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Flemish Cap redfish

by

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INTRODUCTION

Because of gaps in the time series of catch/effort data prior to 1972, coupled with a change in fleet composition at about the same time, recent assessments have incorporated data only from 1972 onwards. A lack of commercial catch at age data eliminates the possibility of any analytical assessment. Thus no more has been done with this stock in recent years beyond a general monitoring of trends in catch rates and research vessel results.

METHODS AND RESULTS

The breakdown of catches by country since 1971 (Table 1) indicates that the USSR has consistently taken the greatest proportion. Since 1979, the TAC's have not been achieved (Fig. 1). It can be seen (Table 2) that this fishery is prosecuted throughout the year.

Catch/effort data from 1972-1982 were incorporated in the multiplicative model (Gavaris 1980) (Tables 3,4) to determine the standardized (to 1972) effort (Fig. 2) and catch rate (Fig. 3). Effort has been the lowest of the time series since 1979. Although still quite high, the catch rate dropped slightly between 1981 and 1982.

Regressions of CPUE on effort (Fig. 4 and 5) indicate significance only when the 1972 and 1974 points are omitted.

The mean numbers caught per standard tow during Canadian research cruises to Div. 3M (Table 5), fluctuated in the earlier years, then showed an increase from 1981 to 1983 as a result of the relatively strong year-classes of the late 1970's-early 1980's (Fig. 6, 7). The mean number caught per tow dropped considerably in 1984 and this is largely due to a significant decrease in the numbers of these year-classes that were caught (Fig. 6,7). The reason for the decline in catch of these year-classes is unknown.

The only commercial frequencies available (Fig. 8) suggest that again in 1983, the fishery was concentrated on the year-classes of the early 1970's.

DISCUSSION

It was noted in last year's assessment (Atkinson MS 1983) that the fishery was concentrated on the early 1970's year-classes and that survey results from early 1983 indicated that these year-classes are being depleted. This situation is also seen in the 1983 fishery and the 1984 survey results. In addition, the catch rate dropped between 1981 and 1982, also perhaps indicating depletion of these year-classes. This observation is not unexpected but previously it was felt that the late 1970's - early 1980's year-classes would support the fishery beginning in the late 1980's. The apparent disappearance of these year-classes is therefore alarming.

If the apparent decrease in abundance of these pre-recruits is real, then recruitment to the fishery in the foreseeable future will be poor. Because of this, the situation should be monitored closely and it may be advisable to impose a precautionary TAC well below the present level of 20,000 t.

REFERENCES

- Atkinson, D. B. MS 1983. Redfish in NAFO Division 3M. NAFO SCR Doc. 83/VI/33. Serial No. N686.
- Gavaris, S. 1980. Use of a multiplicative model to estimate catch rate and effort from commercial data. Can. J. Fish. Aquat. Sci. 37: 2272-2275.

Table 1. Div. 3M redfish catches by country and year.

Country	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983*
Canada (MQ)	1	-	-	-	4,040	1,402	486	443	218	12	-	1
Canada (N)	2	2	8	659	4,328	3,392	3,861	4,686	60	517	2	-
Fr. (M)	-	2	3	-	-	546	242	67	15	7	-	-
Fr. (SP.)	-	-	-	-	-	25	-	-	-	-	-	-
FRG	306	773	35	4	44	10	300	-	73	-	41	-
GDR	-	-	-	-	-	-	-	-	1,290	15	-	40
Japan	177	-	-	-	-	138	321	636	976	386	392	369
Poland	960	427	17	1	30	11	83	13	292	-	-	-
Portugal	1,773	881	790	2,464	518	854	455	666	985	659	1,408	925
Romania	33	-	-	-	-	-	24	4	-	-	-	-
Spain	20	-	-	-	-	52	31	13	29	488	31	-
UK	316	241	3,679	552	-	376	20	-	-	-	3	-
USSR	38,358	19,964	30,139	12,393	8,038	9,507	9,251	10,441	10,430	10,434	10,916	8,773
Ireland	-	-	-	-	-	2,503	767	-	-	-	-	-
Norway	-	-	-	2	-	-	-	-	-	-	-	-
Den-G-F	-	62	-	-	-	-	-	-	-	-	-	-
Cuba	-	-	-	-	-	1,451	863	1,527	1,549	1,373	1,853	2,024
Bul.	-	-	-	-	-	-	58	1,578	50	-	-	-
KOR-s	-	-	-	-	-	-	-	-	-	-	38	-
TOTAL	41,946	22,352	34,671	16,075	16,998	20,267	16,762	20,074	15,957	13,891	14,684	12,132

*Provisional

Table 2. Div. 3M redfish catches by month and year.

