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The status of the witch flounder fishery in ICNAF Subdivision 3Ps

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Introduction

For management purposes, witch flounder in ICNAF Division 3Ps is considered to be a single stock. The main fishery in this area occurs on the southwest slope of St. Pierre Bank with small quantities being taken in Fortune Bay by inshore fishermen. This document presents the first analytical assessment of this stock.

Removals during the early 1950's were primarily by Danish seiners in Fortune Bay with annual catches of 500-700 metric tons. After 1955 catch per unit effort was too low to support a commercial fishery in Fortune Bay and since then practically all witch flounder caught in 3Ps were taken on St. Pierre Bank. The largest catches from this stock occurred during 1967-69 with catches totalling 4000-5000 metric tons. Canada and the USSR accounted for most of the catch (Table 1). Since then the fishery has been almost exclusively Canadian with catches on a general downward trend. Total allowable catches of 3000 metric tons (based on catch statistics) were agreed to at the 1973, 1974 and 1975 Annual Meetings of ICNAF and international quotas allocated for 1974, 1975 and 1976.

Materials and Methods

All samples were collected from Canadian commercial trawler landings for 1975. Males and females were sufficiently different in age composition and growth to warrant separation of the sexes (Fig. 1 and 2). Since the fishery is almost exclusively Canadian, it was assumed that the age and length composition of the catches were similar to that of the other countries for purposes of catch curve construction and mean selection length ( $l_c$ ) calculations. The  $l_c$  for males is 34.55 cm and females 34.77 cm.

Natural mortality was assumed to be 0.20 based on data collected prior to a commercial fishery (Bowering and Pitt 1974).

Von Bertalanffy growth curves were fitted to the age-length data and Beverton and Holt yield per recruit model was applied to males and females separately using the following parameters.

	<u>Males</u>	<u>Females</u>
$W_{\infty}$ - asymptotic weight	1.701 kg	2.970 kg
K - from von Bertalanffy equation	0.0973	0.0732
$t_0$ - from von Bertalanffy equation	0.41 yrs	0.25 yrs
$t_p$ - age at recruitment	7 yrs	7 yrs
$t_p^1$ - age at mean selection	9.2 yrs	9.8 yrs
$t_{\lambda}$ - age at last significant contribution to fishery	20 yrs	24 yrs

Yield per recruit curves were plotted for  $M = 0.20$  (Fig. 4) and were computed up to  $F = 2.5$ .

Results

Catch curves from the commercial age composition gave estimates of instantaneous total mortality ( $Z$ ) of 0.75 for the males and 0.42 for the females (Fig. 3). The yield per recruit curves (Fig. 4) indicate no definitive  $F_{max}$  up to  $F = 2.5$  so essentially the curves are flat-topped. Levels of  $F_{0.1}$  are indicated on the curve as well as the present fishing levels.

Discussion

The removals from this stock are apparently dependent upon effort directed towards other fisheries particularly cod and redfish. Since no information is available as to the discards by countries with no interest in this species the total nominal catches in Table 1 are therefore minimal.

The value of  $M = 0.20$  is probably maximal for this species considering its life span. In any case, average values of  $F$  for approximately the 1970-75 period indicated in Figure 4 are very close to  $F_{0.1}$  for the females and somewhat above  $F_{0.1}$  for the males. These should be representative of removals during these years averaging approximately 2000 metric tons.

References

- Bowering, W. R. and T. K. Pitt. 1974. An assessment of witch (*Glyptocephalus cynoglossus*) for ICNAF Divisions 2J-3KL. Intern. Comm. Northw. Atlant. Fish. Res. Doc. 74/48, Serial No. 3255.
- Pitt, T. K. 1973. Trends in the witch fishery in Subarea 3. Intern. Comm. Northw. Atlant. Fish. Res. Doc. 73/80, Serial No. 3032.

Table 1. Nominal catches of witch flounder, ICNAF Division 3Ps, 1963-75.

