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Abundance of Atlantic salmon in New Brunswick rivers in 1973¹

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In 1973 the ban on commercial salmon fishing continued in waters adjacent to the Miramichi, Restigouche and Saint John Rivers, New Brunswick. The reduction in home water exploitation was implemented because data collected from commercial and sport fisheries, and adult and juvenile salmon sampling programs demonstrated that salmon reproduction in the major river systems in New Brunswick had reached a critically low level. Restrictions in home exploitation have increased spawning escapements, with a resultant improvement in salmon reproduction.

The Miramichi River

The 1972 and 1973 commercial fishing ban on the Miramichi drift and trap net fisheries allowed an increased escapement of large salmon into the river, and hence an improvement in potential egg deposition (Fig. 1). Although the overall escapement of salmon and grilse in 1973 was similar to that measured in 1972, the composition in terms of early and late run differs. Late run grilse comprised 6.5% of the total in 1972 and 39% in 1973 (Fig. 2). In 1972, late run large salmon accounted for 19% of the total run, whereas in 1973 this segment accounted for 58% (Fig. 3). The 1973 fall runs of salmon and grilse, however, still remained much below the 1954-60 average. This lack of response in fall run escapements to reduced local exploitation confirms that the local commercial fishery took mostly early run large salmon and grilse.

The run composition in 1973 at the Millbank sampling trap was 32% large salmon and 68% grilse, almost identical to the values recorded in 1972. The average percentage for the period 1961 to 1970 was 18% grilse and 82% salmon; whereas the average for the period 1954 to 1961, was 50% grilse and 50% salmon.

Juvenile Salmon Abundance

A total of 80 electrofishing sites on 26 streams throughout the Miramichi River system was sampled in 1973. Fry densities were approximately three times higher than those found in 1972 (Fig. 4). The overall mean density was 14 per hundred square yards in 1973, versus 4.4 in 1972. Although fry densities increased in 1973, parr densities decreased below 1972 levels, and in fact densities of both small and large parr were the lowest ever recorded.

The Restigouche River

The overall run to the Restigouche River in 1973 is believed to have been somewhat smaller than the run in 1972. A total of 1,556 large salmon was captured by means of an estuarine sampling trap in 1972, versus 1,170 in 1973. Since the mesh size in the trap was not sufficiently small in 1972 to retain grilse, comparisons between the two years for grilse are impossible. With mesh size modifications, the trap caught 326 grilse in 1973.

The Saint John River

Inadequate salmon spawning escapement to the Saint John River system was identified in 1968, and for the period 1969 to 1971 partial restrictions were placed on commercial salmon fishing to improve escapement and to provide broodstock for the newly constructed Mactaquac hatchery. Although some improvement was obtained, a total ban on commercial fishing was necessary in 1972 and 1973 to provide more escapement to the entire river system.

¹ Presented to the ICES/ICNAF Joint Working Party on North Atlantic Salmon, ICES, Charlottenlund, March 1974.

A total of 2,860 large salmon and 3,610 grilse was counted through the fish facilities at the Mactaquac Dam during 1973. The run was composed of more grilse but fewer salmon than in 1972 (Fig. 5). The percentage of fish of hatchery origin increased from 22% of the grilse in 1972 to 49% in 1973, and from 11% of the large salmon in 1972 to 17% in 1973. The increase in the grilse run in 1973 can be almost entirely attributed to Mactaquac hatchery production, derived from the smolt output of 1972.

An additional 1,946 large salmon and 559 grilse were counted through a fish fence on a major tributary below the Mactaquac hydroelectric development. This was the first year a total estimate of the Nashwaak River salmon run was made.

Juvenile sampling by electrofishing has indicated that the 1972 spawning escapement approached the minimum level for optimum seeding of the Saint John River and tributaries. The average fry density sampled in 1973 was 23 fry per hundred square yards, compared to 6 fry per hundred square yards in 1972. Unfortunately, the decrease in the large salmon component in 1973 will once again result in a less than adequate seeding of the river.

