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An Assessment on American Plaice in Division 3M

by

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Introduction

The stock mainly occurs on Flemish Cap at depths shallower than 600m. Actually, for member countries, the catches come mainly as by catch from trawl fisheries directed to other species in this Division.

Since 1974, when this stock started to be regulated, catches ranged from 600 t in 1981 to 5 600 tons in 1987. After that catches presented a declining trend to 275 t by 1993, caused in part by a reduction in directed effort by the Spanish fleet, which took place in 1992. Since this, catches newly increase to the level of the beginning of the 90's. Catch for 1995 was estimated to be 1 300 t. Estimated catch for non members countries exceeded by more than three times the catch of NAFO members. By catch in the shrimp fishery were not included in the catch, but are estimated to be low (SCR Doc. 96/64).

From 1979 to 1993 a TAC of 2000 t has been in placed for this stock. A reduction to 1000 t was decided for 1994 and 1995, a moratoria was agreed for 1996 (Fig. 1).

Recent TAC and Catch ('000) are as follows:

	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996
TAC	2	2	2	2	2	2	2	2	1	1	0
Catch	3.8	5.6	2.8	3.5	0.8	1.6	0.8	0.3	0.7	1.3	

i Provisional

Input Data

Commercial fishery data

Commercial data were insufficient to derive length composition. As in 1995, length and age composition of the catches were derived from the survey which took place in July 1995. This was consider to be adequate taking into account that more than 77 % of the total catch was estimated to come from non member countries, which are not regulated by NAFO enforcement measures. This catches were though to have a similar length composition to the survey. Results are presented in table 1.

Table 1.- Catch at age matrix for the period 1988-95

Age	1988	1989	1990	1991	1992	1993	1994	1995
3	34	188	11	14	15	27	5	21
4	204	150	184	102	30	30	222	166
5	642	507	57	545	86	70	94	445
6	1161	998	95	288	282	86	77	368
7	790	1041	169	412	73	79	82	307
8	1003	499	229	363	148	39	289	217
9	289	446	156	222	133	23	28	183
10	93	213	69	63	62	19	55	22
11	24	169	10	7	36	2	19	36
12	52	40	2	3	19		19	52
13	55	20	2	0	22		22	41
14	14	8	1	0	0		46	24
15	27	0	0	0	0		46	32

Mean weight at age in the catch (table 2) do not indicate any trend.

Table 2.- Mean weight at age in the catch for the period 1988-95

Age	1988	1989	1990	1991	1992	1993	1994 ₂	1995 ₂
3	0.181	0.247	0.237	0.117	0.201	0.145	1.144	0.159
4	0.264	0.371	0.358	0.304	0.292	0.271	0.282	0.275
5	0.293	0.449	0.488	0.472	0.456	0.377	0.436	0.435
6	0.445	0.681	0.579	0.619	0.649	0.611	0.510	0.577
7	0.619	0.867	0.845	0.873	0.754	0.915	0.594	0.632
8	0.864	0.960	0.992	1.064	0.978	1.303	0.752	0.775
9	1.001	1.156	1.101	1.282	1.183	1.265	0.895	1.023
10	1.198	0.975	1.125	1.380	1.271	1.468	0.868	1.150
11	1.233	1.588	2.006	1.477	1.491	1.731	0.976	1.354
12	1.504	1.677 ₁	1.887	1.671	1.645		0.976	1.386
13	1.806	1.843 ₁	1.726		1.997		1.215	1.526
14	1.674	1.716 ₁	1.758				1.500	1.626
15								1.526
16								1.709

₁ estimated as a mean from the remaining years

₂ Derived from the EU survey

Research survey data

The series of research surveys conducted by the EU since 1988 was continued in July 1995. The Russian survey series started in 1983 was interrupted in 1994. A continuous decreasing trend in both the indices of abundance and biomass was observed since the beginning of the EU series. Russian series, although presenting a higher variability, also show a decreasing trend starting in 1986 (table 3, fig. 2).

Table 3.- Trend in biomass and abundance showed by the surveys.

