

An assessment update of American plaice -
ICNAF Subarea 2 & Division 3K

by

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INTRODUCTION

This stock has been regulated by quota since 1974. The catches and TACs in recent years are listed below.

	<u>1974</u>	<u>1975</u>	<u>1976</u>	<u>1977</u>	<u>1978</u>	<u>1979</u>
TAC	10.0	8.0	8.0	8.0	6.0	6
CATCH	5.6	5.7	6.7	7.5	3.5	

The highest recorded catch was nearly 13,000 tons in 1970, however, there was some question of the Soviet breakdown of flatfish catches at this time. Up to 1976 the Canadian catch was almost entirely by the inshore fleet using gill nets, however since then (1977 and 1978) there has been some Canadian directed effort on this stock (Table 4).

ASSESSMENT

The problem with doing a proper analytical assessment of this stock is the fact that up to 1977 we were only able to obtain samples from the gill net segment of the landings i.e. the Canadian inshore fishery which usually accounted for less than 50% of the total removals.

Previous assessments were based on catch curves which reflect mortalities generated by removals over a period of years. For the 1978 assessment it

appeared that fishing mortalities slightly above the $F_{0.1}$ level (0.35 for males and 0.30 for females) were generated by catches averaging a little over 6,000 tons (6600 tons 1972-77).

For this assessment survival rates were estimated using catch per unit effort at age from estimates of numbers caught from Canadian Commercial Sampling of otter trawlers, (Table 4). These indicate low total mortality rates i.e. 0.36 for males and 0.31 for females with F_s equal to 0.11 for both males and females.

($M = 0.25$ and 0.20)

Survival rates calculated from research vessel data (Table 6) using the same starting age groups as in Table 4 indicate much higher F_s than those indicated in the commercial data.

CONCLUSION

It is still not possible to do a comprehensive analytical assessment since available data from the total stock are not particularly good. The 1978 advice for this stock was aimed at fishing at a level to maintain fishing mortality at $F_{0.1}$ which from the available data would be achieved with a TAC at 6,000 t. Although the present information still leaves a great deal of uncertainty concerning the condition of this stock, it would appear that a continuation of the present level of removals at 6,000 tons would probably maintain the desired fishing mortality level.

Table 1. Nominal catches, American plaice, ICNAF Subarea
2 - Division 3K, 1967-78.

Year	Canada	FRG	GDR	Poland	USSR	U.K.	Other	Total
1967	395		195	1,134	1,701	162	4	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	8,160		293	12,686
1971	2,486		19	233	2,597	2	11	5,348
1972	1,197	4	169	849	6,760	42	102	9,123
1973	1,384	70	138	225	3,011	76	236	5,140
1974	568	223	24	91	4,643	61		5,610
1975	859		29	95	4,449	11	219	5,662
1976	2,477	29	23	118	3,373		87	6,107
1977	6,616	10	89	27	702		63	7,507
1978*	3,185	55	-	138	117			3,495

*Provisional

Table 2. No. caught ('000) by Canadian fishery 1977, Plaice Sa2+3K

(a) Otter Trawl		(b) Gill Net						
Age	Male			Total			Total	
	February	March	April		July	September		
5			24	24				
6	2	29	39	70	8		8	
7	5	114	84	203	22	10	32	
8	18	271	120	409	225	94	319	
9	21	225	149	395	245	204	449	
10	20	170	78	268	144	83	227	
11	9	52	34	95	36	10	46	
12	3	16	13	32	16		16	
13	1	3	3	7	4		4	
14					2		2	
No. meas.	317	459	322		724	307		
		Female						
6		3	13	16	2		2	
7	2	29	42	73	8	8	16	
8	3	62	123	188	38	21	59	
9	18	235	201	454	99	150	249	
10	34	366	337	737	146	285	431	
11	59	487	262	808	245	154	399	
12	66	392	413	871	223	51	274	
13	39	252	256	547	190	16	206	
14	37	209	191	437	107	8	115	
15	26	157	86	269	105		105	
16	16	95	86	197	69		69	
17	7	49	37	93	22		22	
18	4	36	18	58	12		12	
19	1	7	3	11	4		4	
20	1	7		8	-		-	
21		3		3	2		2	
NK		3		3				
No. meas.	1417	1125	1168		1299	90		
Wt. landed	373	2358	1960 ⁽¹⁾	4691	1282 ⁽²⁾	1310 ⁽³⁾	2592	7283

