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Redfish in Divisions 3LN

by

D. B. Atkinson
Fisheries Research Branch
Department of Fisheries and Oceans
P. O. Box 5667
St. John's, Newfoundland
A1C 5X1

Introduction

Insufficient data preclude the use of analytical techniques in the assessment of this stock. In the past, the general production model was used but it was shown by Atkinson (MS. 1982) that the regression of CPUE on effort is dependent upon the 1968 and 1974 points which were considered to be anomalous and low. The catch/effort data for these years represent only 2.2% and 0.3% of the total catches respectively. Catch curves based on a 1979 Canadian research cruise to 3LN suggested an F of 0.12 and it was, therefore, felt that historic catches averaging about 22,000 t approximated the $F_0 = 1$ level.

Methods and Results

Table 1 and Fig. 1 show the nominal catches in Div. 3LN. It can be seen (Table 1) that except for a few years catches in 3N have been greater than those in 3L. Commercial frequencies in 3L (Fig. 4-6) indicate a wide range of lengths in the catches while those from 3N (Fig. 7, 8) suggest smaller fish (20-30 cm) in the USSR catches and Canadian shallower catches while larger fish were caught when fishing was conducted at greater depths. The differences in lengths between the two areas can be attributed to the bad bottom in deeper waters of Div. 3N.

The multiplicative model (Gavaris 1980) was again used to standardize the catch rates. The regression results (Table 2a) indicate that the conditions of the model have been met. Table 2b and Fig. 2-3 show the standardized (to 1959) effort and CPUE. Excluding the 1968 and 1974 points, the catch rates were fairly steady up to 1980 when an increase occurred. The 1982 point is the highest on record although it must be viewed with caution at present as only Newfoundland vessels were included in the calculation. Regressions of CPUE on effort were not carried out because of last year's findings.

In recent years Canadian research surveys have not covered all redfish depths so no new data are available. The results of a USSR research cruise to 3LN in 1982 (Fig. 9) suggests the presence of larger fish in 3L but this may be related to the bad bottom at greater depths in 3N.

Discussion

Although the standardized catch rate series shows an increase since 1979, the lack of data prevents any indepth analysis of this stock. The wide range of lengths in the commercial catches however, suggests a healthy population.

References

Atkinson, D. B. MS 1982. Analysis of data on redfish in Div. 3LN. NAFO SCR Doc. 82/VI/59.
Ser. No. N552.

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. Redfish catches in 3LN, separated by division.

Year	3L	3N	Total	TAC
1959	34,107	10,478	44,585	
1960	11,463	16,547	28,010	
1961	8,349	14,826	23,175	
1962	3,425	18,009	21,434	
1963	8,191	12,906	21,097	
1964	3,898	4,206	8,104	
1965	9,451	4,042	13,493	
1966	6,927	10,047	16,974	
1967	7,684	19,504	27,188	
1968	2,348	15,265	17,613	
1969	927	22,142	23,069	
1970	1,029	13,359	14,388	
1971	10,043	24,310	34,353	
1972	3,095	25,838	28,933	
1973	4,709	28,588	33,297	
1974	11,419	10,867	22,286	28,000
1975	3,838	14,033	17,871	20,000
1976	15,971	4,541	20,512	20,000
1977	13,452	3,064	16,516	16,000
1978	6,318	5,725	12,043	16,000
1979	5,584	8,483	14,067	18,000
1980	4,367	11,663	16,030	25,000
1981	9,407	14,843	24,280	25,000
1982 ^a			20,790	25,000

^aProvisional

Table 2a. REGRESSION OF MULTIPLICATIVE MODEL

MULTIPLE R.....0.691
MULTIPLE R SQUARED....0.477

ANALYSIS OF VARIANCE

SOURCE OF VARIATION	DF	SUMS OF SQUARES	MEAN SQUARES	F-VALUE
INTERCEPT	1	5.211E0	5.211E0	
REGRESSION	37	7.965E1	2.153E0	10.239
TYPE 1	7	4.115E1	5.879E0	27.958
TYPE 2	6	6.138E0	1.023E0	4.866
TYPE 3	1	2.736E0	2.736E0	13.012
TYPE 4	23	1.724E1	7.494E-1	3.564
RESIDUALS	415	8.725E1	2.103E-1	
TOTAL	453	1.721E2		

