

American plaice from ICNAF Subarea 2 and
Division 3K, a stock assessment update

by

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Introduction

This stock has been under quota regulation since 1974 with the following TAC and catches recorded:

	<u>1974</u>	<u>1975</u>	<u>1976</u>	<u>1977</u>	<u>1978</u>
TAC	10.0	8.0	8.0	8.0	6.0
Catch	5.6	5.6	6.7	7.3	

The highest recorded catch was nearly 13,000 tons in 1970, however the USSR catch (Table 1) indicated may be higher than the actual value since at that time plaice catches by the latter were included in the "unspecified flatfish" category and only later broken down by species. Catches dropped to 5,100 tons in 1973 and have increased each year since then. The increased 1977 catch for Canada is mainly because of the expanded otter trawler fishery which accounted for over 75% of the catch as compared to about 30% in 1976 and practically none in previous years since this has traditionally been, as far as Canada is concerned, almost exclusively a longlinger or gillnet fishery by small inshore boats. Foreign catches, which in the past have made up most of the catch, were all by otter trawler.

Assessment

The principal difficulty in assessing this stock is the fact that very little sampling data are available from the otter trawl component of this fishery since, as mentioned above, up to 1976 the Canadian fishery was almost exclusively by gillnets. Samples from this gear are not representative of the population since it selects

more larger and older fish than the otter trawl and furthermore the gillnet fishery is restricted to coastal areas.

A small amount of data were collected from otter trawlers in 1976 and a fairly substantial number of samples were collected in 1977. An attempt was made to calculate survival rates between 1976 and 1977 but unfortunately, probably because of a combination of small samples and the difficulty of estimating effort, this was unsuccessful.

The 1976 and 1977 numbers caught at age for inshore otter trawls were combined to produce catch curves (Fig. 1). These produced total mortality (Z) rates of 0.66 and 0.59 for females (ages 8-14) and females (ages 11-21) respectively. These values were higher than those calculated from the 1976 data, male = 0.56 and females = 0.46.

Beverton and Hold yield-per-recruit model was applied to males and females separately using the following parameters:

	<u>Males</u>	<u>Females</u>
M (natural mortality)	0.20 and 0.25	0.15 and 0.20
W_{∞} (asymptotic wt.)	1.86 kg	1.29 kg
K (from growth curve)	0.14	0.11
t_0 (from growth curve)	1.77	2.61
t_p (age of entry into exploited area)	4 yr	4 yr
t_p^1 (age of entry into exploited phase)	7.10 yr	9.50 yr
t_{λ} (last age of significant contribution)	14 yr	20 yr

Two levels of M were used here, however for plaice in Divisions 3LNØ M has been calculated to be 0.25 and 0.20 for males and females respectively (Pitt, 1973).

Discussion

The values of F calculated in this assessment, 0.41 for males and 0.39 for females, are a little above the $F_{0.1}$ levels of 0.38 and 0.30 respectively. Catches over the past 10 years have averaged about 7,000 tons but dropped to an average of 6,000 tons in the last 5 years.

Removal from this stock by the European fleet has been primarily as by-catch of the cod and redfish fishery and although most countries have very small quotas for plaice in these areas, there is still a fairly large foreign effort for cod.

The stock area occupies considerable territory, however the actual localities with suitable habitat for plaice is probably very limited, with plaice being distributed in localized "patches" throughout the area.

References

- Pitt, T. K. 1973. Assessment of American plaice stock on the Grand Bank, ICNAF Divisions 3L and 3N. Intern. Comm. Northw. Atlant. Fish. Bull. No. 10, p 63-77.

Table 1. Nominal Catches, American plaice, ICNAF Subarea 2 -
Division 3K, 1967-77.