YEAR	CANADA	FRANCE	USSR	UK	PORTUGAL	TOTAL
1963	771	131	-	22	-	924
1964	963	-	-	48	-	1011
1965	555	-	-	15	-	570
1966	1344	-	79	21	-	1444
1967	3790	-	982	33	-	4805
1968	2561	106	1464	-	-	4131
1969	2309	95	1691	1	-	4096
1970	2591	111	-	-	-	2702
1971	2193	57	-	-	-	2250
1972	1517	69	8	-	-	1594
1973	2341	112	443	10	-	2906
1974	1699	2	-	-	40	1741
1975*	1181	-	-	-	13	-

\*All landings not yet received.

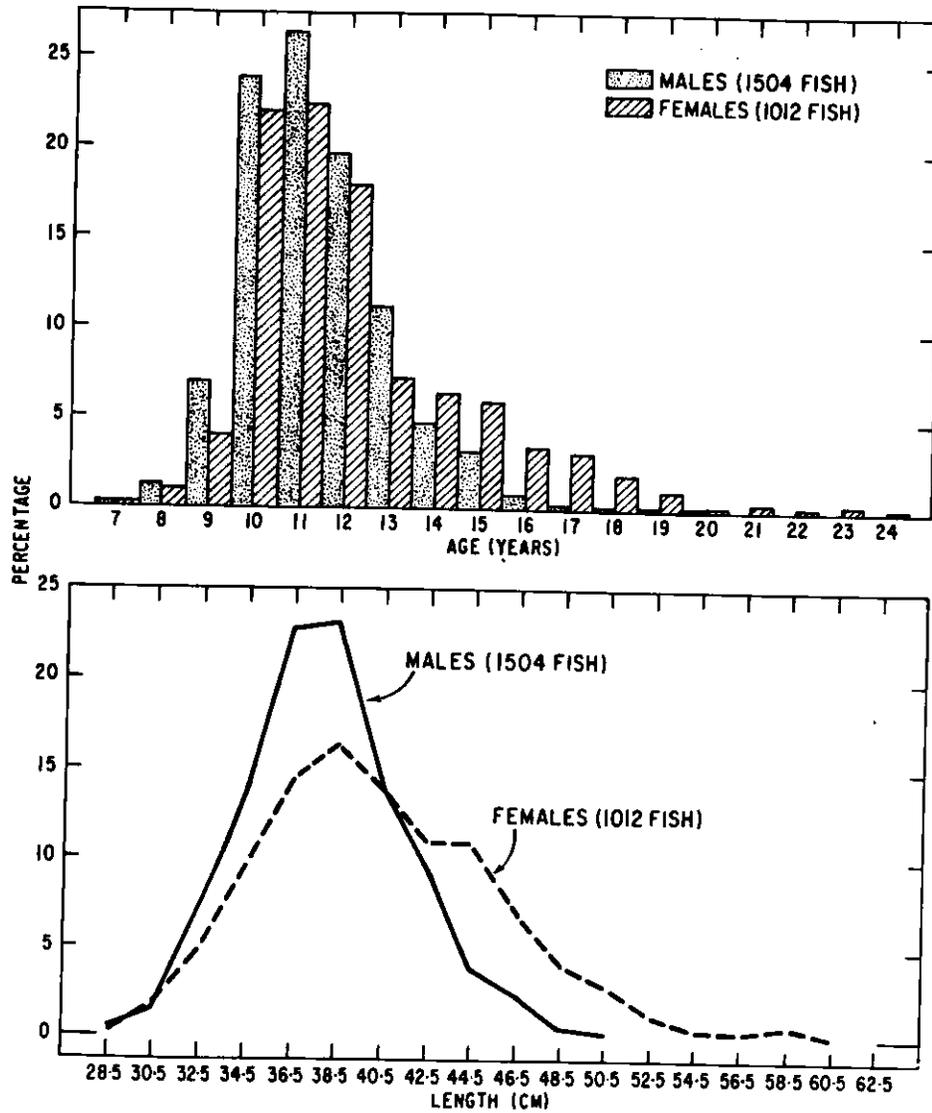


Fig. 1. Age and length composition of witch flounder, ICNAF Division 3Ps of Canadian commercial trawler catches, 1975.