Table 2b. PREDICTED RELATIVE POWER

YEAR	TOTAL CATCH	PROP.	RELATIVE POWER		
			MEAN	S.E.	EFFORT
1959	44585	0.501	1.000	0.000	44585
1960	28010	0.131	0.860	0.123	32572
1961	23175	0.226	0.875	0.125	26492
1962	21434	0.404	0.953	0.122	22503
1963	21097	0.511	0.831	0.112	25378
1964	8104	0.397	0.864	0.141	9384
1965	13493	0.210	0.803	0.132	16801
1966	16974	0.214	0.907	0.131	18713
1967	27188	0.086	0.751	0.174	36189
1968	17613	0.022	0.363	0.067	48575
1969	23069	0.833	0.672	0.093	34337
1970	14388	0.339	0.691	0.098	20812
1971	34353	0.350	0.663	0.114	51831
1972	28933	0.791	0.728	0.105	39744
1973	33297	0.080	0.802	0.135	41537
1974	22286	0.003	0.313	0.076	71205
1975	17871	0.550	0.838	0.137	21336
1976	20512	0.454	0.852	0.108	24072
1977	16516	0.549	0.835	0.107	19777
1978	12043	0.642	0.703	0.091	17120
1979	14067	0.647	0.767	0.099	18330
1980	16029	0.588	1.134	0.162	14137
1981	24280	0.425	1.080	0.155	22473
1982	20790	0.281	1.440	0.217	14442

AVERAGE C.V. FOR THE MEAN: 0.148

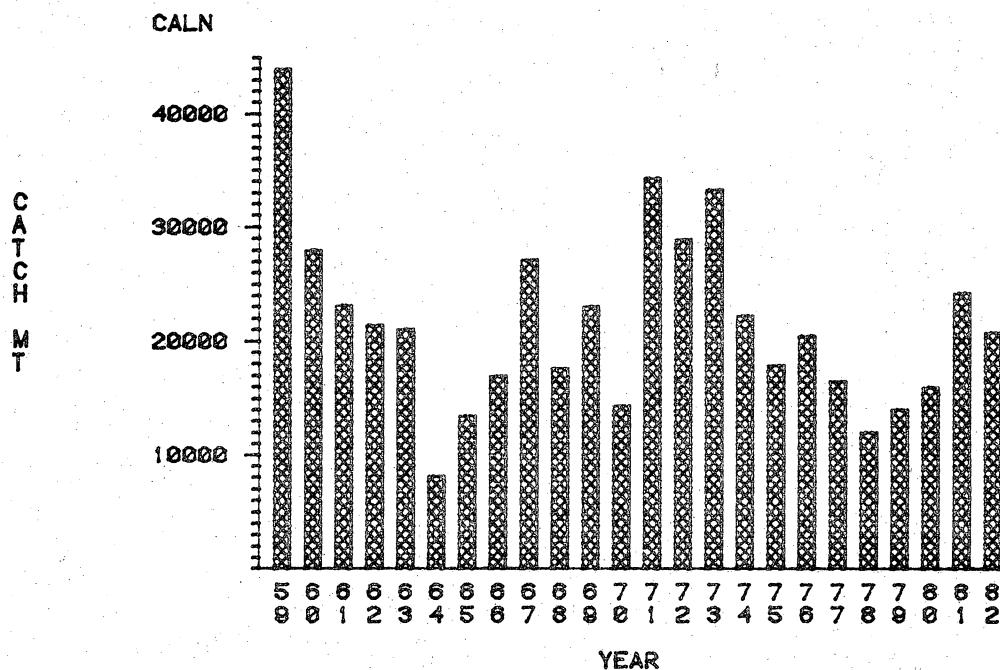


FIG.1: NOMINAL CATCHES OF REDFISH IN NAFO DIV.3LN
(1982 IS PROVISIONAL)

