



SCIENTIFIC COUNCIL MEETING – September 2005

The By-catch in the Shrimp Fishery of Iceland at Flemish Cap in 1996-2005

by

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Abstract

The data presented are collected by observers onboard Icelandic vessels all year round at Flemish Cap in years 1996-2005. The by-catch as a whole was about 2% in 1996 but has decreased gradually since 1997 to 0.3% in 2002; to increase to about 0.50% in the years 2003-2005. There are mainly three species in the by-catch of the shrimp fishery, Greenland halibut, wolffish and redfish, where redfish is by the most prevalent. The redfish by-catch has fallen from 1.6% in 1996 to 0.26% in 2002 to rise again to some 0.46- 0.50 in years 2003 through 2005. Other species were wolffish, Greenland halibut and American plaice. Cod was seen for the first and only time in April 1999, but has not been seen since as by-catch.

If all vessels in the shrimp fishery of Flemish Cap fishing at the same rate as Icelanders then as much as 124 to 774 tons would have been caught annually, the peak being in 1996.

A prominent year-class of redfish species appears in the beginning of year 2000 at the size of 8 cm. This year-class is still noticeable as 2003 at the size of 17 cm, a growth of 9 cm in four years.

Introduction

The by-catch in the shrimp fishery at Flemish Cap has become less serious with years. The distance between bars in the Nordmoor grate was 28 mm in the years prior to 1996. By 1996, 22 mm space was mandatory. There were no Icelandic observers till year 1996 so the data only reach back to year 1996. The data are here compiled for the years 1996-2005. By 2004 observer coverage of Icelandic shrimp vessels was reduced to 50% so data are getting scantier.

Materials and Methods

In the shrimp fishery all vessels use a gear with mesh size 40 mm (open mesh) in codend or sometimes a larger mesh. A sample of 30-60 kg of unsorted catch is sorted into shrimp and the main fish species. Each species of fish, cod, redfish Greenland halibut, wolffish and American plaice is measured to the nearest 1 cm, counted and weighed. The remaining shrimp in the sample is also weighed. From the proportions between shrimp in the sample (30-60 kg) and the weight of shrimp in the haul, the numbers and weight of the different species of fish is raised to that of the whole catch of shrimp in the haul. Only the catch of the hauls when by-catch is investigated thoroughly is used. If the observer does not fill in the by-catch report the shrimp catch from these hauls are omitted.

Results

Neither redfish nor wolffish were divided into species as the observers were not capable of recognising the different species. As the by-catch was usually very low it was sometimes difficult to get the observers to analyse the by-catch properly. Therefore the catch of shrimp representing the catch investigated is usually quite small.

The by-catch was about 0.27% in 2002, 0.9% in 2000 and 0.8% in 2001 as compared to 0.8% of the shrimp catch in 1999 and 1998, 1.8% in 1997 and 2% in 1996. Most of this was redfish or 0.7-0.8% in the years 1999 to 2001. Other species were wolffish, Greenland halibut and American plaice. Cod was seen for the first and only time in April 1999, but has not been seen since as by-catch (Table 1). To see how much redfish is caught as by-catch in the shrimp fishery at Flemish Cap the percentage based on Icelandic by-catch data alone and nominal catch of shrimp per year would result in 124 to 770 tons of redfish being caught per year, the peak being in 1996 (Table 2). Similarly by-catch of wolffish would be between 0 and 164 tons per year. Greenland halibut is the third most important ranging from 1 to 69 tons per year. By-catch of other species is negligible. By-catch of Icelandic vessels has been described before (Skuladottir, 1998 and 2003).

The length frequencies of redfish are presented in Fig. 1-4. The length frequencies were compiled into quarterly length frequency distributions (lfd). Looking at those one can speculate that a year-class of redfish can be suspected to appear in January-March in 2000 at size 8 cm. If this peak is followed it seems to grow very slowly and be about 10 cm in April-June 2001, becoming 15 cm in July-September 2002 and 17 cm in April-June in 2003. But considering the very few samples and shortcomings of the observers in not being able to detect the different species of redfish it is possible that the peak is not of the same species in all months.

There are very few measurements of other by-catch species. However the very few that we have for Greenland halibut are presented here for the years 2003-2005 Fig. 5 and 6.