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.	NK	TOTAL
1972	34	137	7,435	4,050	90	1,505	9,482	7,719	6,422	2,504	769	26	1,773	41,946
1973	53	1,285	13,264	4,468	1	961	200	101	369	1,280	308	-	62	22,352
1974	35	1,486	3,388	4,500	6,687	7,323	2,151	2,092	1,971	1,920	1,976	1,142	-	34,671
1975	983	920	917	2,042	1,012	1,191	1,039	1,873	1,564	1,819	1,615	1,100	-	16,075
1976	2	2	180	2,950	1,580	1,130	686	7,415	2,473	277	283	20	-	16,998
1977	417	532	2,786	1,847	1,821	3,649	4,284	1,416	590	243	81	98	2,503	20,267
1978	394	354	963	1,156	1,026	4,017	1,004	1,650	1,301	2,996	1,067	834	-	16,762
1979	790	1,560	896	4,237	5,147	2,394	1,393	56	111	1,486	1,369	635	-	20,074
1980	1,212	1,341	4,751	2,852	1,377	735	-	1,083	1,126	471	293	726	-	15,967
1981	198	849	2,671	5,120	1,615	711	698	952	847	7	149	74	-	13,891
1982	987	243	2,065	2,615	2,223	1,117	1,261	2,188	436	59	24	58	1,408	14,684

Table 3. Results of multiplicative model for Div. 3M redfish.

MULTIPLE R.....0.752
MULTIPLE R SQUARED.....0.565

ANALYSIS OF VARIANCE

SOURCE OF VARIATION	DF	SUMS OF SQUARES	MEAN SQUARES	F-VALUE
INTERCEPT	1	5.966E1	5.966E1	
REGRESSION	20	2.366E1	1.183E0	10.861
TYPE 1	4	1.506E1	3.765E0	34.557
TYPE 2	6	3.581E0	5.968E-1	5.478
TYPE 3	10	4.650E0	4.650E-1	4.269
RESIDUALS	167	1.819E1	1.089E-1	
TOTAL	188	1.015E2		

Table 4. Predicted relative catch rate and effort for Div. 3M redfish.

YEAR	TOTAL CATCH	PROP.	RELATIVE POWER MEAN	S.E.	EFFORT
1972	41946	0.932	1.000	0.000	41946
1973	22352	0.893	0.934	0.142	23940
1974	34671	0.844	0.959	0.107	36156
1975	16075	0.738	0.756	0.086	21266
1976	16998	0.705	0.683	0.089	24902
1977	20267	0.562	0.911	0.119	22256
1978	16762	0.655	0.564	0.073	29727
1979	20074	0.670	0.725	0.088	27683
1980	15967	0.658	0.836	0.110	19090
1981	13891	0.756	0.953	0.139	14574
1982	14684	0.714	0.889	0.121	16510

AVERAGE C.V. FOR THE MEAN:0.119

Table 5. Mean numbers and weights per tow of redfish caught during Canadian research cruises to Div. 3M, 1978-1984.

Year	# Sets	#/Tow	WT/Tow
1978	134	723.71	343.30
1979	95	382.17	175.98
1980	130	861.43	334.56
1981	142	683.16	279.26
1982*	108	1,106.07	160.44
1983	142	1,207.75	218.92
1984	129	486.81	183.53

*The following strata were missed due to bad weather:

Stratum	Depth (fath)
515	201-300
516	301-400
517	"
518	"
519	"

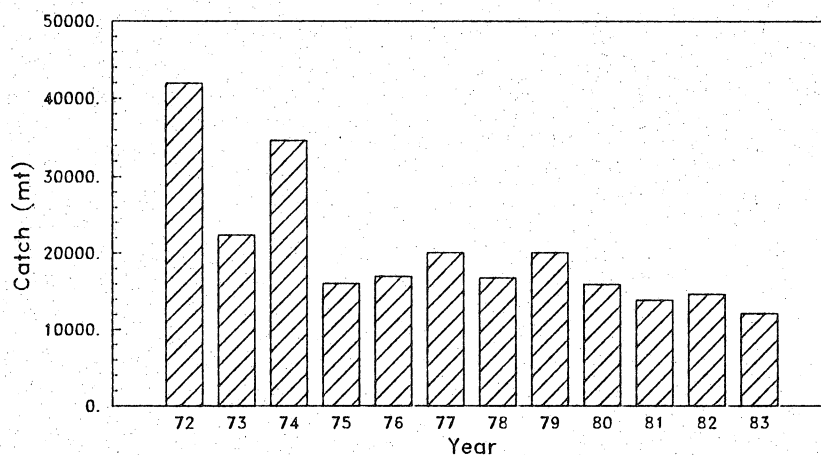


Fig.1: Nominal catches of redfish from Div. 3M, 1972-1983. (1983 Provisional)

