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An updated witch assessment for ICNAF divisions 3N and 3Ø

by

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INTRODUCTION

The only fishable concentrations of witch in this area are along the southwest slope of the Grand Bank (3Ø) and around the southern tip of the bank (3N). During the large haddock fishery of the early 1950's and 1960's witch was a fairly substantial by-catch. Since then it has become a by-catch of other species such as cod and American plaice. In the spring when ice conditions are unfavourable to the north, there is some directed effort for witch on the southwest slope of the Grand Bank by the Canadian offshore trawlers. Canada and the USSR account for most of the landings of witch in Divisions 3N and 3O averaging about 9,000 tons annually over the last ten years (Table 1). A total allowable catch of 10,000 metric tons was agreed to at the 1973 and 1974 Annual Meetings of ICNAF and International quotas were allocated for 1974 and 1975.

Materials and Methods

Samples were collected from Canadian (N) commercial trawlers for the years 1974, 1975 and 1976. Samples were from the second quarter for 1974 and 1975, however samples were taken in all four quarters of the year for 1976. Age and length compositions were plotted for each year's data for comparisons (Fig. 1, 2 and 3). Because of differences in age and growth of males and females (Fig. 4), the sexes were treated separately in all the calculations.

It was assumed that the catch compositions for Canada and the USSR were about the same, therefore the numbers caught at age for the total landings were calculated using Canadian age data. These numbers were then used to compute catch curves for the males and females (Fig. 5).

Yield per recruit curves were similar to those used in the previous assessment (Bowering and Pitt, MS 1975) and were computed up to F=2.5 for M=0.15 and 0.20 for males and females separately (Fig. 6). The F values from the 1975 assessment and the F values from the 1974-76 catch curves were both plotted on the appropriate yield per recruit curves.

Results and Discussion

Witch from this stock area enter the fishery at 8 years old (30 cm) and are not fully recruited until around 13 years old (45 cm) (Fig. 1, 2 & 3). The length and age composition did not appear to vary significantly over the three years considered. Except for the third quarter in 1976, the size and age ranges were relatively consistent over all quarters of the year (Fig. 2 and 3). However, considering the fluctuations in proportions of age groups caught in each quarter of 1976, it indicates that the data from a single quarter in 1974 and 1975 may not be entirely representative of the total catch, but are probably reasonably close.

Catch curves from the commercial age composition gave estimates of instantaneous total mortality (Z) of 0.97 and 0.54 for males and females respectively (Fig. 5). The yield per recruit curves (Fig. 6) indicate that only for M=0.15 is there a definitive maximum value so essentially the curves are flat-topped.

For the males the F- value from the 1975 assessment is very close to $F_{0.1}$ for both values of M however, the F value from the 1974-76 catch curves is somewhat above the $F_{0.1}$ level. For the females, both values of F are practically coincidental with $F_{0.1}$ for M-0.15 and very close to $F_{0.1}$ for M=0.20.

Considering the life span of this species, the value of M=0.20 may be rather high for the females but close to the actual value for the males. In any case, the average values of F from the 1974-76 catch curves are relatively close to $F_{0.1}$ which probably represents the average removal of 9,000 tons annually over the past 10 years.

Since the level of removals from this stock are primarily as a by-catch of other fisheries, there are no reports of catches from countries that salt their cod. Also in many cases catches of witch get reported as other flounders. Because of this, the catches in Fig. 1 are minimal. In order to get an accurate fix on F, it is therefore necessary to obtain proper records on discards and catch/effort data for this species.