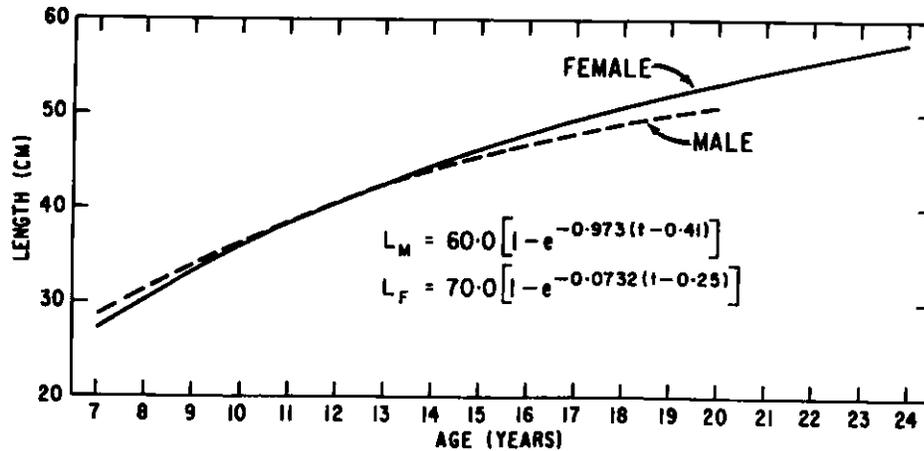


Fig. 2. Growth curves of male and female witch flounder of ICNAF Division 3Ps, 1975.

