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Results from Bottom Trawl Survey on Flemish Cap of June-July 2010

by

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Abstract

A stratified random bottom trawl survey on Flemish Cap was carried out from June 21st to July 22nd 2010. The area surveyed was extended up to depths of 800 fathoms (1400 meters) following the same procedures as in previous years and decreasing the number of hauls planned (158). The survey was carried out by the *R/V Vizconde de Eza* with the usual survey gear (*Lofoten*). A total of 153 valid hauls were made by the vessel *R/V Vizconde de Eza*, 97 up to 730 meters depth and 56 up to 1400 meters. Survey results including abundance indices of the main commercial species and age distributions for cod, redfish, American plaice, Greenland halibut and Shrimp are presented. The general indexes for this year are estimated taken into account the traditional swept area (strata 1-19, up to depths of 730 m.) and the total area surveyed (strata 1-34, up to depths of 1400 m.).

Introduction

The survey on Flemish Cap was carried out on board *R/V Vizconde de Eza* in 2010. A total of 153 valid bottom trawls were made up to a depth of 1400 m (800 fathoms) (Fig. 1). The survey covered all strata of the bank adequately with the exception of the strata corresponding with the Beothuk knoll (35-39 strata) in the southwest of the bank and the strata 26 and 27 in the southeast. A synoptic sheet of the survey with vessel and gear characteristics is shown in Table 1. This was the 21st survey of the series initiated by the EU in 1988. All surveys had a stratified random design following NAFO specifications (Doubleday, 1981). Dates of the previous surveys were:

Year	Vessel	Valid tows	Dates	Year	Vessel	Valid tows	Dates
1988	<i>Cornide de Saavedra</i>	115	8/7 – 22/7	2000	<i>Cornide de Saavedra</i>	120	10/7 – 28/7
1989	<i>Cryos</i>	116	12/7 – 1/8	2001	<i>Cornide de Saavedra</i>	120	3/7 – 20/7
1990	<i>Ignat Pavlyuchenkov</i>	113	18/7 – 6/8	2002	<i>Cornide de Saavedra</i>	120	30/6 – 17/7
1991	<i>Cornide de Saavedra</i>	117	24/6 – 11/7	2003	<i>Vizconde de Eza</i>	177 (114)	2/6 – 2/7
1992	<i>Cornide de Saavedra</i>	117	29/6 – 18/7		<i>Cornide de Saavedra</i>	50**	7/6 – 17/6
1993	<i>Cornide de Saavedra</i>	101	23/6 – 8/7	2004	<i>Vizconde de Eza</i>	177 (124)	25/6 – 2/8
1994	<i>Cornide de Saavedra</i>	116	6/7 – 23/7		<i>Cornide de Saavedra</i>	61**	23/7 – 2/8
1995	<i>Cornide de Saavedra</i>	121	2/7 – 19/7	2005	<i>Vizconde de Eza</i>	176 (117)	1/7 – 21/8
1996	<i>Cornide de Saavedra</i>	117	28/6 – 14/7	2006	<i>Vizconde de Eza</i>	179 (115)	1/7-26/7
1997	<i>Cornide de Saavedra</i>	117	16/7 – 1/8	2007	<i>Vizconde de Eza</i>	174 (117)	23/6-19/7
1998	<i>Cornide de Saavedra</i>	119	17/7 – 2/8	2008	<i>Vizconde de Eza</i>	179 (111)	23/6-19/7
1999	<i>Cornide de Saavedra</i>	117	2/7 – 20/7	2009	<i>Vizconde de Eza</i>	178 (119)	23/6-20/7
				2010	<i>Vizconde de Eza</i>	153 (97)	22/6-21/7

() valid tows carried out in depths lesser than 400 fathoms

** calibration tows

Material and Methods

As last year, the *R/V Vizconde de Eza* carried out the survey following the same procedures as in previous years, the same bottom trawl net *Lofoten*, with a cod-end mesh size of 35 mm, as well as all other details of its use (Saborido-Rey and Vazquez, 2003).

Results

Following the agreement of the NAFO Standing Committee on Fisheries Science (STACFIS), on preferring mean number or weight per tow over other survey indices, most tables in the report are presented in that way. Details on changes were presented in a previous report (Saborido-Rey and Vazquez, 2003).

