 larvae (average size 21.7 mm) were caught. The majority of the larvae were caught in the Murr Ledge area. In comparison, 20 tows with the 1-metre plankton net caught 18 herring larvae (average size 20.3 mm).

Subarea 5

The only studies carried out in Subarea 5 involved fourteen samples of herring obtained from bottom-trawl catches by the A. T. Cameron on Georges Bank in August. These fish varied in length from 18.0 to 39.9 cm (total length) with a mean length of 26.2 cm. Age and maturity data were included in the sampling but are still awaiting examination.

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