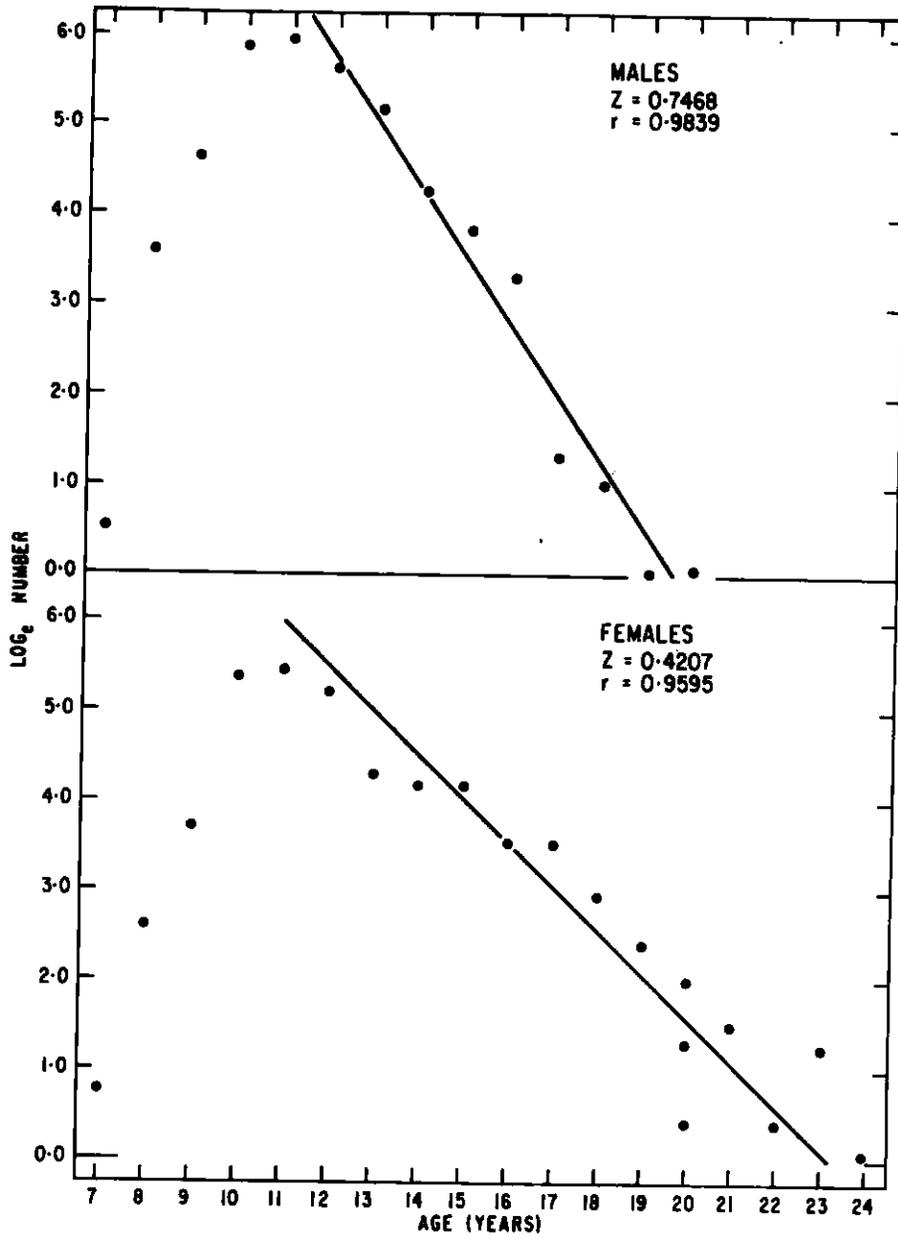


Fig. 3. Catch curves of male and female witch flounder, ICNAF Division 3Ps, from Canadian commercial trawler catches, 1975.

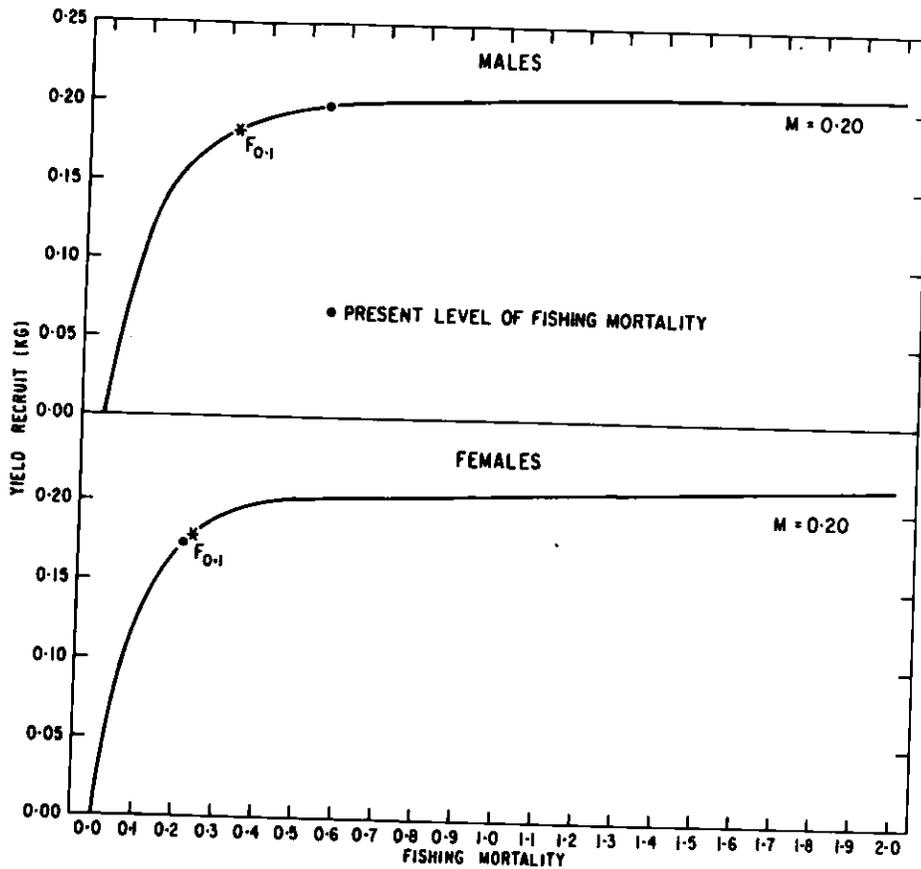


Fig. 4. Yield per recruit curves of male and females witch flounder, ICNAF Division 3Ps, 1975.