Mean catch per tow (Kg) of main species in past surveys are:

	Survey	Cod	American plaice	Redfish	Greenland halibut	Roughhead grenadier	Shrimp
120-720 m	1988	50.78	19.95	234.19	8.61	2.50	7.14
	1989	141.82	17.47	202.11	5.56	1.08	2.86
	1990	73.82	14.90	157.62	7.21	1.06	4.34
	1991	50.05	12.54	95.69	10.16	1.66	14.50
	1992	33.22	10.76	161.91	10.85	1.96	31.28
	1993	75.81	9.78	90.29	8.12	3.76	15.03
	1994	32.91	10.23	202.10	9.99	2.46	4.95
	1995	12.06	8.44	108.98	13.52	1.94	9.33
	1996	11.21	5.10	148.80	14.42	1.69	13.56
	1997	12.39	3.76	206.19	20.02	1.49	9.58
	1998	6.20	4.27	88.08	30.13	2.10	52.19
	1999	3.55	3.21	122.67	26.37	1.55	32.00
	2000	3.81	2.00	221.33	21.09	1.30	24.52
	2001	3.35	2.99	96.18	17.25	2.59	35.21
	2002	3.10	2.55	150.85	15.05	1.51	49.96
	2003	1.98	2.84	116.66	7.73	2.92	26.75
	2004	5.06	4.38	311.62	15.28	4.47	25.03
	2005	6.52	3.43	563.34	14.55	2.97	38.14
	2006	15.55	2.10	953.66	14.56	4.89	18.71
	2007	29.70	1.31	577.76	16.22	1.70	21.20
2008	54.31	2.20	703.97	14.92	3.68	13.76	
2009	93.54	1.79	445.76	9.67	0.97	3.47	
2010	86.17	3.04	263.88	8.28	1.74	6.08	
120-1400 m	2004	3.32	2.88	204.71	23.42	14.03	16.49
	2005	4.28	2.25	370.06	17.57	11.64	25.47
	2006	10.21	1.38	626.40	19.89	9.89	12.46
	2007	19.51	0.86	379.51	25.91	6.38	13.98
	2008	35.67	1.44	462.44	32.35	9.91	9.10
	2009	61.44	1.18	292.82	29.44	5.96	2.31
	2010	56.60	2.00	173.38	22.13	7.43	4.00

These survey indices are also presented in Table 2, and even they belong to different species and pelagic vs. demersal character and the transformation to the new scale (since 2003 the *R/V Cornide de Saavedra* was substituted by the *R/V Vizconde de Eza*) only was carried out for the main species, a global index is presented for each year, which minimum occurred in 2001. Until 2003 redfish showed the highest annual variability probably due to its pelagic habitat, making accessibility to bottom gears more changeable than in the case of demersal or benthic species. However since 2004 the presence of some strong year classes mainly of *S. fasciatus* caused the increase of redfish and total biomass, reaching in 2006 the historic maximum. In the following years the redfish biomass has been decreasing and it is now at levels prior to 2003.

The relative high values estimated in 2004 for American plaice did not keep in following years and they were probably due to the occasional increases of catchability. Greenland halibut biomass maintained a continuous biomass increase to reach a maximum in 1998, since then the biomass decreased but maintained to a roughly same level, excluding the out of range 2003 value. Shrimp catches in 2005 were between the highest of the historical

series but this high level is not continued in the following years, especially in the last two years, where the shrimp biomass decreased at levels next to the historical minimums.

For cod, 1995 was the spawning year for the first extremely weak recruitment; it had been 1991 for American plaice. The high cod indexes at age 1 since 2005 up to date as well the corresponding indices from age 2 to age 6 in the following years, indicate the presence of relative and consecutive strong year classes in the last years 2004-2009.