Year	Canada	France	USSR	UK	Poland	GDR	Others	Total
1966	3,644		3,828		16	4		7,522
1967	2,863		8,565	26	29	20		11,503
1968	1,503	18	9,078					10,599
1969	479	6	4,215					4,700
1970	723	1	6,039					6,763
1971	178	10	14,744		3			14,965
1972	3,419	17	5,738					9,177
1973	4,943	20	1,714	5	9			6,691
1974	2,807	1	5,235	2				8,045
1975	1,137		5,019					6,156
1976	3,036		4,711				39	7,786

References

BOWERING, W.R. and T.K. PITT, 1975. Yield per recruit assessment of witch (*Glyptocephalus cynoglossus*) for ICNAF Divisions 3N and 3Ø. ICNAF Res.Doc. 75/23, Serial No. 3478.

GULLAND, J.A. and L.K. BOEREMA, 1972. Scientific advice on catch levels. ICNAF Res.Doc. 72/26, Serial No. 2717.
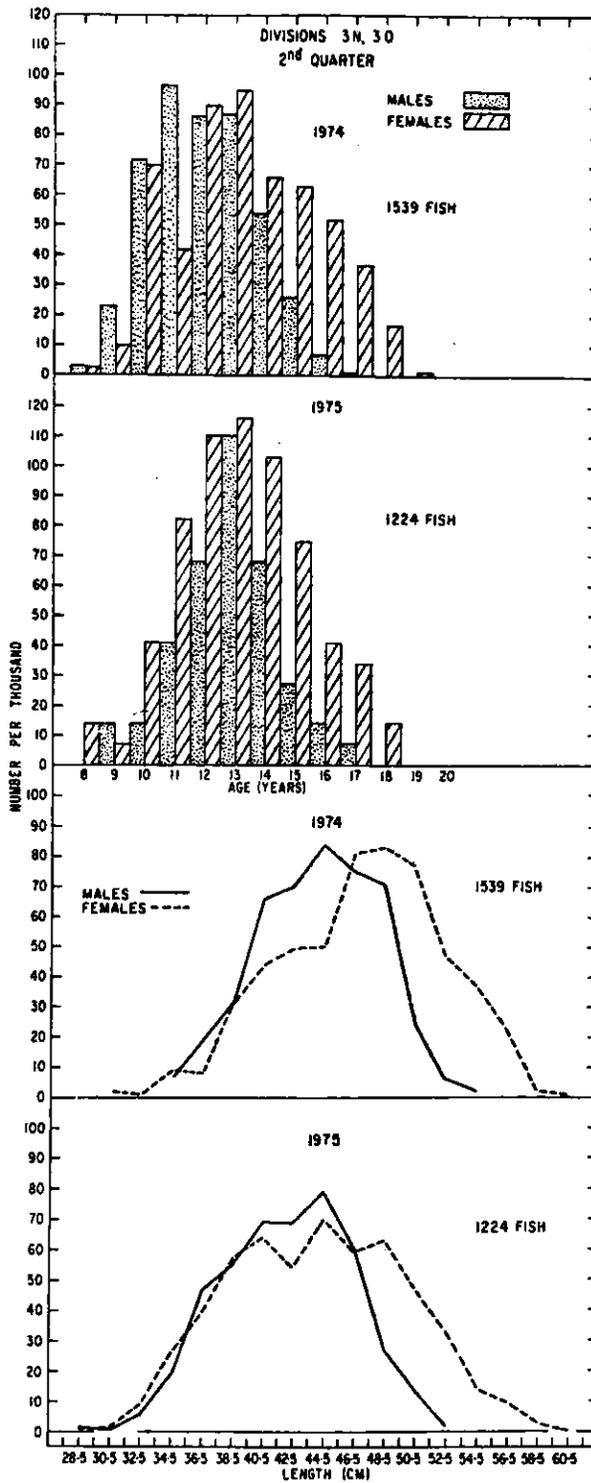
Fig. 1. Age and length distributions for male and female witch from commercial otter trawl in ICNAF Divisions 3N and 3Ø for 1974 and 1975.
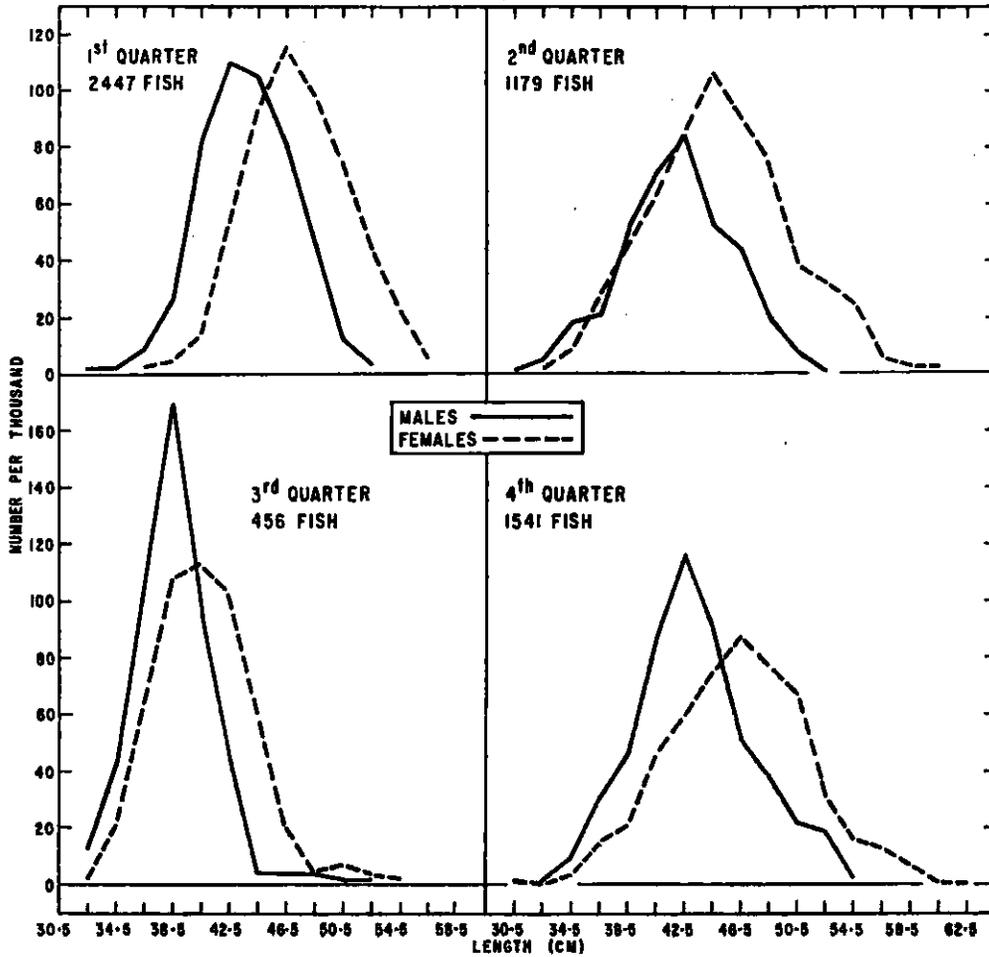
Fig. 2. Length distributions for male and female witch from commercial otter trawl in ICNAF Divisions 3N and 3Ø for each quarter of 1976.