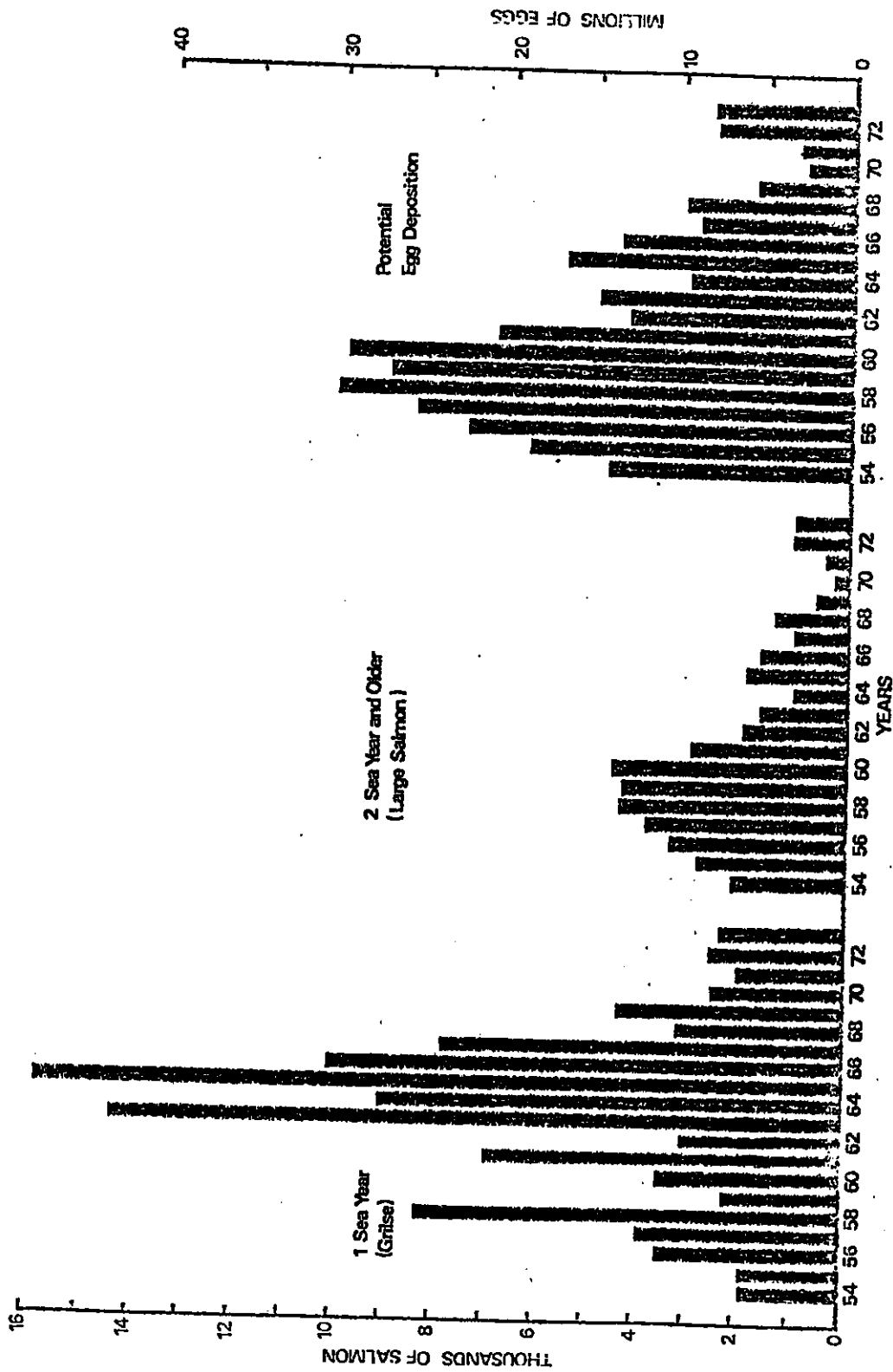


Fig. 1. Atlantic salmon catch at Miramichi adult sampling trap from 1954 through 1973 and potential egg deposition represented by these fish.