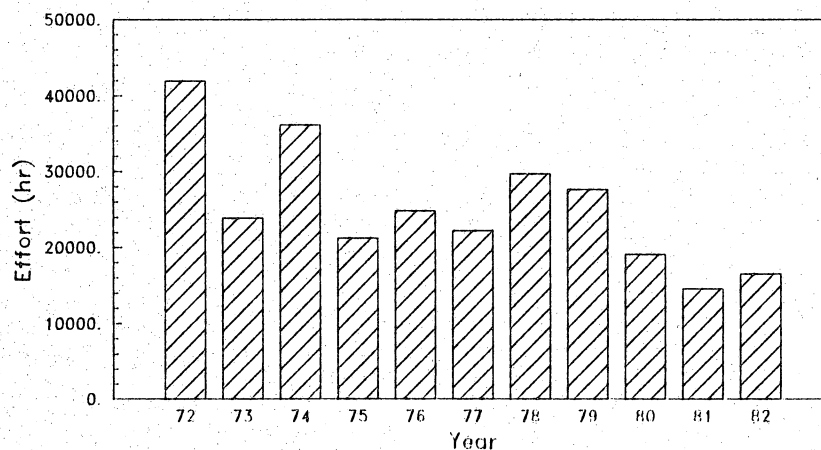


Fig.2: Standardized directed effort for redfish, Div. 3M 1972-1982.



Fig. 3. Standardized catch rate for redfish in Div. 3M.

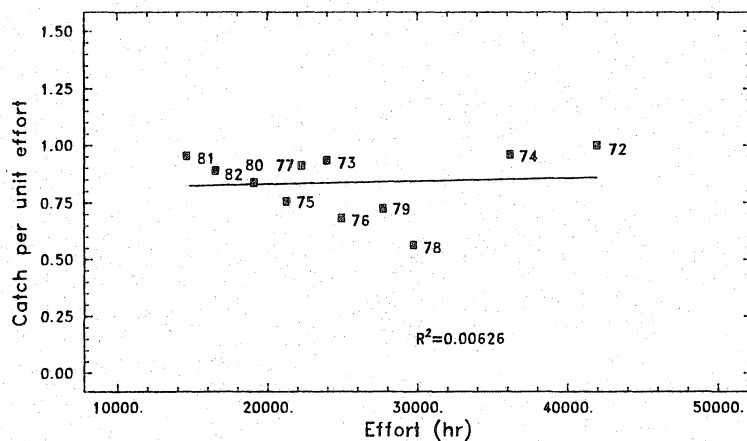


Fig.4: Regression of C.P.U.E. on effort for Div. 3M redfish.

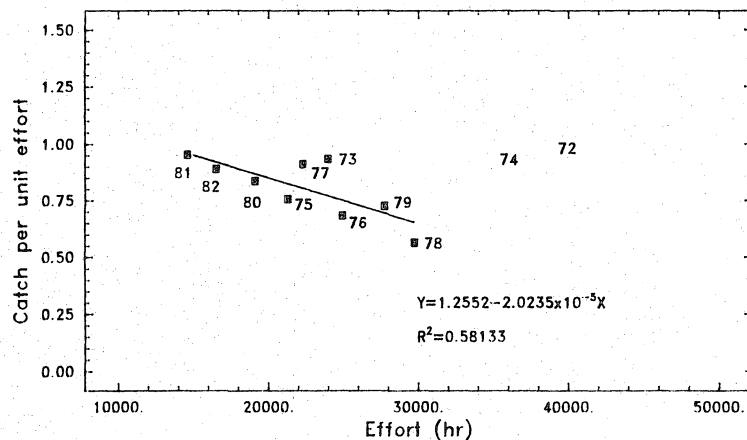


Fig.5: Regression of C.P.U.E. on effort without 1972 and 1974 for Div. 3M redfish.