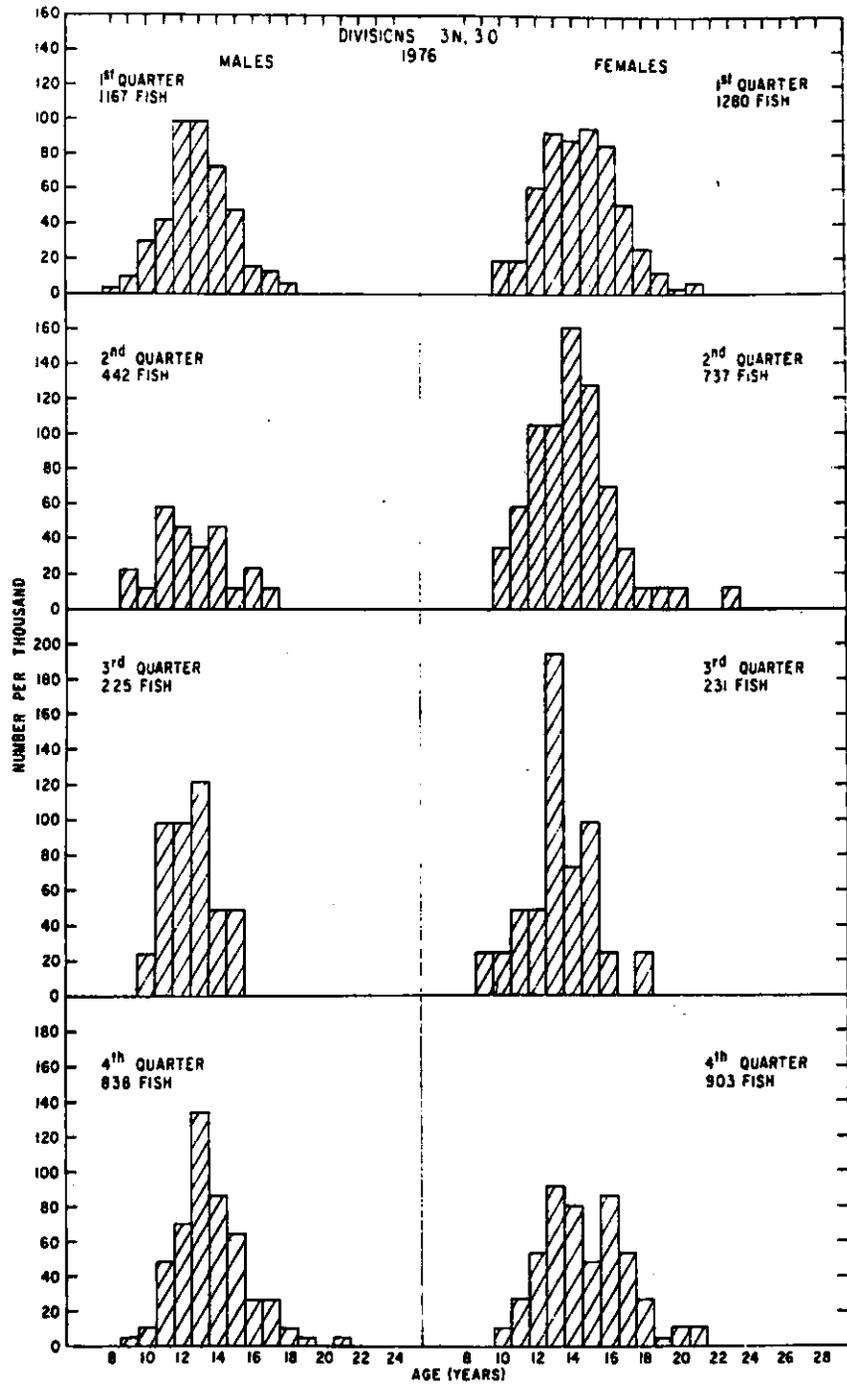
Fig. 3. Age distributions for male and female witch from commercial otter trawl in ICNAF Divisions 3N and 3Ø for each quarter of 1976.
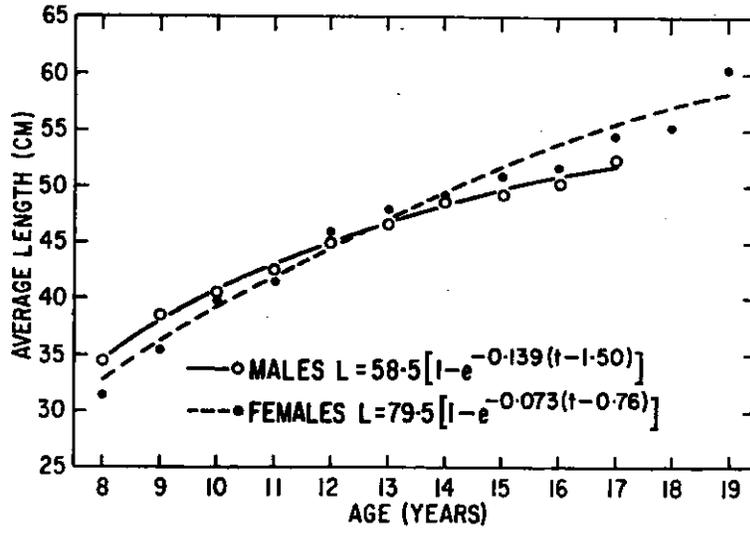
Fig. 4. Growth curves for male and female witch in ICNAF
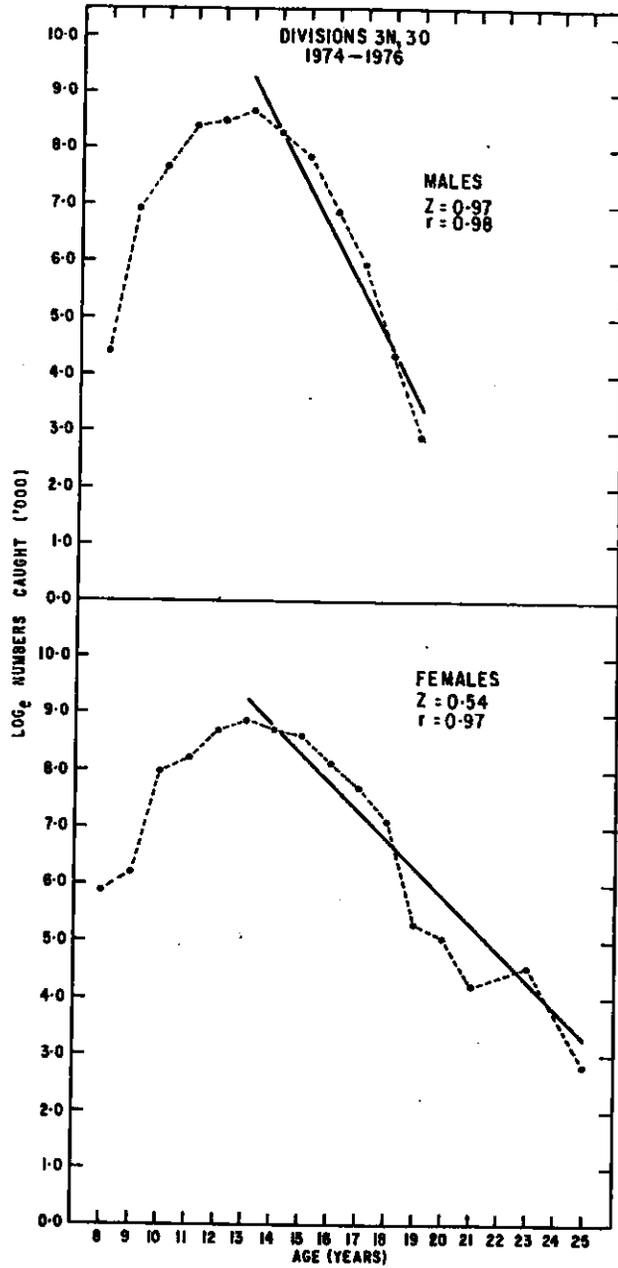Divisions 3N and 3Ø.