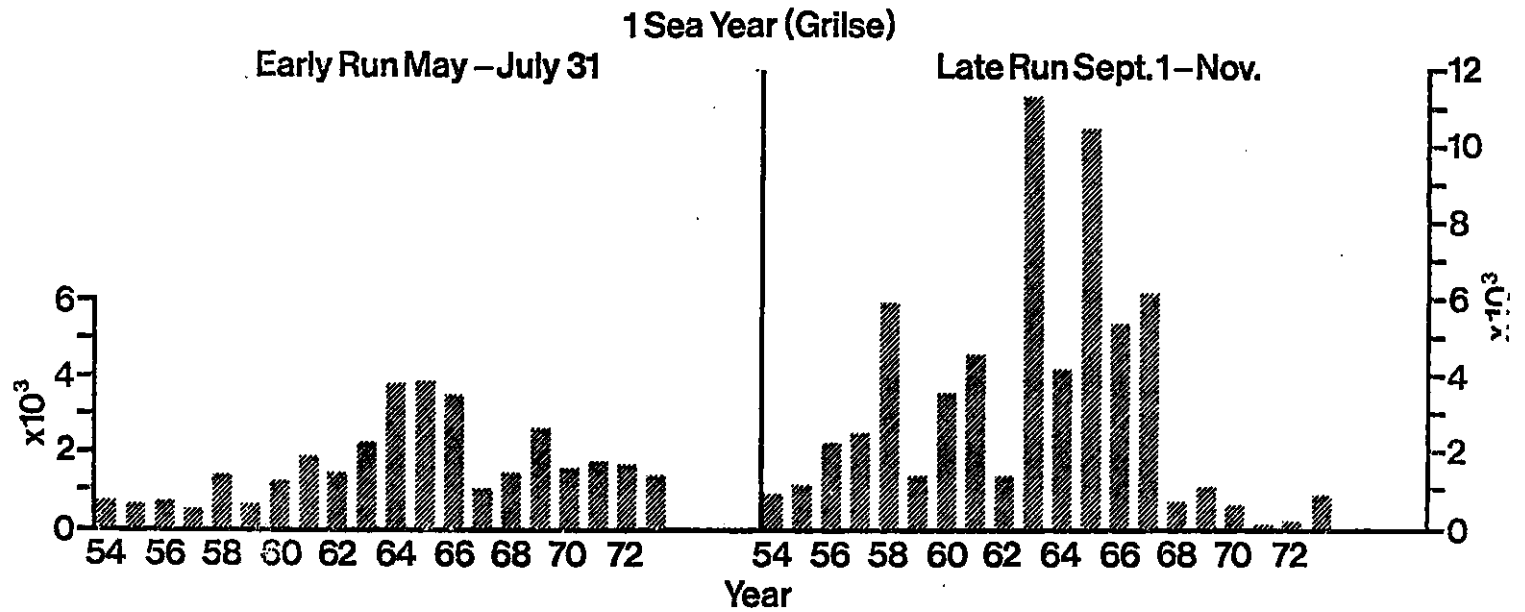


Figure 2. Early-run:late-run grilse catch at Millbank, 1954 to 1973, excluding August catch because of its early-late run composition.