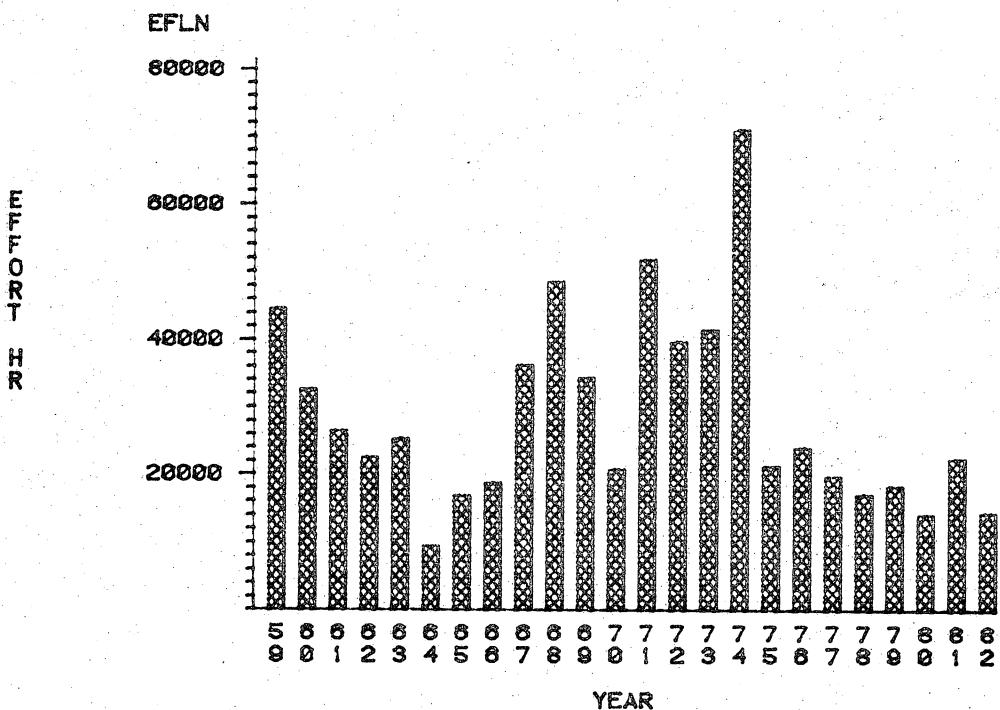


FIG.2: STANDARDIZED EFFORT FOR REDFISH IN DIV.3LN
(MARITIMES AND QUEBEC DELETED)