References

- SKÚLADÓTTIR, U. 1998. The By-catch in the shrimp fishery of Iceland at Flemish Cap in 1997 and 1998. *NAFO SCR Doc.*, No. 29, Serial No. N3016, 5 p.
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TABLE 1. By-catch of fish in the shrimp fisheries on Flemish Cap in the years 1996-2005 as observed by Icelandic observers.

Year	Redfish		Wolffish		Greenland Halibut		American plaice		cod		Shrimp Weight kg	Bycatch % per catch of shrimp	Bycatch % by species				
	number	Weight kg	number	Weight kg	number	Weight kg	number	Weight kg	number	Weight kg			Redfish	Wolffish	Greenland halibut	American plaice	Cod
1996	1257584	57996	324562	12284	97626	5198					3618871	2.09	1.603	0.339	0.144		
1997	824719	43404	149510	7614	52762	6410					3138487	1.83	1.383	0.243	0.204		
1998	80462	1878	6816	285	3115	124					299501	0.76	0.627	0.095	0.041		
1999	595284	23724	51694	2425	19923	3468	3794	245	70	14	3037052	0.98	0.781	0.080	0.114	0.008	0.0005
2000	761993	18749	95651	9030	17008	1443	3324	217	0	0	3345551	0.88	0.560	0.270	0.043	0.006	0.0000
2001	608731	14191	12304	456	2052	187	1344	68	0	0	1900216	0.78	0.747	0.024	0.010	0.004	0.0000
2002	153584	3237	4935	85	1801	19	1300	34	0	0	1267913	0.27	0.255	0.007	0.001	0.003	0.0000
2003	422215	11702	26618	433	3882	105	0	0	0	0	2328777	0.53	0.502	0.019	0.005	0.000	0.0000
2004	75165	4637	85	1	1302	30	0	0	0	0	1009359	0.46	0.459	0.000	0.003	0.000	0.0000
2005	37573	2094	111	9	906	78	0	0	0	0	430750	0.51	0.486	0.002	0.018	0.000	0.0000

TABLE 2. The calculated catch (tons) of the main by-catch species in the years 1996-2005 as percentage of the nominal catch of shrimp if by-catch of all countries were the same as that of Iceland.

Year	Nominal Catch Shrimp tons	Total Red- fish caught tons	Total Wolf- fish caught tons	Greenland halibut tons	American plaice tons	cod tons
1996	48300	774.1	164.0	69.4		
1997	24675	341.2	59.9	50.4		
1998	30308	190.0	28.8	12.5		
1999	43438	339.3	34.7	49.6	3.5	0.2
2000	50311	282.0	135.8	21.7	3.3	0.0
2001	53922	402.7	12.9	5.3	1.9	0.0
2002	48605	124.1	3.3	0.7	1.3	0.0
2003	62165	312.4	11.6	2.8	0.0	0.0
2004	46991	215.9	0.0	1.4	0.0	0.0
2005*	8000	38.9	0.2	1.4	0.0	0.0