Cod

Mean catch per standard tow by strata and its standard error are presented in Table 3. These indices are compared with results of previous surveys in Table 5. Total biomass calculated by the swept area method and compared with Russian survey results are:

Year	EU (1)	Russia: (2)	(3)	Year	EU (1)	Russia: (2)	(3)
1983		23,070		1997	9,966	-	-
1984		31,210		1998	4,986	-	-
1985		28,070		1999	2,854	-	-
1986		26,060		2000	3,062		-
1987		10,150	21,600	2001	2,695	784	-
1988	40,839	7,720	34,200	2002	2,496	694	-
1989	114,050	36,520	78,300	2003	1,593		-
1990	59,362	3,920	15,200	2004	4,071		
1991	40,248	6,740	8,200	2005	5,242		
1992	26,719	2,490	2,400	2006	12,505		
1993	60,963	8,990	9,700	2007	23,866		
1994	26,463	-	-	2008	43,675		
1995	9,695	8,260	-	2009	75,228		
1996	9,013	730	-	2010	69,295		tons

1) Biomass estimated from bottom trawl survey. 2) Biomass estimated from bottom trawl survey (Kiseleva and Vaskov 1994; Kiseleva 1996, 1997; Vaskov and Igashov, 2003). 3) Biomass estimated of bottom trawlable plus pelagic biomass (Borovkov *et al.* 1993; Kiseleva and Vaskov 1994).

The mean frequency at age per tow in Flemish Cap surveys series is shown in the table below.

age	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
1	6.05	24.38	2.86	160.45	88.95	5.07	3.75	1.77	0.04	0.05	0.03	0.01	0.22	0.59		0.85		10.03	24.51	4.86	7.58	6.38	82.69
2	99.36	13.43	15.35	32.60	52.13	172.05	5.14	14.80	3.88	0.19	0.10	0.10	0.02	2.47	1.65	0.07	4.20	0.02	4.82	14.46	20.74	9.30	34.52
3	61.55	113.53	6.37	21.02	6.94	38.67	34.51	1.66	8.28	4.32	0.12	0.14	0.41	0.02	0.80	0.78	0.06	1.39	0.07	6.24	15.44	20.11	10.74
4	16.72	67.91	21.08	2.64	2.97	1.37	6.34	4.84	1.11	5.97	1.56	0.15	0.25	0.15	0.04	0.17	0.77	0.10	1.83	0.03	5.65	17.78	9.53
5	1.81	25.40	19.69	8.40	0.48	1.64	0.16	1.15	2.99	0.49	1.95	0.89	0.12	0.10	0.09	0.03	0.21	0.88	0.11	1.42	0.09	5.16	6.22
6	0.26	1.66	5.59	2.15	1.74	0.22	0.08	0.04	0.24	1.18	0.10	0.55	0.55	0.02	0.04	0.05	0.01	0.17	0.73	0.07	1.15	0.02	2.24
7	0.28	0.18	0.42	0.37	0.30	0.61	0.01	0.03	0.01	0.03	0.18	0.02	0.21	0.18	0.03	0.01	0.01		0.15	0.53	0.07	1.36	0.01
8	0.09	0.16	0.18	0.08	0.02	0.11	0.14		0.01			0.01	0.01	0.12	0.12	0.01	0.00	0.02	0.01	0.09	0.29		0.57
9		0.01	0.10	0.04				0.03		0.01		0.02	0.01	0.04	0.05	0.01	0.01			0.02	0.10	0.42	0.06
10		0.01	0.03	0.00			0.01	0.01						0.01		0.03	0.02	0.01	0.01	0.02			0.32
11			0.01	0.01										0.01	0.01					0.01	0.02		0.04
12									0.00				0.01										
13																			0.01				
14													0.01										
total	186.13	246.66	71.67	227.78	153.53	219.72	50.14	24.33	16.56	12.23	4.05	1.87	1.83	3.67	2.81	2.04	5.17	12.63	32.28	27.74	51.14	60.53	146.96

The 1990 year-class was the most abundant observed at age 1, but its level was not maintained in the following years, after recruitment. This may indicate that its abundance was overestimated in the 1991 survey. The abundance of the 1991 year-class, although recording a maximum at age 2, decreased quickly as a consequence of the intense fishery on ages 2 and 3 during 1993 and 1994. The 1992 to 1994 year-classes were weak, and those from 1992 to 2003 failed almost completely. The abundances of 2004-2009 year classes are higher than in previous 12 years. The abundance of the 2009 year-class is between the three highest recorded in the series.