Year	EU-Num	EU-Biom.	R.-Num.	R.-Biom.
1983				8900
1984				7500
1985				7800
1986				20200
1987				9300
1988	21219	11868	10000	6500
1989	20500	10533	8300	5000
1990	16631	9101	2600	1200
1991	13932	7565	12700	14400
1992	10363	6492	1900	1000
1993	9268	5949	3600	2700
1994	8538	6173		
1995	7089	5087		

During the survey series the age reader was changed three times, an age compositions of the survey may reflect different criteria (table 4), this came out when try to a particular year class along the series. Although this may produced some variability, the 1996 and 1990 year-classes appear to be the strongest of the series. Since 1991 a series of very poor year-classes are indicated by the cruise.

Table 4.- Age composition of A. plaice in the survey.

Age	1988	1989	1990	1991	1992	1993	1994	1995
2	2284	454	359	309	736	9	34	25
3	625	6847	775	911	679	1365	40	79
4	3040	1500	7083	1877	910	969	1789	611
5	1975	3238	897	4461	1471	643	782	1639
6	3020	3006	2475	1836	3423	320	651	1356
7	4154	2868	1717	2009	913	310	703	1131
8	4258	1691	1657	1566	1090	339	2487	798
9	1492	587	1030	675	624	592	243	674
10	207	261	485	232	289	286	480	82
11	109	34	90	8	138	198	166	131
12	61	14	15	48	74	229	164	191
13			31		16	280	195	151
14			17			865	398	89
15						28	397	117
16						35	9	15

The spawning stock biomass (50% age 5 + age 6+) as estimated from the EU surveys increase in 1993 to a value close to 1991, but decrease again in 1995 (table 5), this decreasing trend is expected to be continued as no strong year classes will recruit to the SSB in the near future.

Table 5.- Trends in the SSB index showed by the survey.

Year	1988	1989	1990	1991	1992	1993	1994	1995
SSB	8.5	5.8	5.3	5.7	3.6*	5.0	5.0	4.3

* Estimating using mean weight at age in the catch

Estimation of parameters

Taking into account the deficiencies in the data base, only a crude approximation of the trend in fishing mortality could be obtain, by comparing the catch and survey biomass ratio for ages fully recruited to the fishery (8-11).

For 1995 the F index was 0.27, which was an increase of 136% compared to the 1994 level (table 6; fig. 3).

Table 6.- Trend in F index for the period 1988-90.

Year	Catch	Survey	C/B
1988	1298	6066	0.21
1989	1470	2573	0.57
1990	497	3262	0.15
1991	768	2481	0.31
1992	435	2141	0.20
1993	111	1075	0.10
1994	309	2666	0.12
1995	429	1580	0.27