*provisional

Redfish 3M

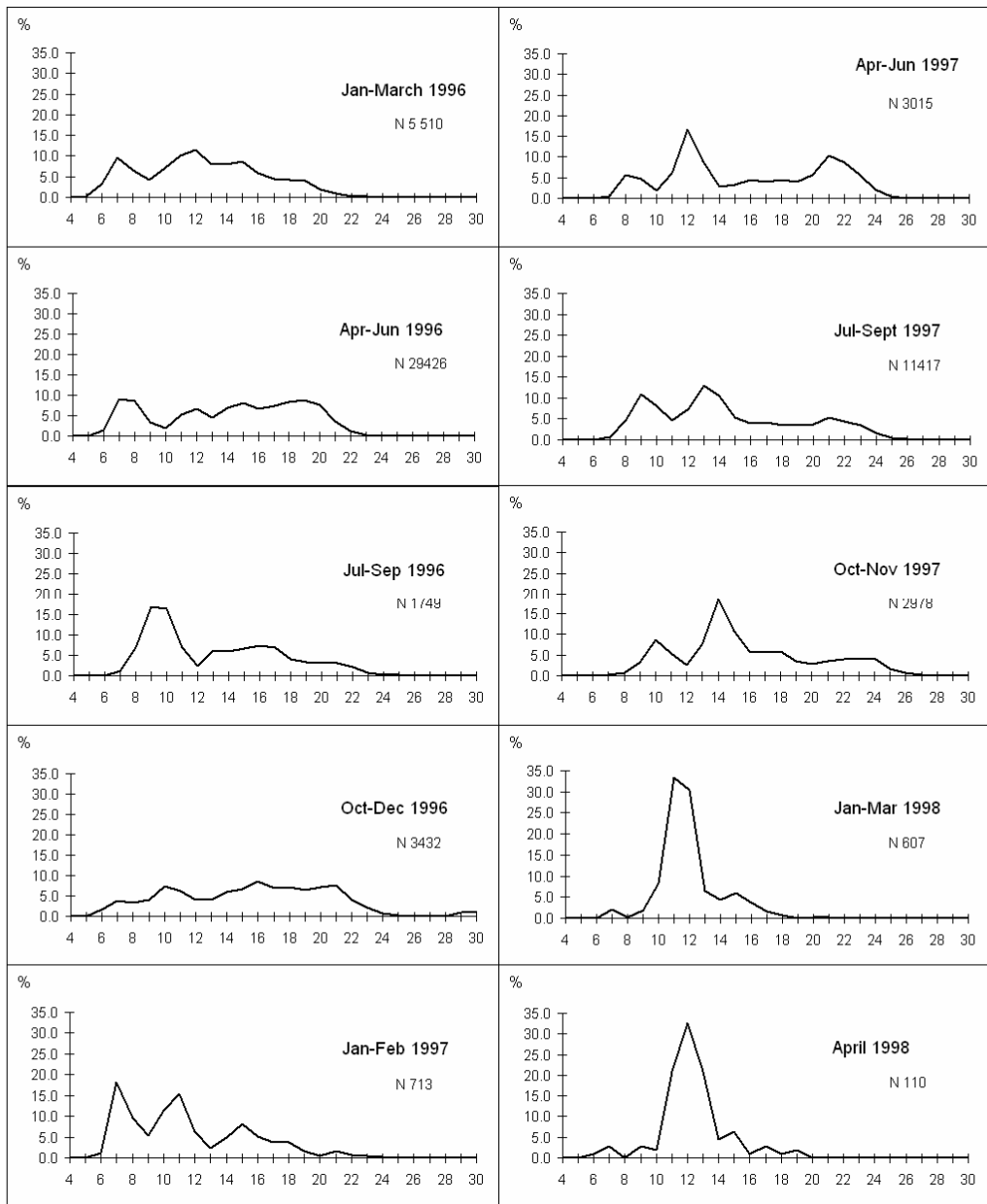


FIG. 1. Redfish in Div. 3M: Length distributions of redfish caught in a shrimp trawl after passing through a 22 mm sorting grate in 1996-1998.