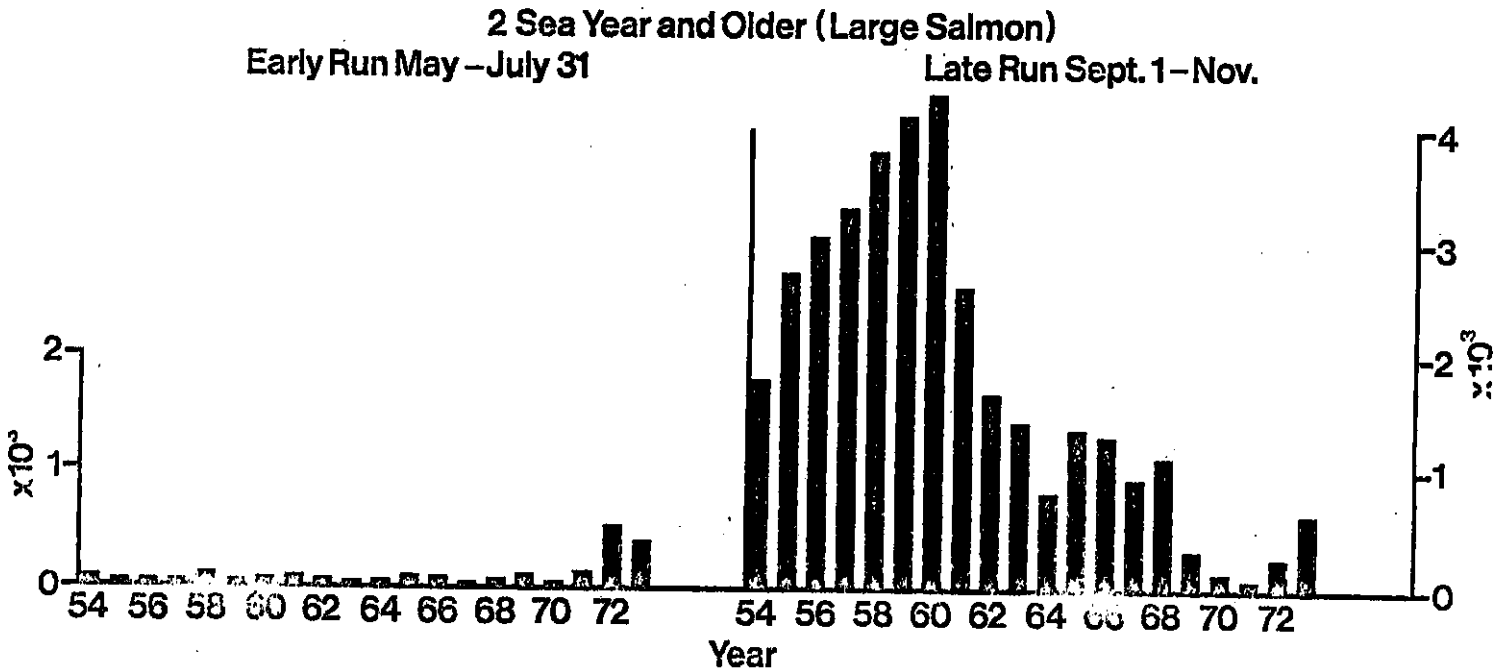


Figure 3. Early-run:late-run large salmon catch at Millbank, 1954 to 1973, excluding August catch because of its early-late run composition.

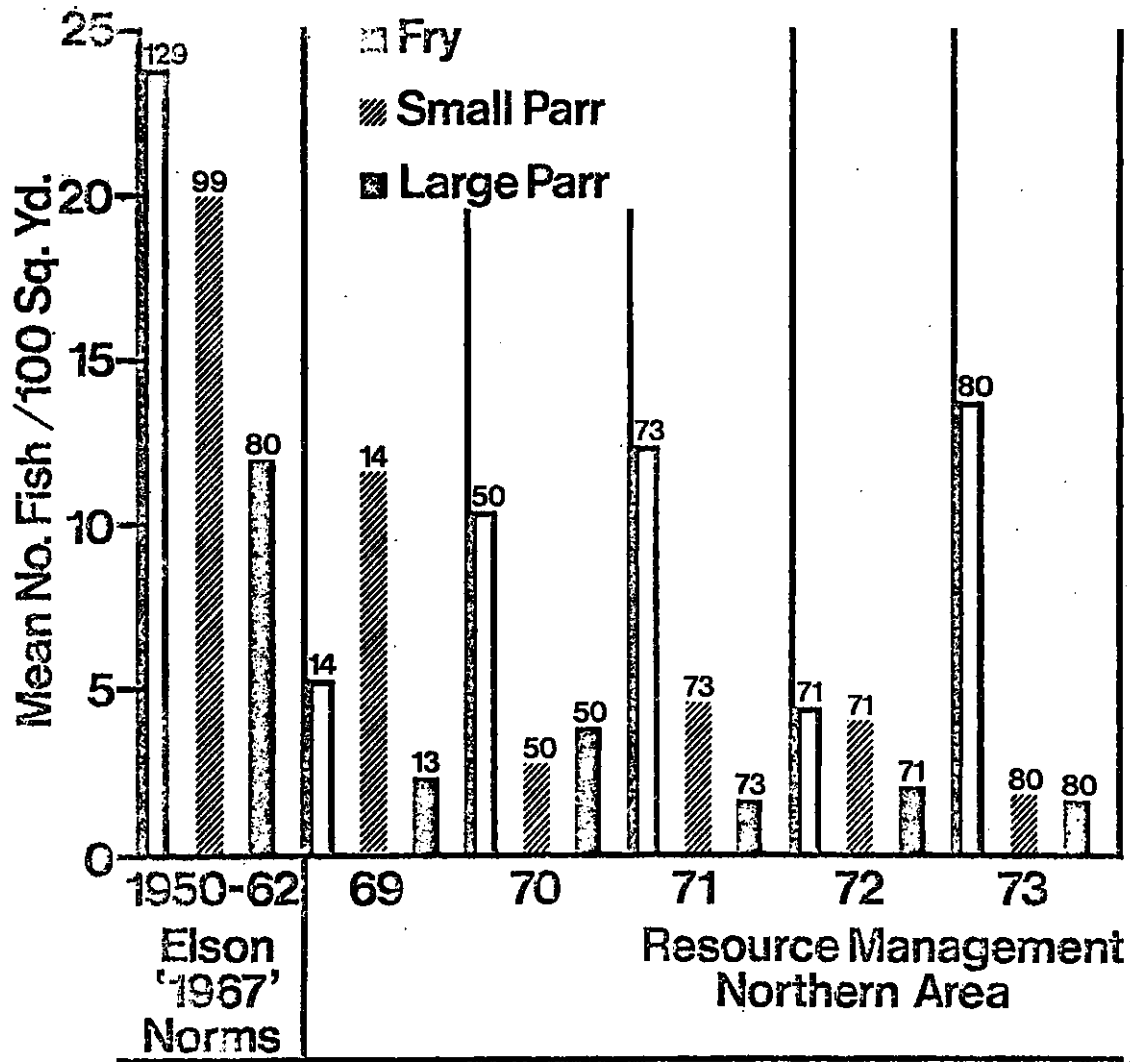


Figure 4. Average yearly juvenile salmon populations per 100 square yards for the Miramichi determined by Resource Development Branch between 1969 and 1973, compared to populations noted by Elson (1967) for the same river. The numbers above each histogram represent the number of stations sampled.