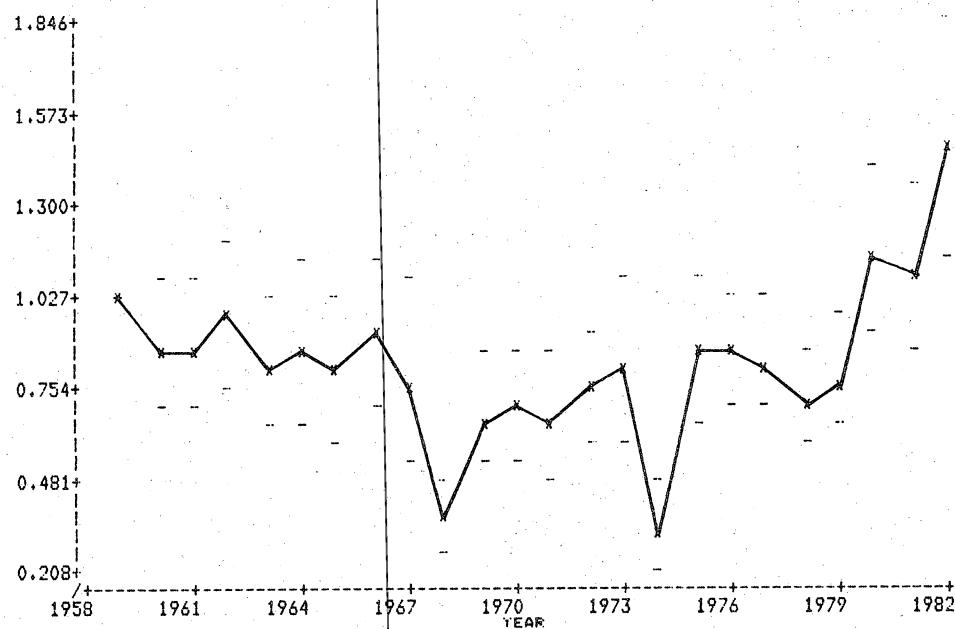


Fig. 3. Standardized CPUE for redfish in NAFO Division 3LN.

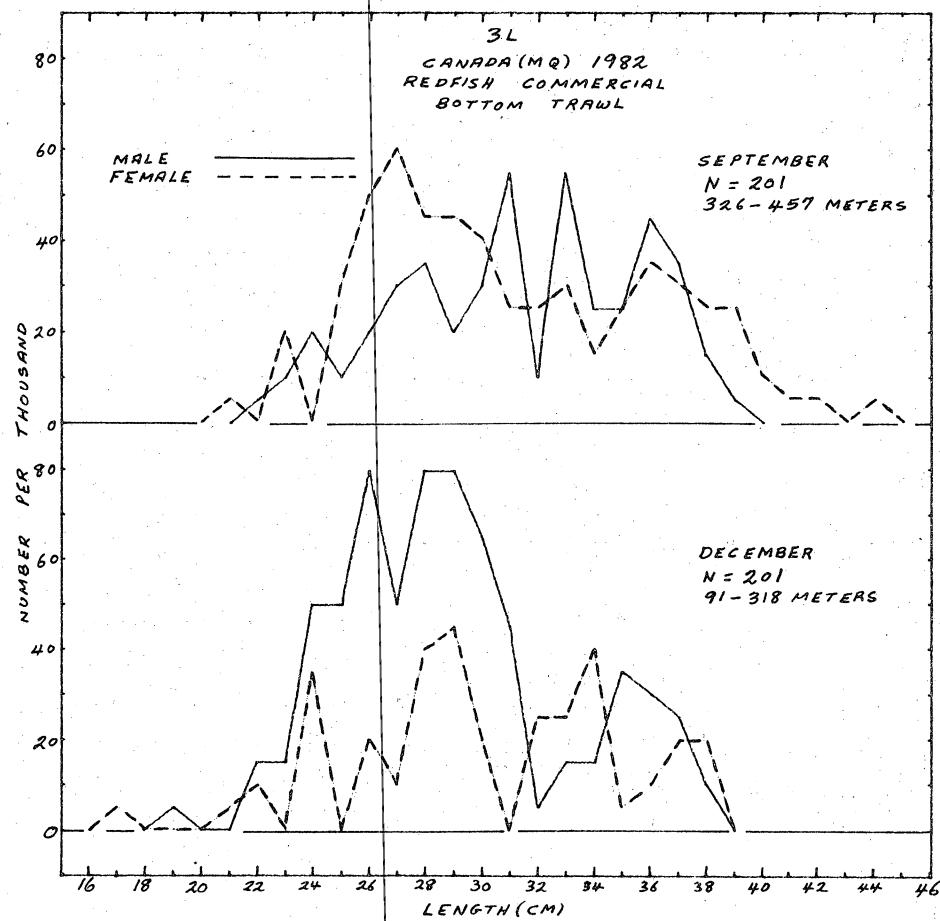


Fig. 4. Canada (Maritimes and Quebec) commercial redfish length frequencies 3L, 1982 (port sampling).

