

Northwest Atlantic



Fisheries Organization

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Information for the Fisheries Commission on Yield-per-recruit

Analysis of the Cod Stock in Divisions 3NO

1. Scientific Council Considerations

When advice with respect to the management, in 1988, of the cod stock in Div. 3NO was provided at the June 1987 Meeting, the Scientific Council indicated its intention to examine future and update, if necessary, the yield-per-recruit analysis which provides the $F_{0.1}$ and F_{max} reference levels of fishing mortality for this stock. The existing analysis was noted as being based on relatively old data. Further consideration of this matter by STACFIS at the present meeting (see Section 2 below) indicated that additional studies are required before a new yield-per-recruit analysis can be accepted. The Council therefore agreed that its advice for the cod stock in Div. 3NO remains the same as presented in its report of the June 1987 Meeting (SCS Doc. 87/21).

2. STACFIS Considerations

A new yield-per-recruit analysis was not possible at the June 1987 Meeting because average weights-at-age were not then available for cod older than age 12 years. Following a recommendation made by the Scientific Council, average weights for ages 13-20 years were calculated from research vessel data. Lengths-at-age were calculated from the data sources cited in SCR Doc. 87/97. Weights-at-age were then estimated by applying a length-weight relationship to the average lengths-at-age. These average weights and the values from the commercial fishery for ages 3-12 years, were included in a yield-per-recruit analysis.

The values of $F_{0.1}$ and F_{max} derived from this analysis were somewhat different from the values (0.18 and 0.22 respectively) used in previous years. It was noted that such calculated values tend to vary as they reflect the normal variability in the estimated weights of age and the estimated proportions of the fishing mortality acting upon the younger (and smaller) cod which are not fully recruited to the fishery. Current estimates of average weights for cod older than 16 years were highly variable perhaps due to infrequent occurrences of these ages in the survey catches. STACFIS concluded that a more detailed examination of the necessary parameters be undertaken before changes in specific yield-per-recruit values are accepted. It was noted that the yield-per-recruit function should be calculated from values consistent with those observed in the stock when it

was at an appropriate size. STACFIS accordingly recommends that the appropriate laboratories in Canada and USSR which have series of research vessel surveys in this area provide the data and perform the necessary yield-per-recruit analyses for presentation at the June 1988 Meeting. Relevant data from the commercial fisheries of all nations for cod in Div. 3NO should also be provided.