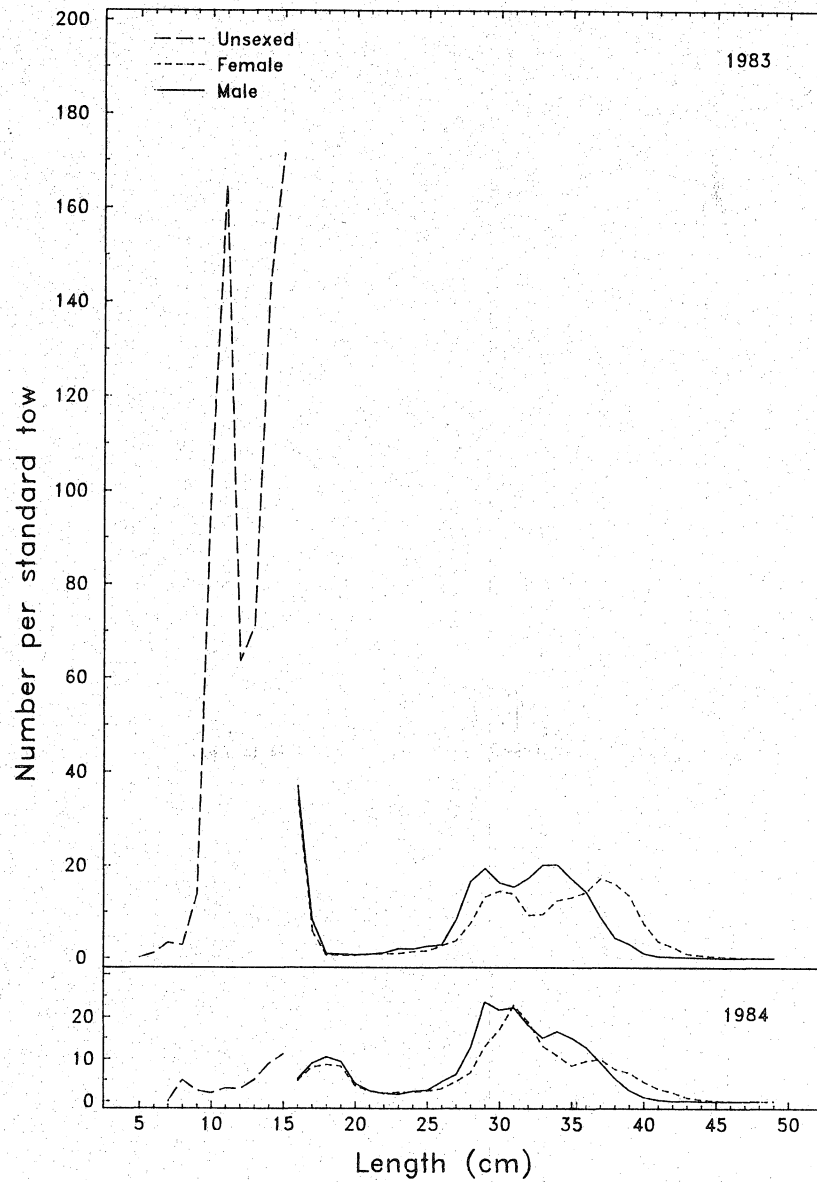


Fig.6: Number of redfish caught at length per standard tow during Canadian research cruises to Div. 3M in Feb. 1983 and 1984.

