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Divisions 3LN Redfish Stock Assessment

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INTRODUCTION

Insufficient data are available for an analytical assessment of this stock, however, the general production model has been used in the past to assess the Div. 3LN redfish stock. This paper is an update of that assessment incorporating the 1979 catch and effort data.

METHODS AND RESULTS

Table 1 shows the catches of redfish from Div. 3LN from 1959-80 broken down by division. In 1979 the catch in Div. 3L was low relative to that from Div. 3N being only 35% of the total. Thus, the fishery seems to be returning to a pattern of the mid '60's to mid '70's with the greater catches coming from Div. 3N.

In the most recent assessment (McKome MS 1980) the Robson (1966) method of estimating relative fishing power was used to determine the effort and CPUE. For this assessment the multiplicative model (Gavaris MS 1980) was used to standardize CPUE and effort. The data were weighted by effort and the standards were Canada (Nfld.) OTB tonnage classes 4 and 5 combined with Poland OTB tonnage class 7, Div. 3N, and the month of May as these showed the lowest standard error. The multiple R of 0.847 suggests that the assumptions of the model have been met.

Effort was calculated as unlagged values and using 6-, 8- and 10-year running averages (hereafter referred to as lagged). These can be seen along with the trends in catch and CPUE in Table 2 and Fig. 1 and 2.

Regressions of CPUE on effort (unlagged and lagged) can be seen in Fig. 3. The correlation coefficients are all quite low, a reflection of the lack of a wide range of CPUE's and efforts. Although not shown, the 1974 point makes a strong contribution, the correlation coefficients dropping considerably with the omission of this point.

The unlagged data and those using a 6-year running average were shown to have the best correlations and yield curves were constructed using these regressions (Fig. 4). The unlagged curve suggests a yield at 2/3 f_{MSY} of 33,621 MT at an effort (standardized) level of 28,566 hours, while the curve using a 6-year running average gives a yield at 2/3 f_{MSY} of 22,835 MT with a corresponding effort (standardized) of 17,132 hours. The long-term (1959-79) averages of catch and standardized effort are 21,856 MT and 16,160 hours respectfully values closer to the 6-year running average results.

Canadian commercial catch frequencies for 1979 and 1980 (Fig. 5-9) indicate that in 1979 25-35 cm fish were predominant in the midwater trawl catches in July, but fish 35-45 cm predominated in November although the depth of fishing did not change. The 1979 Canadian bottom trawl fishery in Div. 3L indicates fish from 25-48 cm in the catches, with smaller fish predominating when fishing occurred in shallower depths (except Nov.). In 1980 the Div. 3L bottom trawl catches showed fish 25-35 cm in shallower depths in the early part of the year while fish 33-42 cm were predominant at greater depths. In the latter part of the year, fish 22-35 cm became more prevalent in the catches even though the depths fished were greater. In 1979 and 1980, fish 20-32 cm predominated in the Canadian catches in Div. 3N. The predominance of these fish in the USSR catches for the same period can be seen in Fig. 10 and 11.

Canadian research frequencies for Div. 3L and 3N collected in 1980 show a uniform quantity of fish from 22-45 cm in Div. 3L while in Div. 3N fish 20-28 cm and 30-39 cm were most common. The numbers per hour trawled were greater in Div. 3N than Div. 3L.

In summary, this stock appears to be in good condition with the smaller size classes noted in Div. 3N contributing to this fishery in recent years. Although relatively stable catch rates from 1959-79 result in a poor correlation

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of CPUE on effort, the yield curve using a 6-year running average gives results which correspond closely with the long-term average of catch and effort for this stock. Thus, it is suggested that the 1982 TAC remain at 25,000 MT.

REFERENCES

Gavaris, S. 1980. Assessment of the cod stock in Div. 3M. NAFO SCR Doc. 80/II/25, Ser. No. N057.

McKone, W. D. 1980. Division 3LN redfish assessment. NAFO SCR Doc. 80/VI/80, Ser. No. N134.

Year	3L	3N	Total	TAC
1959	34,107	10,478	44,585	
1960	11,463	16,547	28,010	
1961	8349	14,826	23,175	
1962	3425	18,009	21,434	
1963	8191	12,906	21,097	
1964	3898	4206	8104	
1965	9451	4042	13,493	
1966	6927	10,047	16,974	
1967	7684	19,504	27,188	
1968	2348	15,265	17,613	
1969	927	22,142	23,069	
1970	1029	13,359	14,388	
1971	10,043	24,310	34,353	
1972	3095	25,838	28,933	
1973	4709	28,588	33,297	
1974	11,419	10,867	22,286	28,000
1975	3838	14,033	17,871	20,000
1976	15,971	4541	20,512	20,000
1977	13,452	3064	16,516	16,000
1978	6318	5725	12,043	16,000
1979	5584	8483	14,067	18,000
1980 ¹			15,792	25,000

Table 1. Redfish catches in 3LN separated by division.

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¹Provisional

Table 2. 3LN redfish., Catch, effort (standardized) and CPUE (standardized).

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		Effort					
Year	Catch	CPUE	l yr	6 yr f	8 yr f	10 yr f	
1050	44 585	1 603	27,813				
1960	28,010	1.361	20,580				
1961	23,175	1 744	13,288				
1962	21,434	1.754	12,220				
1963	21,097	1.700	12,410				
1964	8104	1.516	5346	15.276			
1965	13,493	1.382	9763	12,268			
1966	16,947	1.812	9353	10,397	13,847		
1967	27,188	1.807	15,046	10,690	12,251		
1968	17,613	1.648	10,688	10,434	11,014	13,651	
1969	23.069	1.333	17,306	11,250	11,517	12,600	
1970	14,388	1.340	10,737	12,149	11,331	11,616	
1971	34.353	1.099	31,258	15,731	13,687	13,413	
1972	28,933	1.491	19,405	17,407	15,445	14,131	
1973	33,297	1.472	22,620	18,669	17,052	15,152	
1974	22,286	0.585	38,096	23,237	20,645	18,427	
1975	17,871	1.340	13,337	22,576	20,431	18,785	
1976	20,512	1.253	16,370	23,514	21,141	19,486	
1977	16,516	1.568	10,533	20,060	20,295	19,035	
1978	12,043	1.012	11,900	18,809	20,440	19,156	
1979	14,067	1.246	11,290	16,921	17,944	18,555	



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Fig. 2. Unlagged and 6, 8 and 10 year lagged effort for redfish in NAFO Divisions 3LN.







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Fig. 5. Canadian (Nfld.) commercial length frequencies of redfish caught in 3L in 1979 using midwater trawl.



LENGTH (CM) Fig. 6. Canadian (Nfld.) commercial length frequencies of redfish caught in 3L in 1979 using bottom trawl.

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Fig. 8. Canadian (Maritime) commercial length frequencies of redfish caught in 3L and 3N in 1980 using bottom trawl.





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