(1) April - May
 (2) April - July
 (3) August - October

Table 3. No. caught ('000) Canadian fishery 1978, Plaice Sa2+3K

(a) Otter Trawl		<u>Male</u>		(b) Gill Net	
<u>Age</u>	<u>January</u>	<u>February</u>	<u>Total</u>	<u>July</u>	
6	1	2	3	3	
7	1	8	9	11	
8	6	29	35	-	
9	26	124	150	103	
10	37	140	177	190	
11	29	87	116	160	
12	11	24	35	103	
13	2	5	7	24	
14	1	2	3	5	
No. measured	203	227			
		<u>Female</u>			
6				3	
7	1	6	7	-	
8	4	16	20	11	
9	11	50	61	16	
10	41	145	186	152	
11	77	259	336	368	
12	81	209	290	536	
13	62	183	245	550	
14	41	121	162	233	
15	23	64	87	133	
16	24	77	101	57	
17	7	21	28	27	
18	10	24	34	14	
19	2	6	8	-	
20				3	
21+				3	
No. measured	651	648			
Wt. landed	354	1089(1)	1443	1555(2)	
(1) February-June (Otter Trawl)					
(2) May-September (Gill Net)					

Table 4. Calculation of survival rates, total mortality (Z) and fishing mortality from catch per 100 hours at age for Plaice caught by otter trawlers 1977-78.

AGE:	<u>MALE</u>				<u>FEMALE</u>			
	<u>Otter Trawler Catches</u>							
	<u>1977</u> NO. CAUGHT ('000)	<u>No/100</u> HOURS	<u>1978</u> NO. CAUGHT ('000)	<u>No/100</u> HOURS	<u>1977</u> NO. CAUGHT ('000)	<u>NO/100</u> HOURS	<u>1978</u> NO. CAUGHT ('000)	<u>No/100</u> HOURS
5	25	213	4	76				
6	73	623	12	228	17	145		
7	213	1820	47	895	77	658	9	171
8	429	3666	202	3847	197	1683	27	514
9	414	3538	238	4333	477	4076	82	1561
10	386	3299	156	2771	774	6616	250	4761
11	100	854	47	800	848	7247	452	9002
12	34	290	9	171	915	8220	390	7100
13	7	60	4	76	574	5101	319	6010
14					458	4216	208	3820
15					282	2410	117	2028
16					207	1769	136	2499
17					98	838	38	701
18					61	521	45	841
19					12	103	11	198
20					8	68		
21					3	26		

1977

O.T. Catch 4715 Tons
Dir CPUE 0.402 Tons/hr.
Effort 11728 hours

MALE

Σ 9-13/ Σ 8-12
S = 0.696
Z = 0.362

1978

2100 Tons
0.400 Tons/hr.
5250 hours

FEMALE

Σ 12-19/ Σ 11-18
S = 0.733
Z = 0.310

Table 5. Average number and weight (kg) per set for strata surveyed 1977 and 1978 101-400 m.

Strata No.	Area Sq. Mi.	Depth M	Ave. No./Set	1977 (Fall)		1978 (Fall)	
				Ave. Wt./Set	Ave. No./Set	Ave. Wt./Set	Ave. No./Set
201	1427	101-200	74	52.7	119	56.5	
205	1823	"	177	75.3	43	13.7	
206	2583	"	534	253.3	235	129.4	
207	2246	"	156	72.6	75	21.9	
202	440	201-300	71	45.9	78	14.5	
209	1608	"	107	54.1	65	20.5	
210	774	"	54	12.8	144	40.9	
213	330	"	151	61.8	126	48.4	
214	1171	"	42	23.6	50	25.6	
215	1270	"	54	27.8	189	59.0	
228	1428	"	102	21.9	-	-	
234	508	"	70	23.6	34	9.7	
203	480	301-400	16	7.4	-	-	
208	448	"	31	16.9	55	15.3	
222	441	"	8	3.2	12	2.7	
229	567	"	23	7.0	3.0	0.5	
Total Area		17,544					

Table 6. Average No./set for research vessel catches 1977 and 1978 (Strata 201, 202, 205, 206, 209, 210, 213, 214, 215 and 234).