Fig. 5. Catch curves for male and female witch of ICNAF Divisions 3N and 3Ø computed from 1974-76 combined commercial otter trawl data.
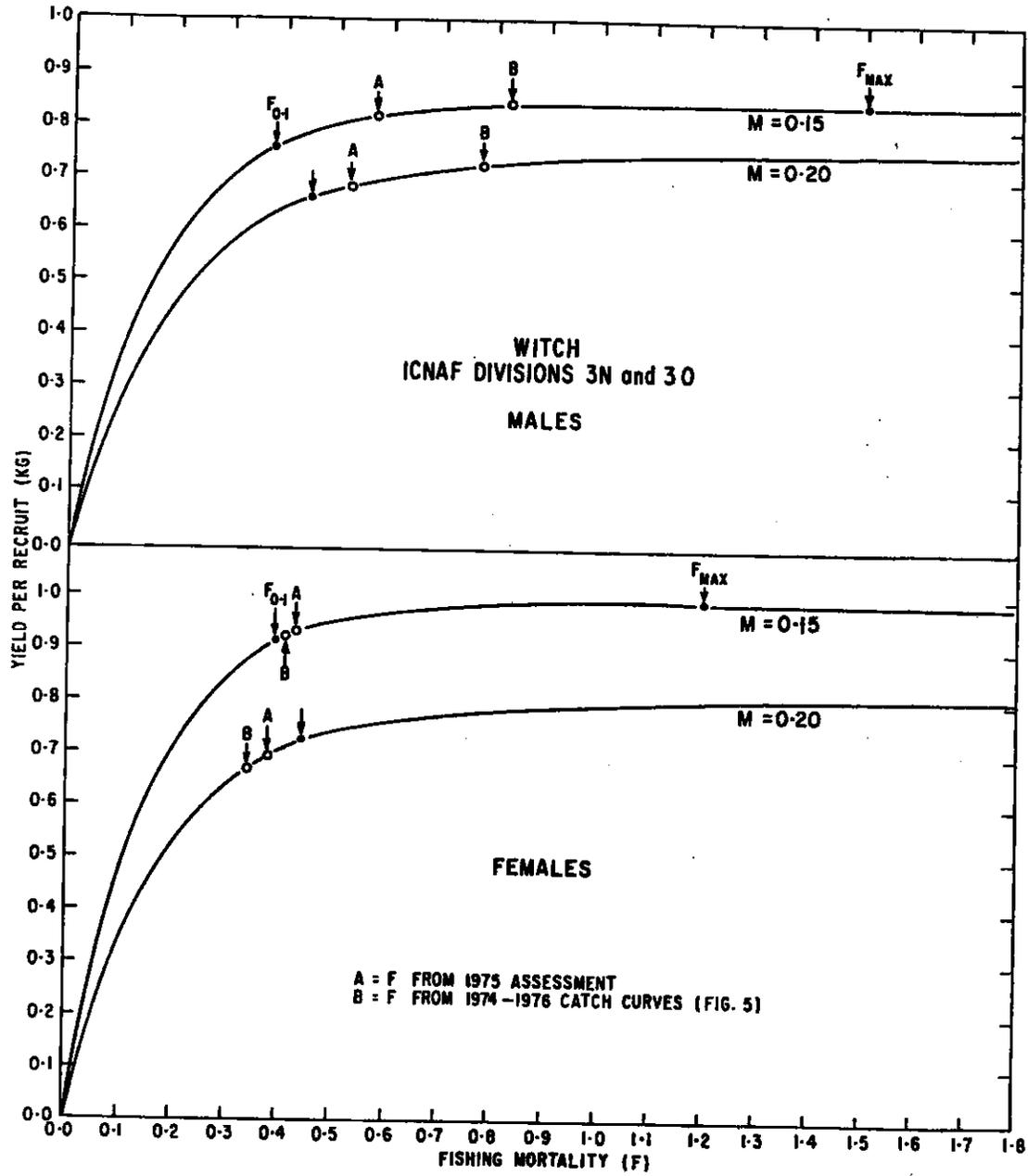
Fig. 6. Yield per recruit curves for male and female witch of ICNAF Divisions 3N and 3O computed 1974-76 combined commercial otter trawl data.