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Methods of Estimating Atlantic Salmon Catch Per Unit Effort for the Maritime Provinces of Canada

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Catch per unit effort data for Miramichi drift nets and trap nets has been documented in an annual series since 1960. This series is continued primarily for the ICES/ICNAF Working Party on North Atlantic Salmon and the method of calculation has not changed since its inception. During the 1970 commercial salmon fishing season precise effort information was collected and incorporated with catch figures to commence a catch per unit effort series which should reflect changes in populations.

Many of the assumptions and methods of calculation used in the original series could result in catch per unit effort figures which would misrepresent population changes. The annual figure for the original series is the average of the mean monthly catch per unit of effort for two types of gear throughout the open seasons for each type. A unit of effort is one trap net or 200 fathoms of drift net. Effort is based on the number of licenses issued, and not on the amount of gear actually fished. For example, in 1970 in one Fisheries Statistical District in the Miramichi area, 33 trap net licenses were issued. There were, in fact, five weeks when no gear was fishing, and at no time in the season were all 33 trap nets fishing at one time. Averaging the mean monthly catch per unit of effort discounts the limited fishing periods at the beginning and end of the season and the compulsory two week tie up period for trap nets in July.

Also, any extension of the open season into another calendar month, such as the 10 day extension into September for trap nets in the Miramichi in 1967, results in the catch in the extended season being divided by an additional month's effort instead of a partial month's effort.

In the original series, catch and effort figures for two types of gear are grouped and only one figure is reported annually. This is accomplished by assuming that the length of gear determines its catchability. Only salmon drift nets and salmon trap nets are considered, and they are treated collectively by equating one 675 fathom drift net to 3.375 trap nets or equating one trap net to 200 fathoms of drift net. In fact, in 1970, the average leader length of trap nets in the Miramichi area was 87 fathoms; therefore, the conversion factor 7.768 should be used instead of 3.375. However, grouping different types of gear by length alone does not necessarily equalize their fishing capabilities.

In 1970, weekly effort data for each type of gear in each Fisheries Statistical District were collected. The number of units fishing, average number of days fished per unit, and the average number of hours fished per unit per day, were recorded weekly for each Fisheries Statistical District and for each type of gear. For each type of gear, the effort in unit days was then calculated by multiplying the average number of units of gear fishing in a week by the average number of days fished in the same week. Effort is then totalled for the month and divided into the monthly landings by that gear type. This catch per unit effort figure is then the monthly average of the catch in pounds per unit day.

This new series will list separately for each Fisheries Statistical District throughout the Maritimes (and grouping of statistical districts into major fishing areas) by each gear type, the following:

1. Landings by month and season,
2. Number of units operating by week,
3. Effort in unit days by week, month and season,
4. Catch per unit effort (lbs. per unit day) by month and season,
5. Number of fishing licenses issued for the season,
6. Average unit effort per day in hours for the season.

These seasonal catch per unit effort figures should then indicate changes in effort or in abundance of salmon entering commercial salmon fisheries throughout the Maritimes during the commercial fishing season. If yearly changes in catch per unit effort are evident in a fishery, effort and catch data can be examined separately. This should then indicate the reason for a change in catch per unit effort.