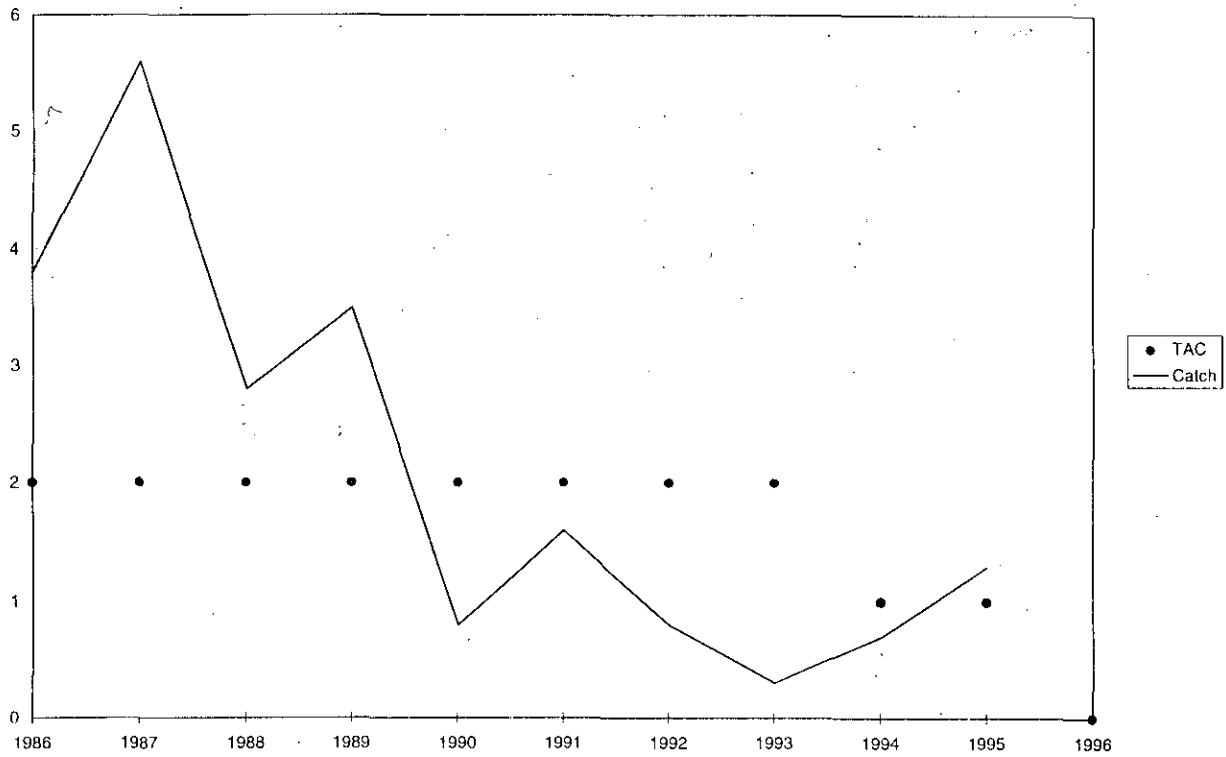


Fig. 1.- Evolution of catches and TAC's.