Tables 6, 7 and 4 show mean length frequency per tow, the age-length key and mean frequency at age per tow and stratum respectively. Spatial distribution on survey catches is presented in Figure 2. The figure 3 shows the mean catch with their standard error and mean numbers per standard tow by year. The figure 4 shows the age distribution by year in the EU Flemish Cap surveys.

American plaice

Mean catch per standard tow by strata is presented in Table 8. These indices are compared with results of previous surveys in Table 10. Total biomass calculated by the swept area method and compared with Russian survey results is shown in the following table:

Year	EU	Russia (1)	Year	EU	Russia (1)	Year	EU	Russia (1)
1983		8,900	1993	7,861	2,700	2003	2,286	1,398
1984		7,500	1994	8,227		2004	3,525	
1985		7,800	1995	6,785		2005	2,760	
1986		20,200	1996	4,098		2006	1,691	
1987		9,300	1997	3,026		2007	1,053	
1988	16,046	6,500	1998	3,437		2008	1,766	
1989	14,047	5,000	1999	2,585		2009	1,442	
1990	11,983	1,200	2000	1,606		2010	2,446	tons
1991	10,087	14,400	2001	2,404				
1992	8,656	1,200 tons	2002	2,049	548 tons			

1) Rikhter *et al.* 1991; Borovkov *et al.* 1992, 1993, 1994; Vaskov and Igashov, 2003.

The mean frequency at age per tow is presented in the following table. The 1986 and 1990 year-classes, ages >16 in 2008, were between the most abundant cohorts in the period, but no good recruitment was observed since then. Fish aged 6 or more roughly correspond with fishable biomass. The abundance of this group (f 6+) decreased along the period except in 1992, when an increase was recorded as the consequence of the income of the abundant 1986 year-class. During the last years fluctuated in low levels without trends.

Age	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
1		0.05	0.01	0.05					0.01	0.01		0.01	0.02			0.01			0.01	0.26	0.06	0.03	0.02
2	0.5	0.7	0.53	0.44	1.06	0.01	0.05	0.04	0.04	0.02	0.03		0.03	0.05		0.01	0.14	0.04	0.03	0.01	1.86	0.36	0.42
3	2.34	10.4	1.14	1.5	0.99	1.92	0.06	0.14	0.15	0.14	0.04	0.03	0.01	0.06	0.04	0.04	0.35	0.14	0.05	0.02	0.09	1.38	0.75
4	1.63	2.33	10.41	2.7	1.33	1.35	2.65	0.92	0.32	0.03	0.06	0.08	0.1	0.07	0.08	0.12	0.09	0.36	0.13	0.04		0.18	2.49
5	5.26	5.43	1.4	6.65	2.41	0.97	1.29	2.65	0.73	0.15	0.09	0.1	0.13	0.13	0.02	0.1	0.1	0.13	0.17	0.13	0.04	0.04	0.37
6	7.94	5.42	4.19	3.04	5.93	0.52	1.09	1.7	2.07	0.52	0.33	0.1	0.19	0.07	0.11	0.07	0.13	0.13	0.17	0.15	0.16	0.03	0.23
7	6.23	5.15	2.91	3.34	1.59	5.14	1.21	1.71	1.11	1.5	0.77	0.3	0.15	0.14	0.08	0.06	0.13	0.16	0.09	0.06	0.15	0.10	0.09
8	6.79	3.02	2.77	2.57	1.87	0.56	4.26	1.13	0.68	0.34	1.12	0.59	0.19	0.33	0.16	0.17	0.16	0.13	0.07	0.06	0.13	0.07	0.17
9	2.18	1	1.68	1.06	1.03	0.97	0.4	1.91	0.5	0.51	0.65	0.63	0.49	0.54	0.2	0.36	0.31	0.28	0.15	0.04	0.13	0.12	0.15
10	0.57	0.43	0.78	0.37	0.47	0.46	0.81	0.2	0.78	0.36	0.44	0.32	0.53	0.72	0.24	0.29	0.39	0.25	0.2	0.06	0.14	0.11	0.09
11	0.12	0.05	0.14	0.01	0.22	0.32	0.28	0.22	0.18	0.61	0.37	0.42	0.28	0.6	0.37	0.53	0.35	0.28	0.25	0.09	0.08	0.16	0.07
12	0.2	0.02	0.02	0.07	0.12	0.38	0.28	0.18	0.1	0.16	0.36	0.26	0.23	0.52	0.28	0.6	0.74	0.31	0.24	0.15	0.06	0.15	0.22
13	0.16		0.04		0.02	0.45	0.31	0.18	0.1	0.03	0.11	0.15	0.09	0.24	0.31	0.35	0.53	0.44	0.24	0.18	0.15	0.08	0.16
14	0.06		0.02			1.33	0.65	0.36	0.13	0.12	0.14	0.15	0.07	0.2	0.18	0.33	0.5	0.49	0.26	0.1	0.14	0.13	0.14
15	0.07					0.04	0.61	0.27	0.09	0.06	0.07	0.07	0.06	0.14	0.16	0.18	0.41	0.32	0.25	0.09	0.19	0.15	0.17
16+	0.05					0.05	0.01	0.04	0.03	0.14	0.13	0.12	0.07	0.12	0.23	0.2	0.65	0.68	0.4	0.29	0.7	0.44	0.62
Total	34.09	34.01	26.05	21.79	17.05	14.47	13.96	11.66	7.02	4.69	4.73	3.32	2.65	3.94	2.45	3.44	4.99	4.14	2.72	1.74	4.06	3.35	6.17
freq. 6+	24.37	15.09	12.55	10.46	11.25	10.22	9.91	7.9	5.77	4.35	4.49	3.11	2.35	3.62	2.32	3.14	4.3	3.47	2.33	1.28	2.01	1.54	2.10