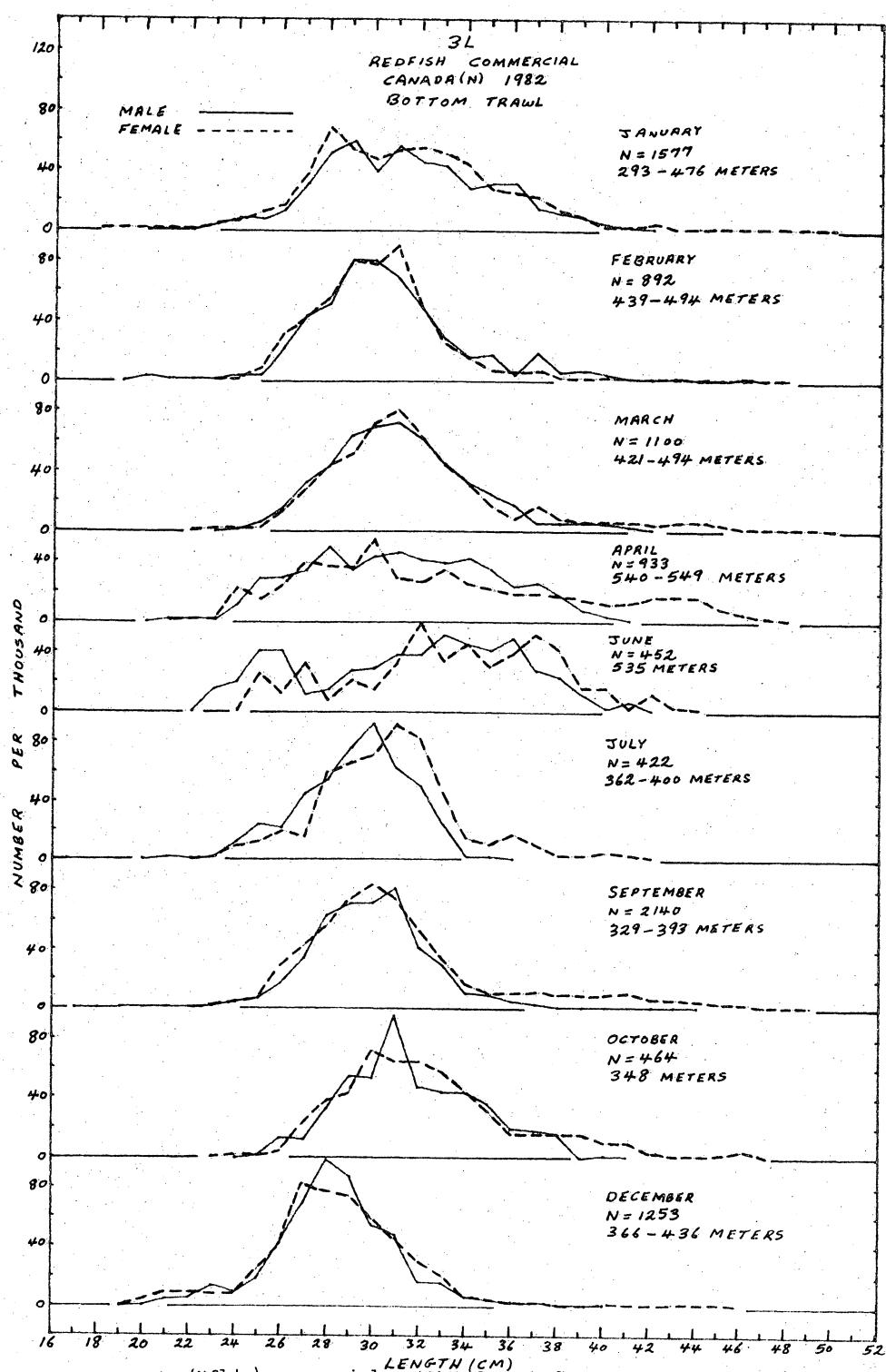


Fig. 5. Canada (Nfld.) commercial redfish length frequencies 3L, 1982 (port sampling).