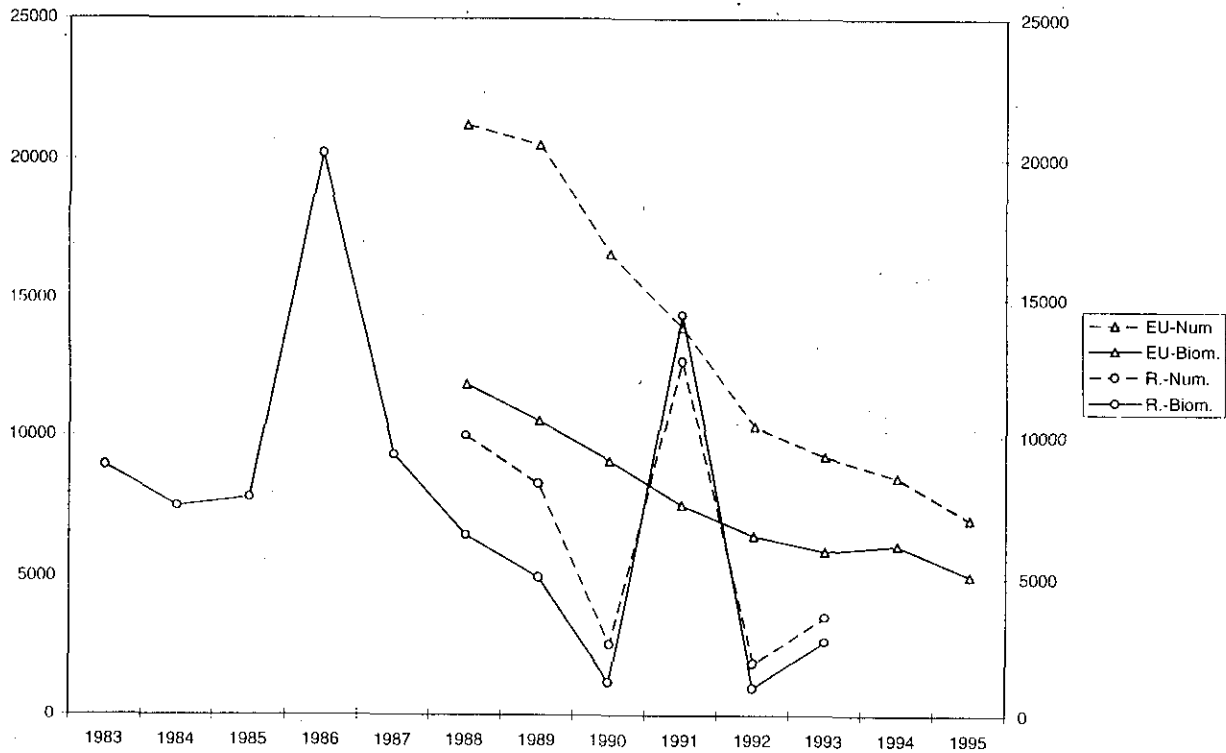


Fig. 2.- Abundance and Biomass trends in the surveys.

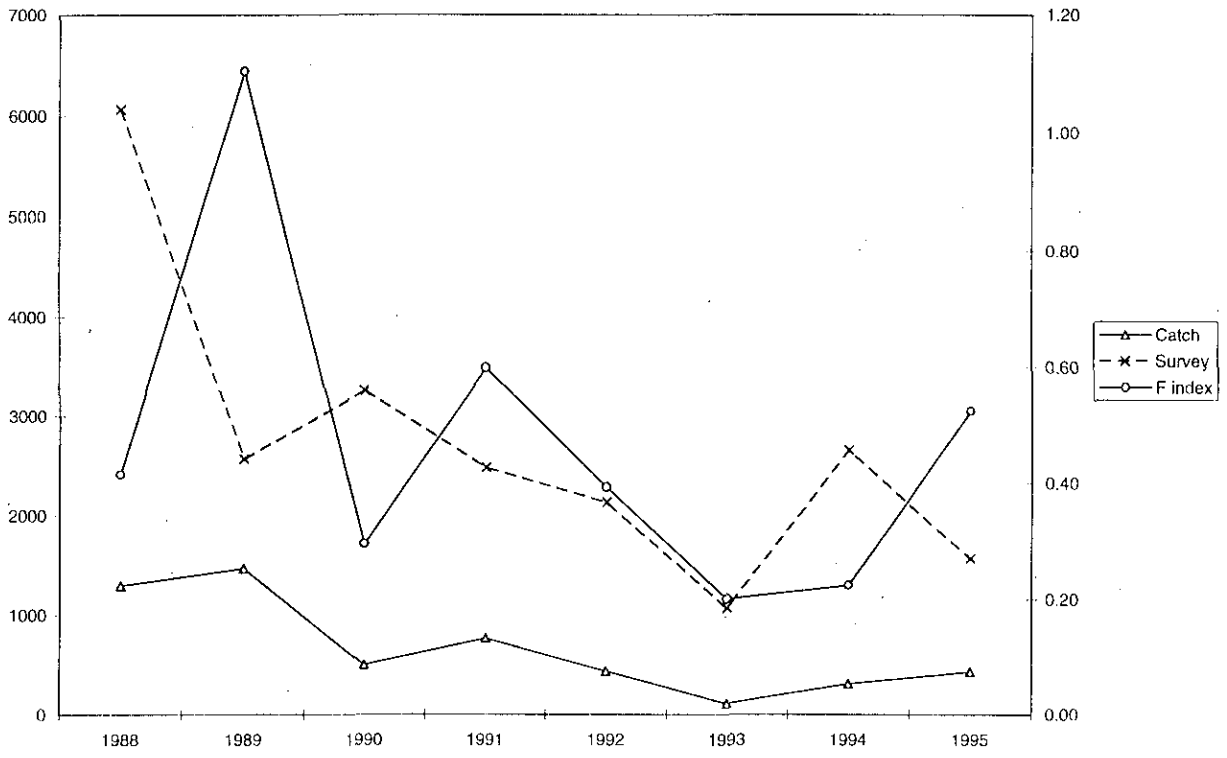


Fig. 3.- Catch, EU surveyed biomass and F index evolution.