Year	Canada	FRG	GDR	Poland	USSR	U.K.	Other	Total
1967	395		195	1,134	1,701	162		3,591
1968	1,023		38	1,889	2,911	90		5,951
1969	1,689		214	867	4,129		3	6,902
1970	3,751		104	378	8,610			12,686
1971	2,486		19	233	2,597	2		5,348
1972	1,197	4	169	849	6,760	42		9,123
1973	1,384	70	138	225	3,011	76		5,140
1974	568	223	24	91	4,643	61		5,610
1975	859		29	95	4,449	11	302	5,662
1976	2,447	29	23	118	3,373		87	6,707
1977*	6,602	2	41	27	708			7,380

*Provisional

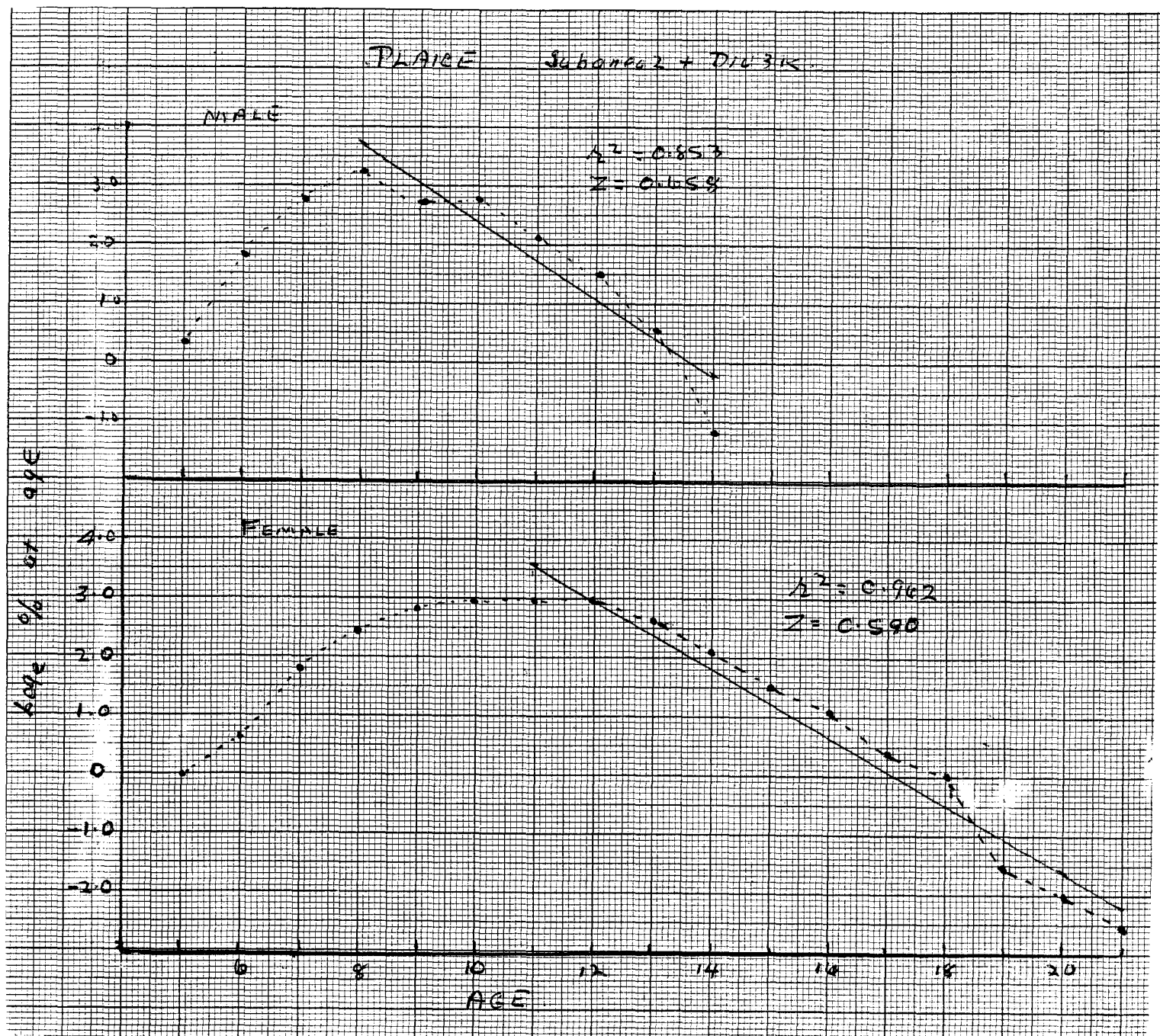


Fig. 1. Catch curves of plaice from Subarea 2 and Division 3K using estimates of total numbers caught by all gears 1976 and 1977.