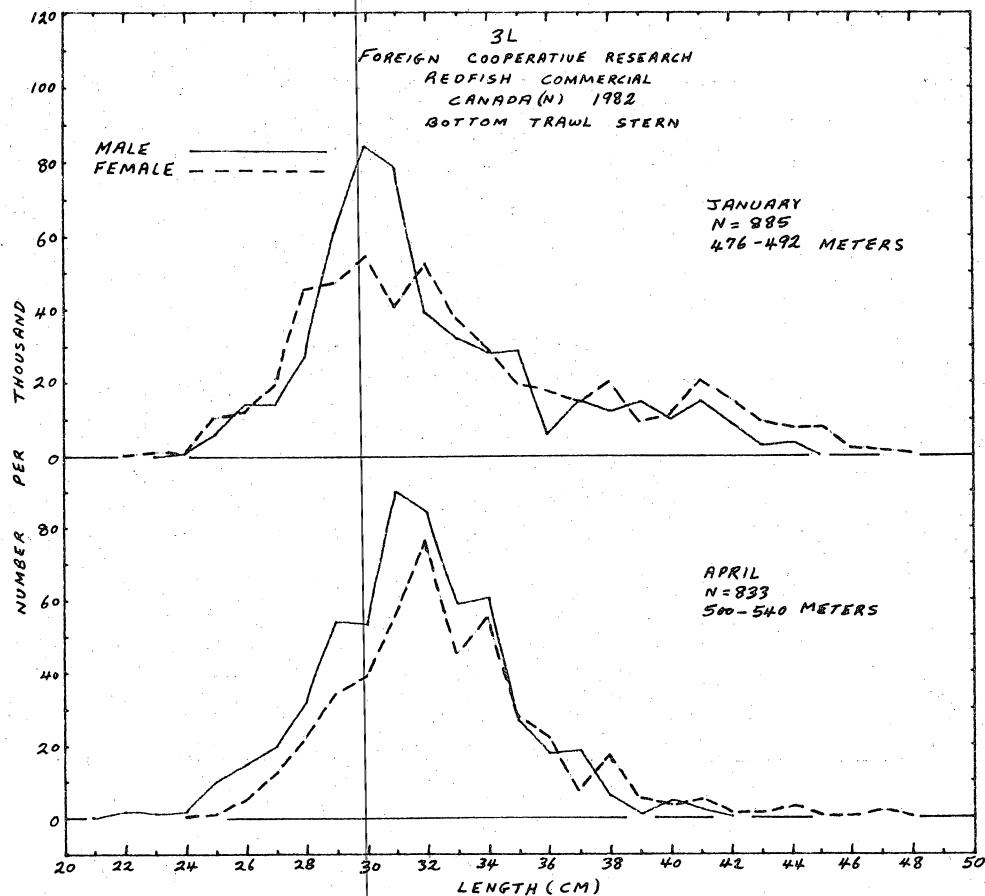


Fig. 6. Canada (Nfld.) commercial redfish length frequencies 3L, 1982 (Foreign Cooperative Research).