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Redfish 3M

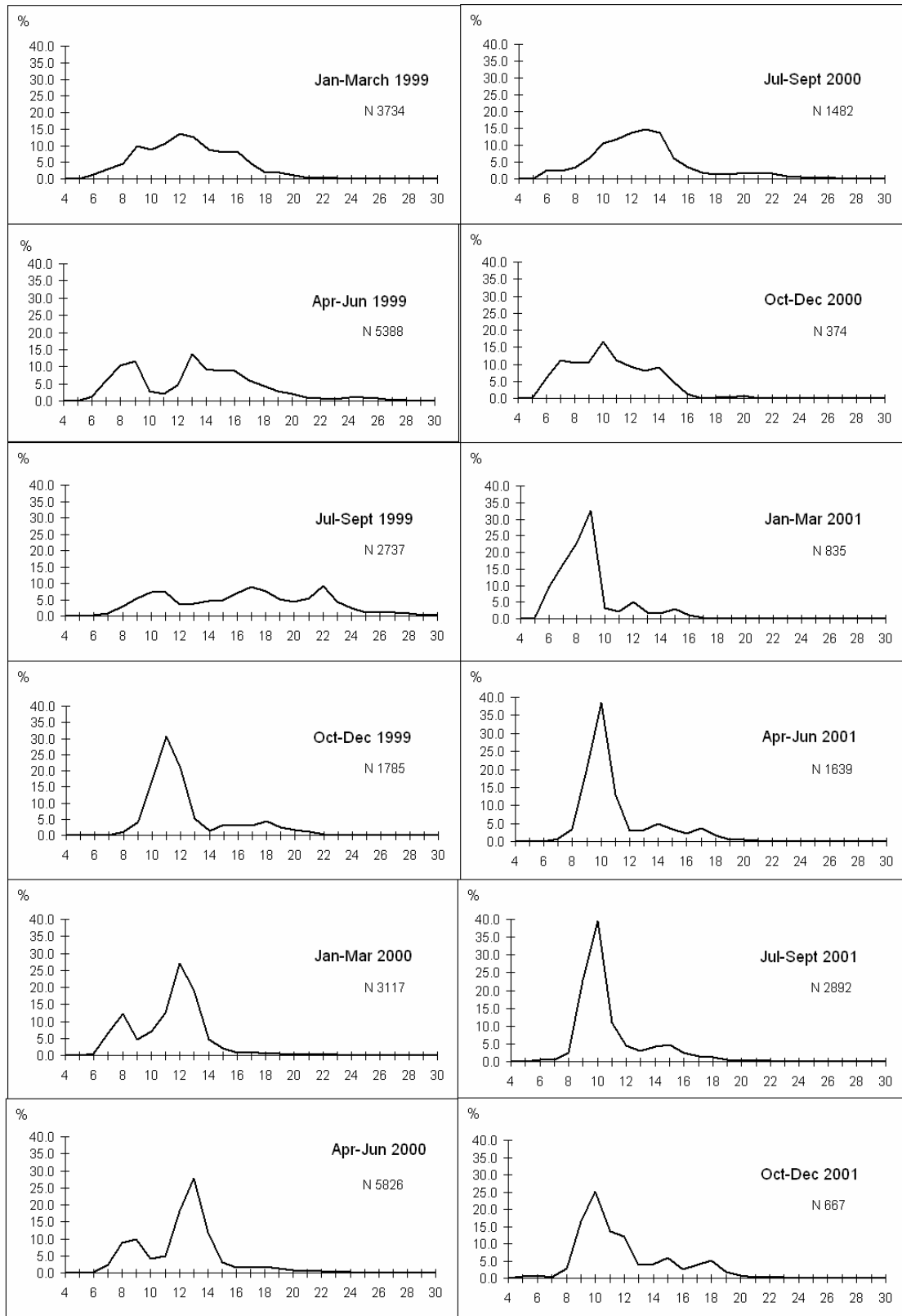


Fig. 2. Redfish in Div. 3M: length distributions of redfish caught in a shrimp trawl after passing through a 22 mm sorting grate in 1999-2001.