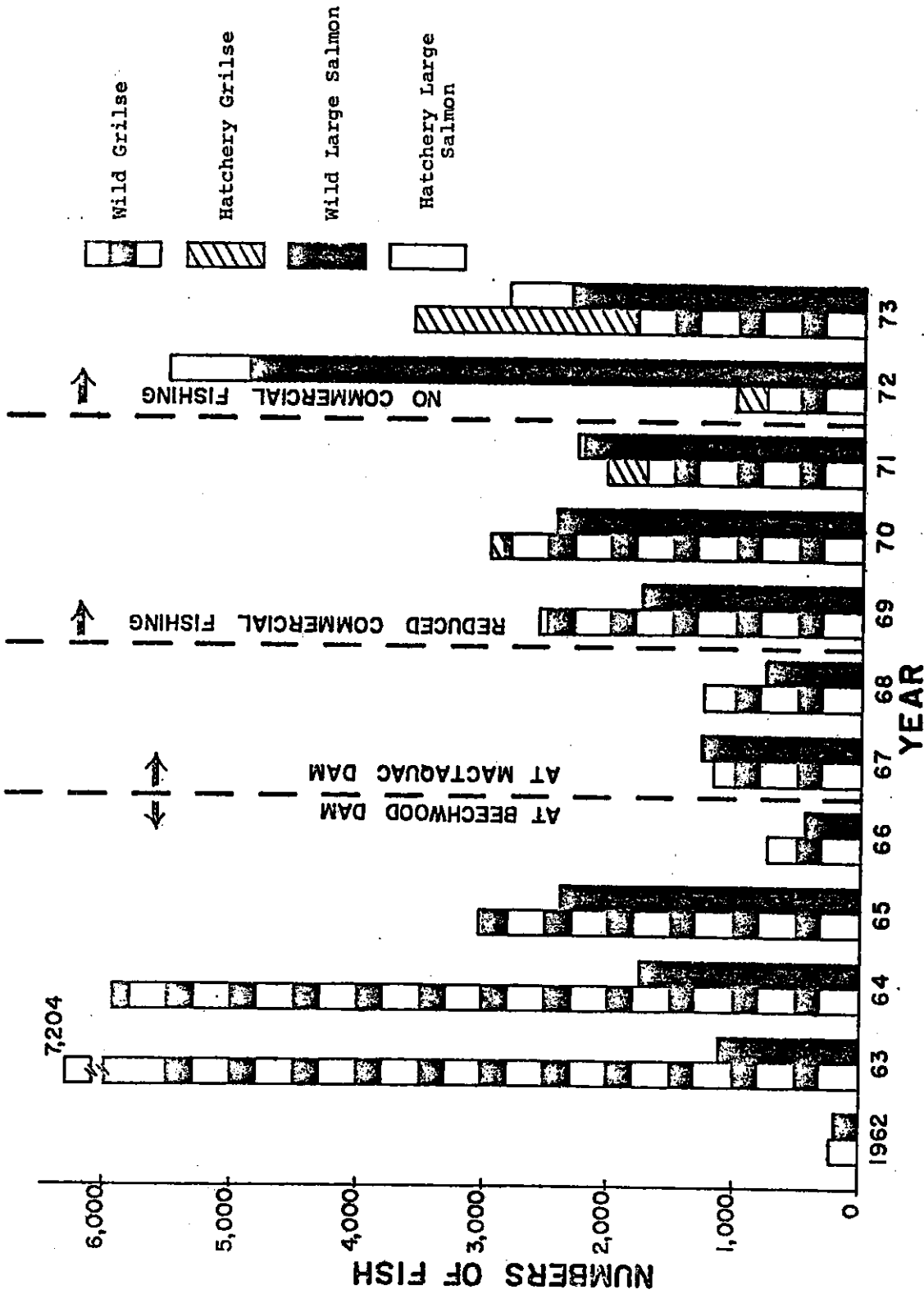


Figure 5. Estimated numbers of wild and hatchery large salmon and grilse reaching Beechwood (1962 to 1966) and Mactaquac (1967 to 1973).