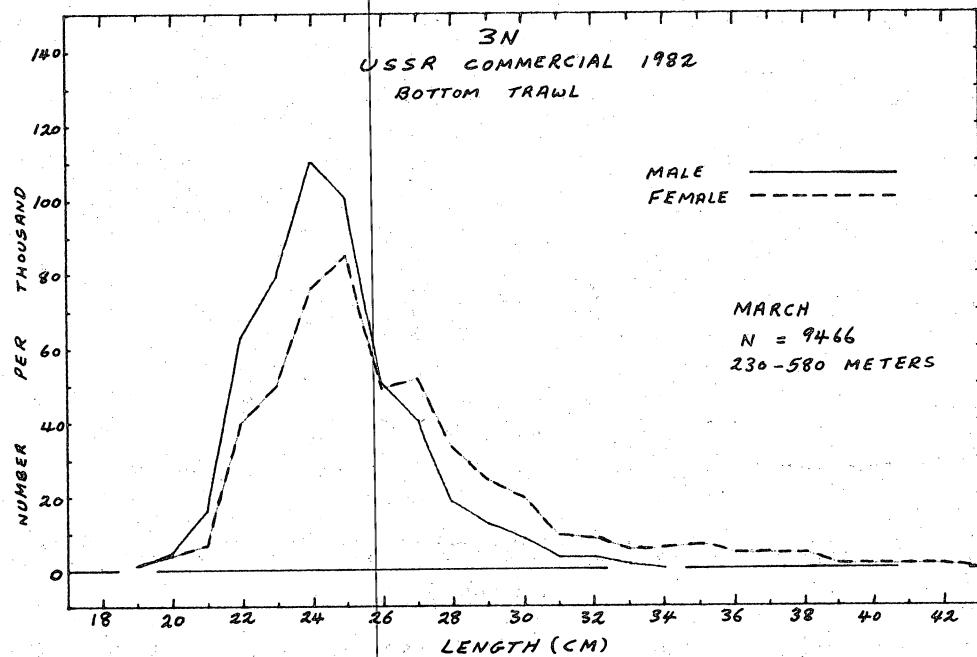


Fig. 7. USSR commercial redfish length frequencies 3N, 1982.