Redfish 3M

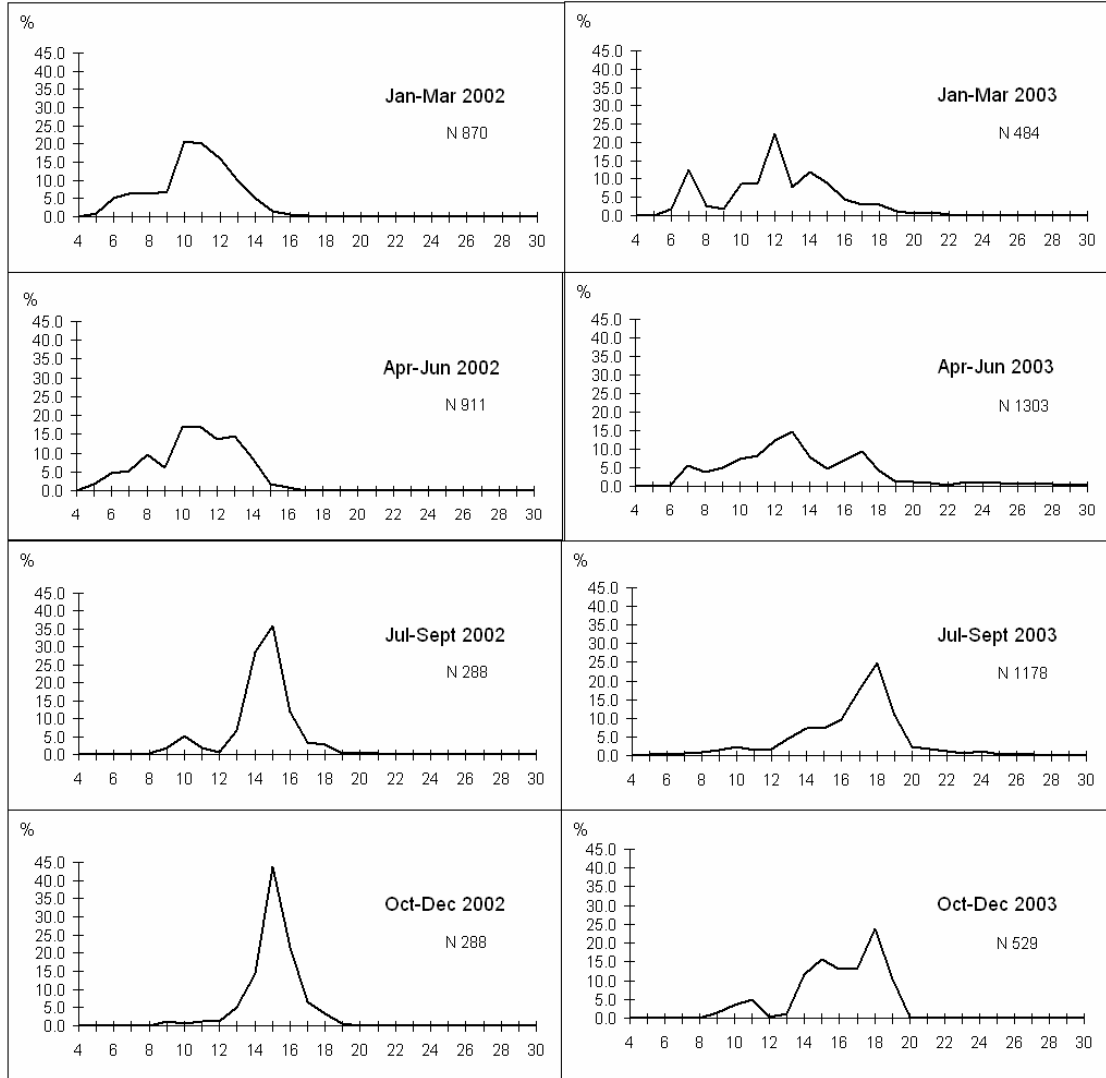


Fig. 3. Redfish in Div. 3M: length distributions of redfish caught in a shrimp trawl after passing through a 22 mm sorting grate in 2002-2003.

