



SCIENTIFIC COUNCIL MEETING – JUNE 2003

Assessment of By-catches of Young Redfish During Fishery for Shrimp in Division 3M
by Data of the Russian Fishery in 2002

by

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Abstract

Ranges of shrimp fishing depth overlapped partly only in February/March. Fishing grounds were spatially isolated during the entire year. By-catches of redfish consisted of fish 6-20 cm, predominantly, 12-14 cm. Young fish with the length <12 cm constituted 21.8%. By-catches of redfish in percentage of catches' weight fluctuated from 0 to 4.89%. Re-calculating per the entire Russian catch of shrimp in 2002, it is possible to assess the weight and a number of redfish by-caught at the level 28.256 tons and 974 344.8 specimens, correspondingly.

Introduction

Information presented in the given paper was prepared in accordance with the STACFIS recommendations drawn up by the NAFO Scientific Council in June 2002. The main task of investigations was the estimation of distribution of commercial catches of shrimp and redfish, as well as of a number and biomass of redfish caught during the directed fishing for shrimp in Div. 3M in 2002.

Materials and Methods

Materials for this paper were collected by an observer of PINRO worked onboard of fishing vessel P-0618 "Alexandrit" from June to December 2002. For shrimp fishery, a trawl with a minimum mesh size of 40 mm was used; it was equipped with a sorting grid, the maximum spacing between the bars was 22 cm. The size of redfish by-catch was determined by counting of a number of fish in the arbitrary chosen part of a catch with the subsequent recalculation by the length-weight key per the entire catch. Totally, 248 catches of shrimp were examined; the length composition of redfish was determined in 38 of them. Total length of fish was measured.

Statistically significant relationship between by-catches of redfish both by weight (t) and a number (specimens) and shrimp catches (correlation coefficients constituted 0.903 and 0.850, correspondingly) was revealed. By-catches of redfish obtained for the entire period of fishery for shrimp onboard of P-0618 were recalculated then per the total Russian catch.

Results

In 2002, four Russian vessels participated in the fishery for deepwater shrimp on the Flemish Cap. Fishery began in January 2002 on the western and northwestern slopes of the bank (Fig. 1). Depths varied from 300 to 340 m. In February/March, the main fishing grounds shifted to the northern and northeastern slopes. Concentrations of shrimp were fished at the depth from 250 to 410 m.

In April/May, the Russian vessels did not participate in the fishery for shrimp on the Flemish Cap. In June, one vessel resumed fishery and fished for concentrations on the western and northeastern slopes of the bank. From July to October, fishing was carried out on the western and eastern slopes at depths 290-340 m. In November/December, the Russian fishery for shrimp was practically ceased.

In 2002, redfish catches were taken from January to August; however, the directed fishery for this species was actually carried out from the middle of June to the early August, when about 80% of the total catch was taken. Fishing for redfish was conducted on the southern and southwestern slopes of the Flemish Cap at the depth 350-500 m (Fig. 1).

Analyzing peculiarities of fishery on the Flemish Cap in 2002, it should be mentioned that depths of fishing for shrimp and redfish partly overlapped only in February/March, but they were spatially isolated during the entire year. By-catches of redfish consisted of fish 6-20 cm, predominantly, 12-14 cm. Young fish with the length <12 cm constituted 21.8% (Table 1).

Redfish weight in shrimp catches per one trawling fluctuated from 0 to 0.25 tons, their abundance – from 0 to 7 015 spec., and in percentage (by weight) – from 0 to 4.89% (Fig. 2, Table 2). In accordance with the presently available data, the preliminary catch of shrimp in 2002 was estimated at 1 176 tons. Using data derived in the present paper per total Russian catch of shrimp, it is possible to assess the weight and a number of redfish by-catch per a year at the level about 29 tons and 1mill. spec., correspondingly.

Table 1. Length composition of redfish by-catch on Flemish Cap in 2002.