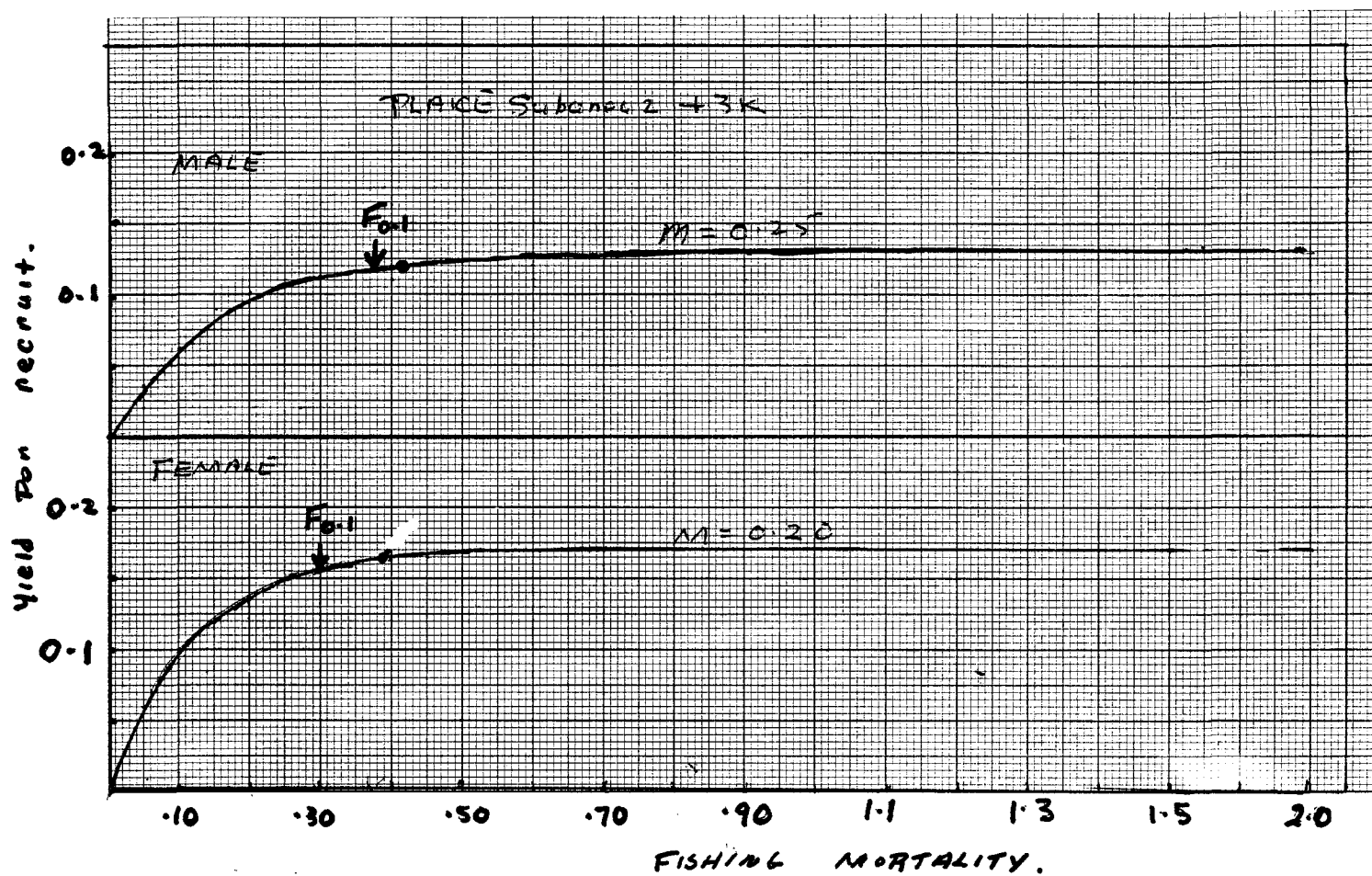


Fig. 2. Yield-per-recruit curves for plaice in Subarea 2 and Division 3K. (X) indicates level of F from the catch curves in Fig. 1.