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Redfish in NAFO Division 3M

by

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Because of a change in fleet composition in the early 1970's and a lack of data for some years in the 1960's, recent assessments have only incorporated catch/effort data from 1972 onwards. A lack of commercial catch at age data and the short catch/effort series have precluded an analytical assessment or a general production model for the stock.

Methods and Results

Recent nominal catches (Fig. 1. Table 1b) ranged from about 42,000 t in 1972 to about 13,000 t in 1982. From 1975 on, the catches have been fairly stable, averaging about 16,500 t.

Catch and effort data from catches comprising >50 % redfish were used in the multiplicative model (Gavaris 1980) to obtain the standardized CPUE and effort (relative to 1972). The results (Table 1a) indicate that the assumptions of the model have been met.

The standardized effort and CPUE are shown in Table 1b and Fig. 2-3. Since 1978, the catch rate has increased steadily and was the highest of the series in 1981. This increase is related to recruitment of the early 1970's year-classes to the fishery (Fig. 4).

Canadian research survey results for 1982 and 1983 (Fig. 5) show the presence of two very strong year-classes, those of 1980 and 1981. In addition, fish 27-40 cm are prevalent. Between the strong early 1980's year-classes and those of the early 1970's (≃28-30 cm in 1983) are very few fish indicating poor stock recruitment during this period. It is interesting to note that the early 1970's year-classes do not appear as strong in the research survey results as the catch rate series and commercial catch frequencies would suggest.

In last years's assessment (Gavarlis MS 1982) Paloheimo Z's were calculated from the research cruise data. These calculations were not carried out for this assessment because the 1983 data have not been aged to date and, as was noted last year, the 1982 survey did not cover all strata at depth >370 m, due to inciement weather.

The mean numbers caught per tow during the research surveys (Table 2), while fluctuating in the earlier years, show a steady increase since 1981, as a result of the early 1980's yearclasses.

Conclusions

Catch rates have increased steadily since 1978, primarily due to recruitment of the relatively strong early 1970's year-classes. Although these year-classes have appeared strong in the research survey results, the 1983 results suggest that they are being depleted and are no stronger now than are older year-classes. That the commercial fishery is selecting these year-classes is confirmed from the commercial frequencies available. Indications are that recruitment has been poor during the mid to late 1970's, although the year-classes of 1980-81 appear strong. These will recruit to the fishery in the late 1980's. Last year's assessment (Gavaris MS 1982) concluded that fishing may have been about the F_{0+1} level in recent years, although the TAC's have not been achieved. Due to the lack of data on this stock, it is not possible to carry out any further work nor to suggest any change in the TAC.

References

Gavaris, C. A. MS 1982. An assessment of redfish on the Flemish Cap. NAFO SCR 82/V1/58, Ser. No. N551.

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 la. REGRESSION OF MULTIFLICATIVE MODEL

MULTIPLE R.....0.760 MULTIPLE R SQUARED....0.578

ANALYSIS OF VARIANCE

SOURCE OF VARIATION	DF	SUMS OF	MEAN	F-VALUE
INTERCEPT	1	5.011E1	5.011E1	
REGRESSION TYPE 1 TYPE 2 TYPE 3	17 3 5 9	2.082E1 1.306E1 3.693E0 3.404E0	1.224E0 4.353E0 7.385E ⁻¹ 3.782E ⁻¹	11.280 40.102 6.803 3.484
RESIDUALS	140	1.520E1	1.085E-1	
TOTAL	158	8.613E1		

Table 1b. Catches, standardized CPUE and standardized effort for redfish in NAFO Div. 3M.

TOTAL		RELATIVE POWER				
	YEAR	CATCH	FROF,	MEAN	S.E.	EFFORT
			6120 9520 659 669 660			
	1972 1973 1974 1975 1976 1977	41946 22352 34671 16075 16998 20072	0.909 0.893 0.844 0.738 0.705 0.568	1.000 1.037 1.043 0.869 0.789 1.003	0.000 0.159 0.129 0.108 0.110 0.142	41946 21559 33237 18501 21557 20009
	1978 1979 1980 1981	16820 20074 15967	0.653 0.669 0.639 0.756	0.650 0.888 0.990	0.091 0.118 0.144	25887 22598 16128

AVERAGE C.V. FOR THE MEAN:0.124

^aProvisional

Table 2. Mean numbers of redfish caught per standard tow during Canadian research cruises to NAFO Division 3M, 1978-83.

ana an tagan ta fa da sa ta	Year	Mean number/tow	
	1978 1979 1980 1981 1982 1983	719.89 382.41 861.62 678.56 1069.47 1207.72	







Fig. 3: Standardized CPUE for redfish in NAFO Div. 3M.



Fig. 4: USSR commercial length frequencies for 3M redfish, 1982.