Length, mm	Av. weight, g	Specimens	Percent
60	4.9	19	0.022
70	4.5	451	0.525
80	6.2	871	1.014
90	9.1	2337	2.720
100	13.3	5484	6.383
110	16.3	9551	11.117
Subtotal <12 cm	13.8	18713	21.781
120	21.4	16920	19.694
130	28.3	21015	24.460
140	34.6	14793	17.218
150	45.7	7452	8.674
160	51.5	3695	4.301
170	62.2	2102	2.447
180	80.9	844	0.982
190	92.8	347	0.404
200	109.9	34	0.040
Subtotal ≥12 cm	33.3	67202	78.219
Total	29.0	85915	100.000

Table 2. Weight and number of redfish by-catch on Flemish Cap in 2002.

	Redfish by-catch			Shrimp catch
	T	%	Specimens	T
Mean		2.453		
Min		0.000		
Max		4.890		
St. err.		0.036		
St. dev.		0.567		
Conf. level (95%)		0.071		
Total				566.166
Tows processed		248		248
	Mean	28.847	994733,8	1176
Total catch of Russia	Min	28.012	965942,1	
	Max	29.682	1 023525,5	

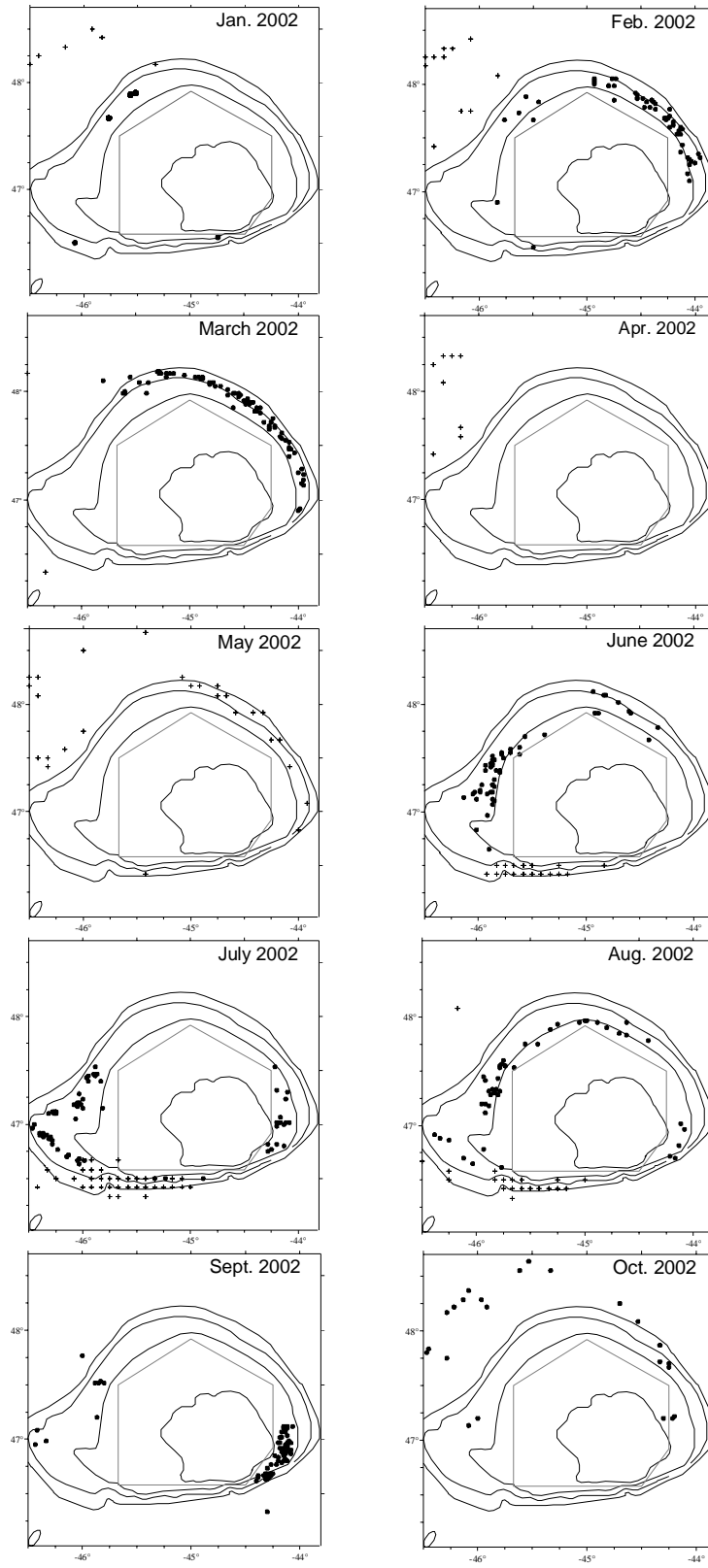


Fig. 1. Fishery distribution of shrimp (dot) and redfish (cross) on Flemish Cap in 2002.

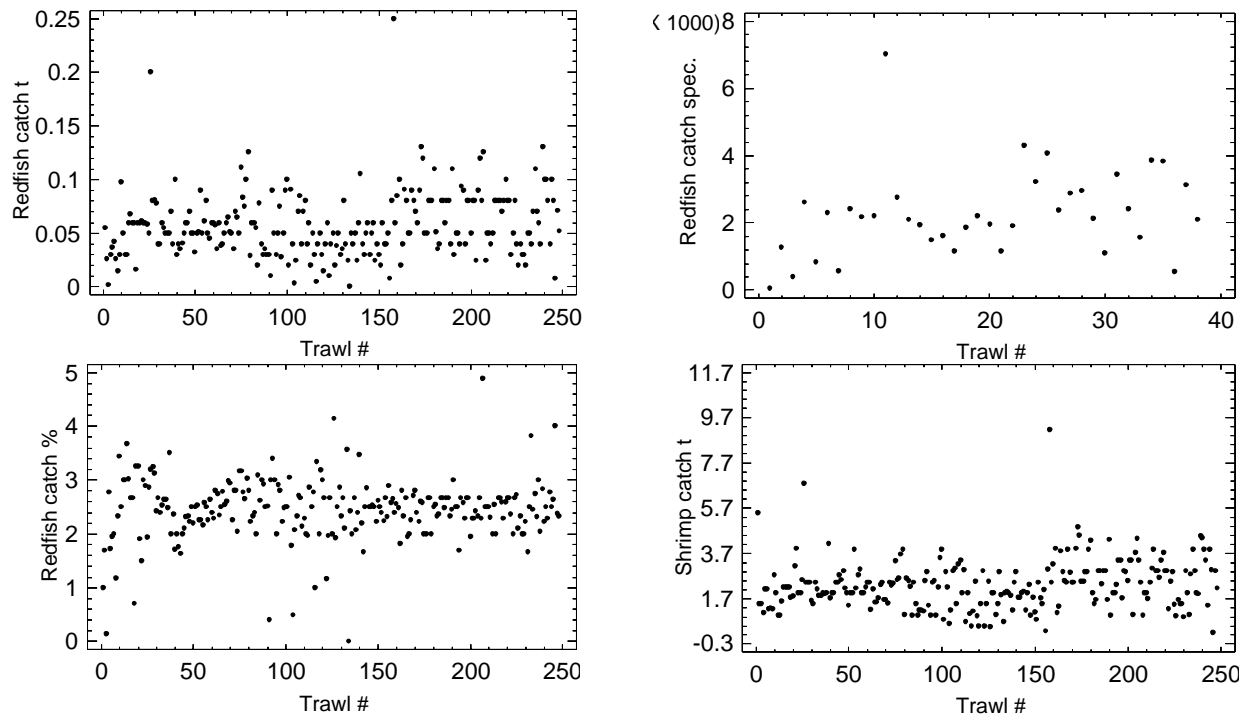


Fig. 2. Redfish by-catch (t, specimens, %) and shrimp catch (t) on Flemish Cap in 2002.