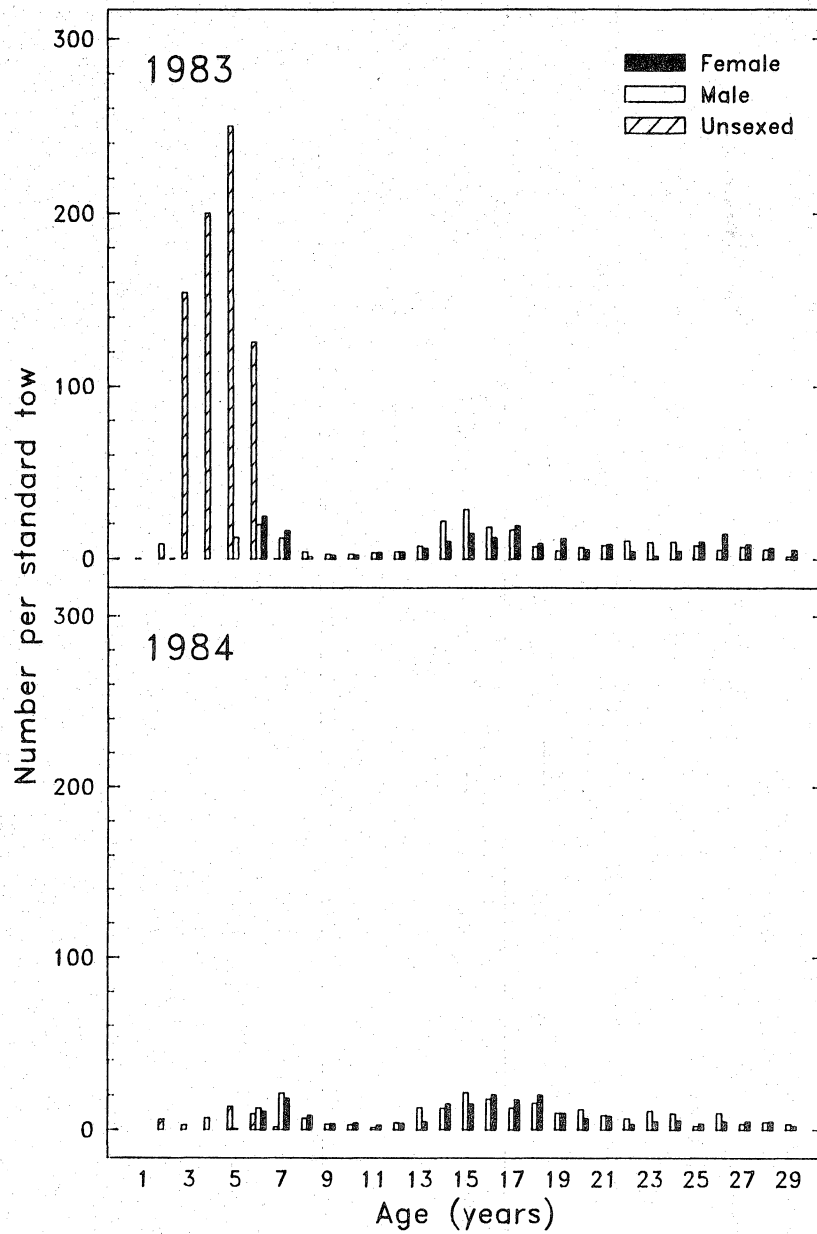


Fig.7: Number of redfish caught at age per standard tow during Canadian research cruises to Div. 3M in Feb. 1983 and 1984.

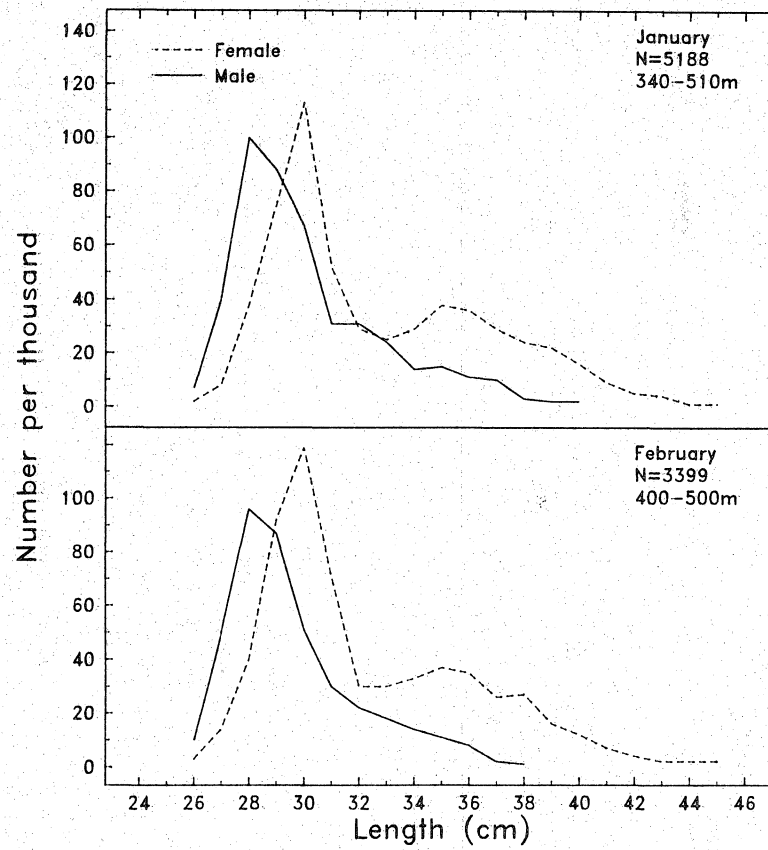


Fig.8: 1983 USSR commercial frequencies (total length) of redfish from Div. 3M (midwater trawl).