Redfish 3M

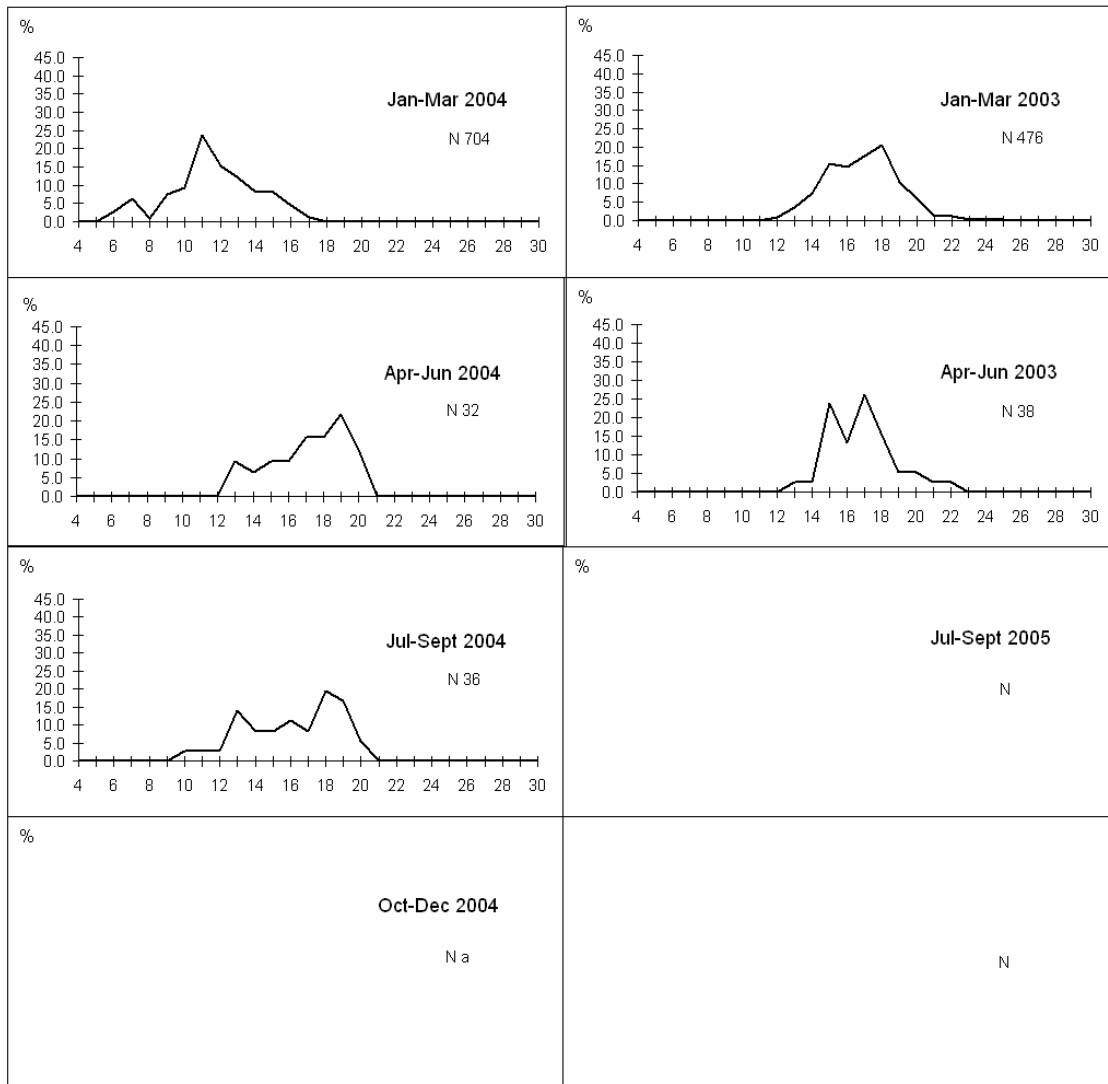


Fig. 4. Redfish in Div. 3M: length distributions of redfish caught in a shrimp trawl after passing through a 22 mm sorting grate in 2004-2005.

Greenland halibut

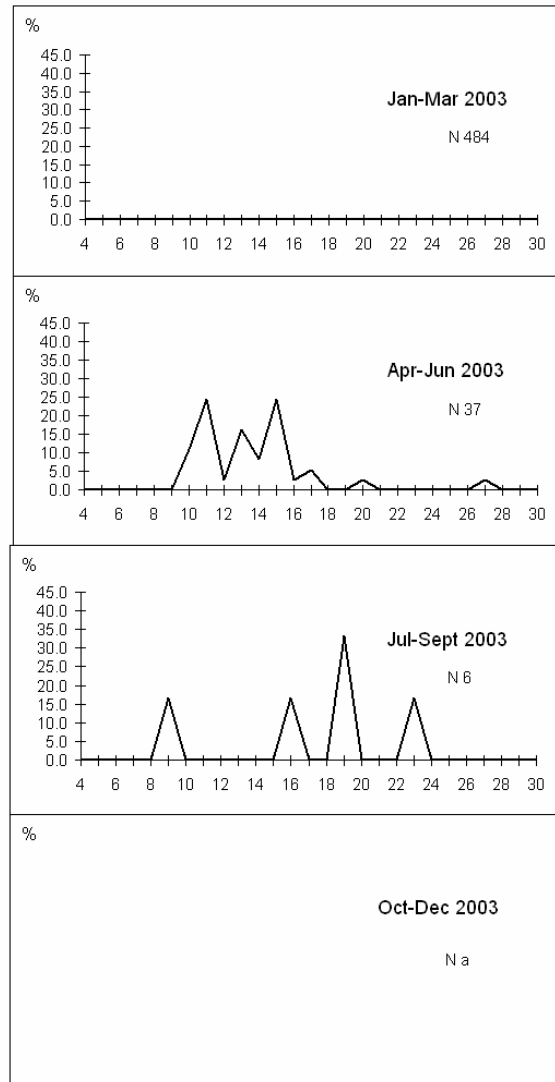


Fig. 5. Redfish in Div. 3M: length distributions of redfish caught in a shrimp trawl after passing through a 22 mm sorting grate in 2003.