	<u>MALE</u>		<u>FEMALE</u>	
	<u>1977</u>	<u>1978</u>	<u>1977</u>	<u>1978</u>
5	5.7	3.4	3.1	2.1
6	11.9	8.7	7.5	7.4
7	20.4	14.3	20.1	9.9
8	35.2	8.2	24.9	12.4
9	21.2	7.4	13.1	8.4
10	7.1	3.4	8.5	7.2
11	1.2	0.5	8.4	6.2
12	0.4	0.3	6.0	5.3
13	0.1	0.02	4.1	4.8
14			2.3	2.0
15			1.0	1.5
16				0.7
	<u>Σ 9-13 S=0.138</u>		<u>Σ 9-16 S=0.534</u>	
	<u>Σ 8-12 Z=1.982</u>		<u>Σ 8-15 Z=0.628</u>	
			<u>Σ 12-16 S=0.651</u>	
			<u>Σ 11-15 Z=0.429</u>	

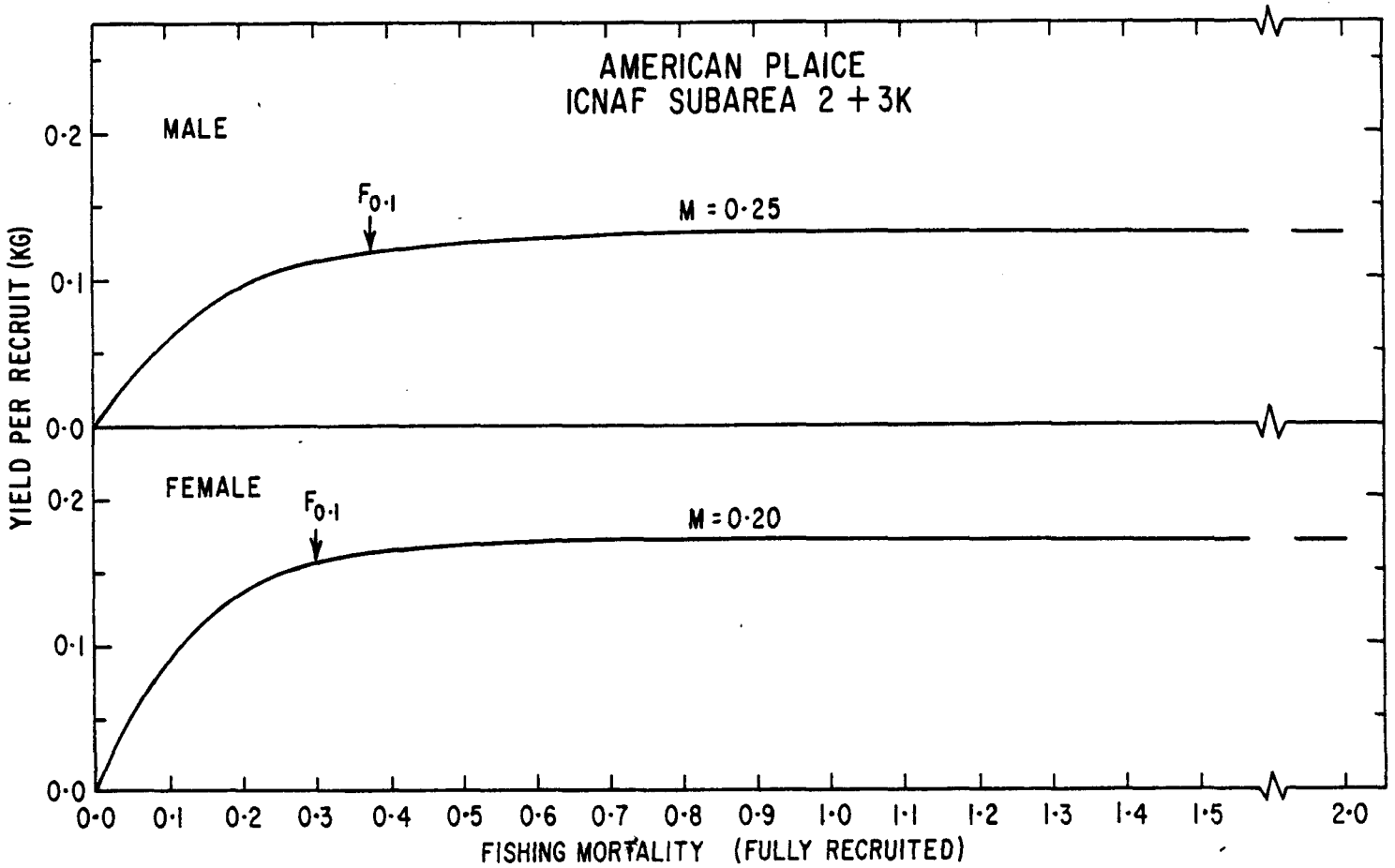


Fig. 1. Yield per recruit of American plaice in S a2+3K.