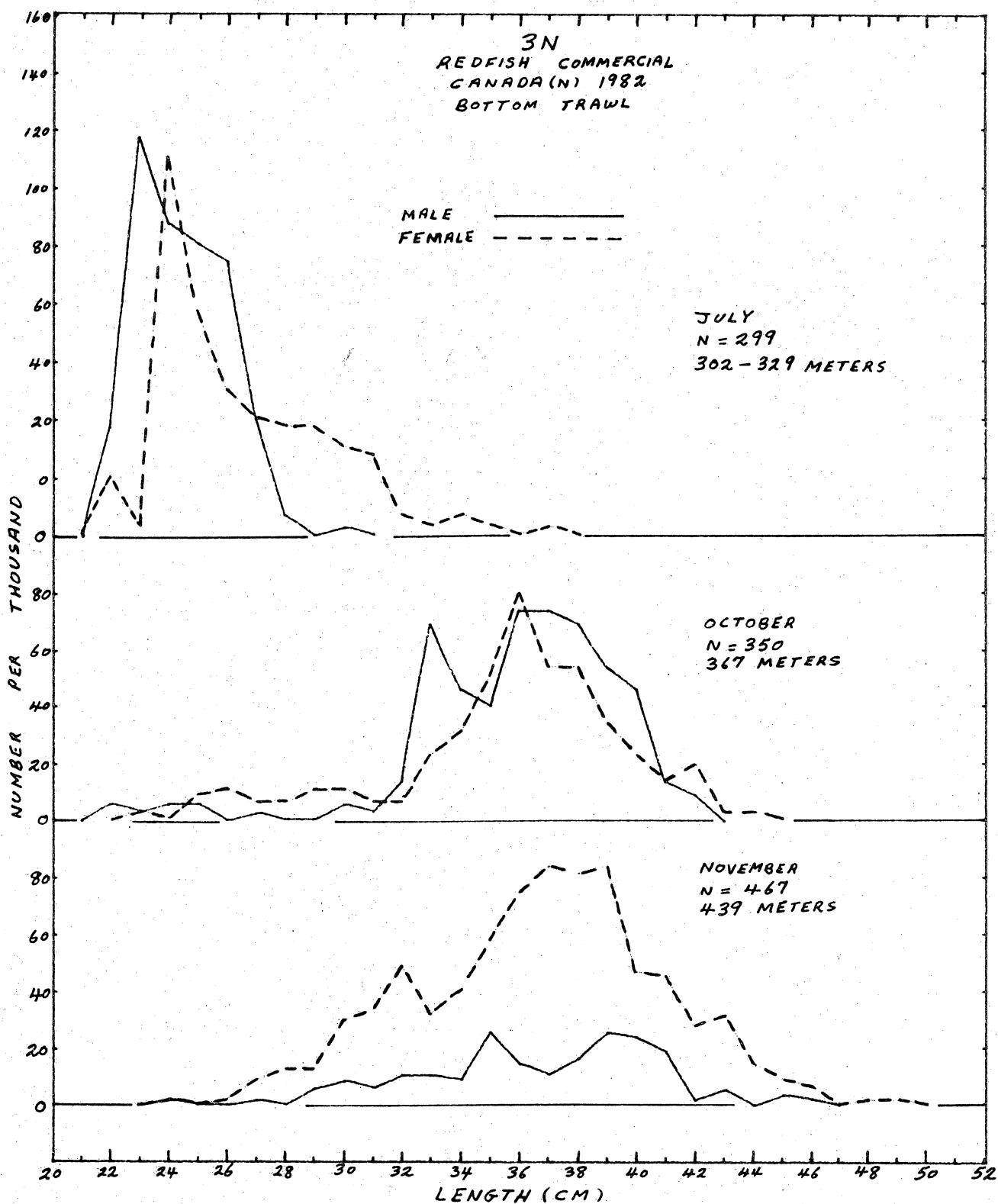


Fig. 8. Canada (Nfld.) commercial redfish length frequencies 3N, 1982 (port sampling).

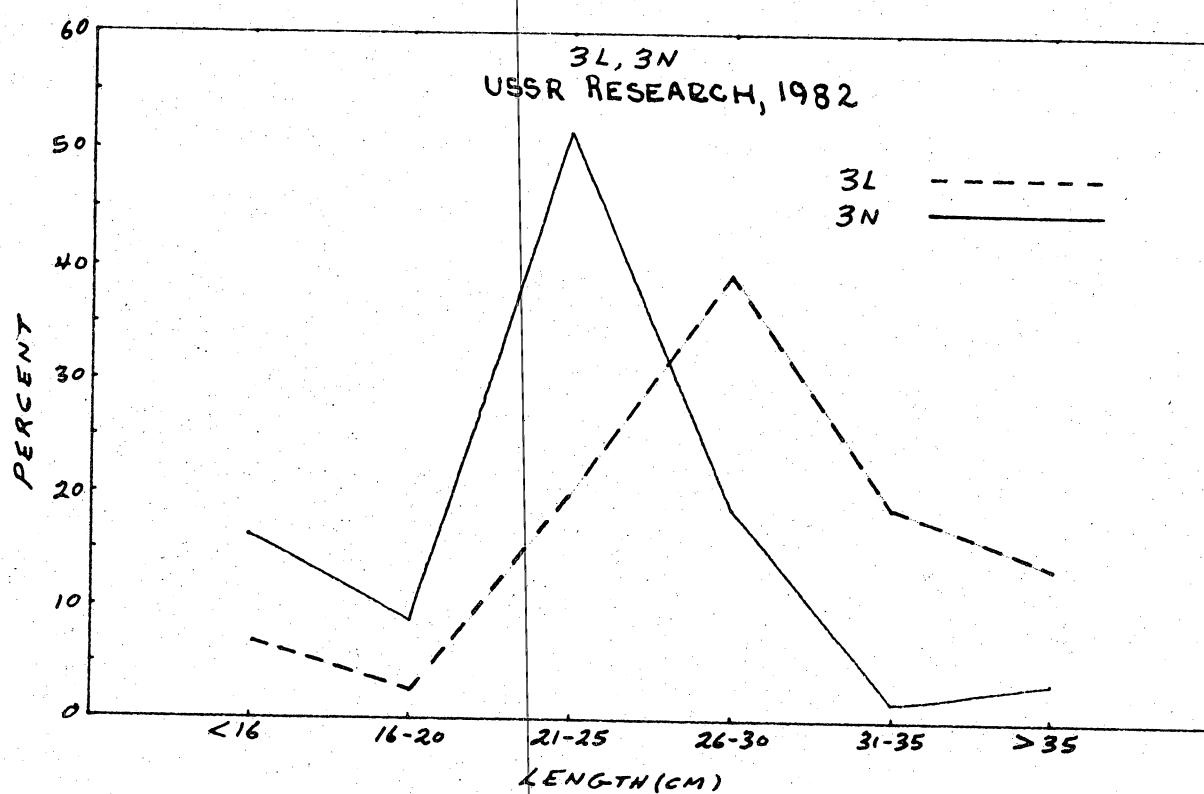


Fig. 9. USSR research length frequencies 3LN, 1982.