Greenland halibut

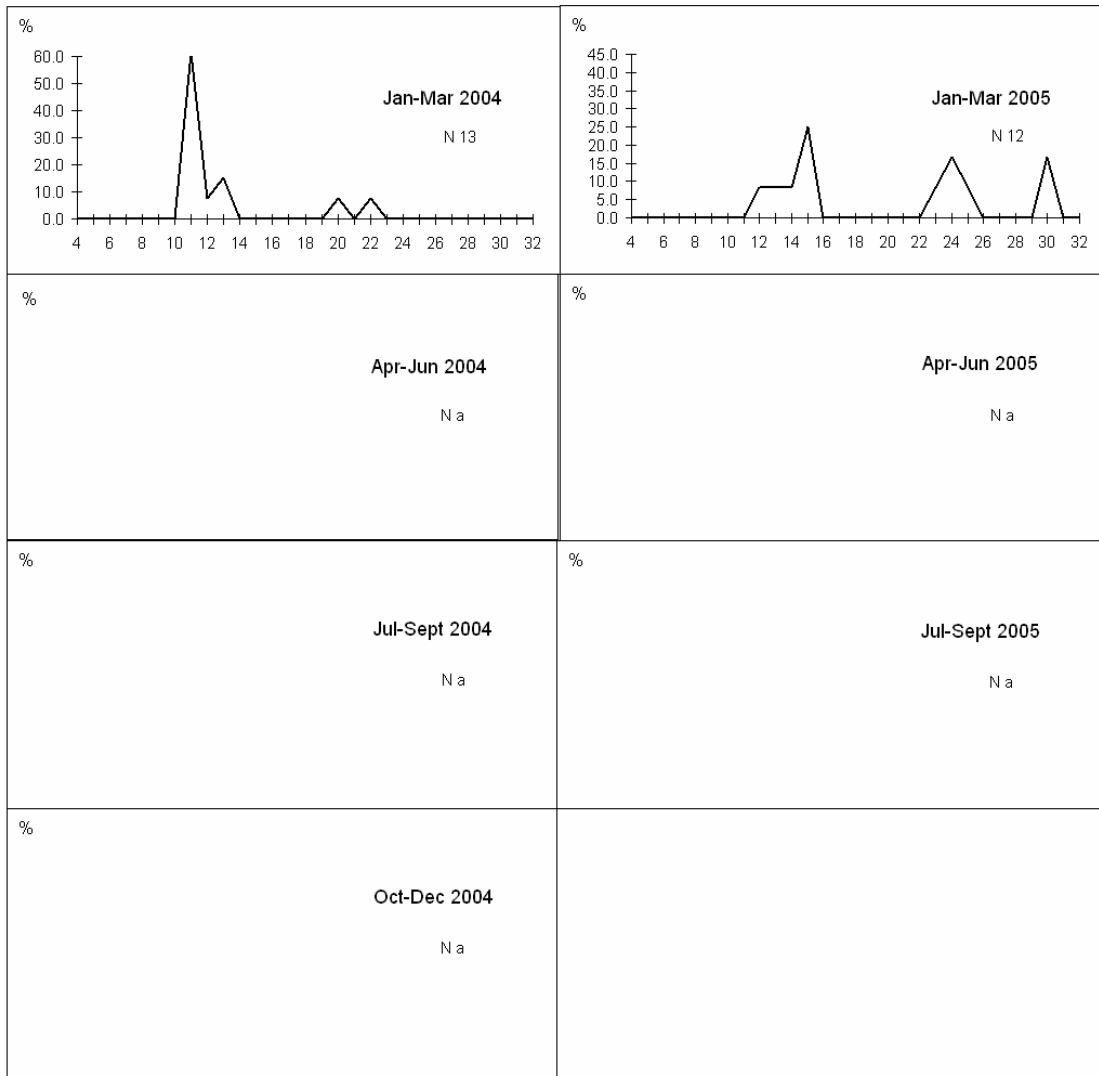


Fig. 6. Greenland halibut by-catch in Div. 3M: length distributions of Greenland halibut caught in a shrimp trawl after passing through a 22 mm sorting grate in 2004-2005.