Global indices of the table, such as total number by tow and frequency 6+, have declined over the whole period, reaching their lowest level in 2007: more than 10 times lower than in 1988-1990. Data in the table above indicates two periods for recruitment, and a change from an upper abundance level to a lower one. The 1991 year-

class was the first weak cohort. The relative high values founded in 2004 and 2005 for American plaice, mainly in the ages older than 13 years old, are probably due to the relative strong year classes previous to 1991.

Tables 11, 12 and 9 show mean length frequency per tow, the age-length key by sex and mean frequency at age per tow and stratum respectively. Catch per haul distribution is presented in Figure 5. The figure 6 shows the mean catch with their standard error and mean numbers per standard tow by year. The figure 7 shows the age distribution by year in the EU Flemish Cap surveys.

Redfish

All redfish catches were classified by species. The group name *juvenile* contains those individuals of small size for which routine classification was not possible. The 15 cm maximum length is a good reference for this group, but it was never used as a criterion. The skill required to identify the species increased over time, so the group *juvenile* is not a uniform defined group, but it is maintained for practical reasons.

Mean catch per standard tow by strata are presented in Tables 13, 15, 17 and 21 for *Sebastes marinus*, *S. mentella*, *S. fasciatus* and the *juvenile* group respectively. The following table shows the total biomass (tons) by year.

Year	<i>Sebastes</i>	<i>Sebastes spp.</i>			Total
	<i>marinus</i>	<i>mentella</i>	<i>fasciatus</i>	juveniles	
1988	18,229		170,102		188,331
1989	27,312		135,223		162,535
1990	16,751		86,695	23,311	126,757
1991	4,864	59,552	6,755	5,784	76,955
1992	4,909	85,408	6,314	33,578	130,209
1993	4,789	21,235	5,175	41,409	72,608
1994	39,516	42,495	9,303	71,211	162,525
1995	10,754	70,567	5,986	337	87,644
1996	13,431	92,647	13,112	472	119,662
1997	77,125	66,710	20,780	1,201	165,816
1998	7,640	53,946	7,656	1,590	70,832
1999	11,215	77,610	9,460	366	98,651
2000	53,388	106,283	15,364	2,955	177,990
2001	10,244	45,931	13,715	7,455	77,345
2002	11,651	48,760	27,556	33,345	121,312
2003	40,110	28,785	15,031	9,890	93,816
2004	85,383	45,999	76,164	43,059	250,605
2005	147,688	105,110	123,326	75,762	451,215
2006	298,290	105,849	319,387	43,396	766,922
2007	88,071	51,191	261,790	63,576	464,628
2008	240,777	42,570	202,288	80,491	566,126
2009	72,211	111,787	171,676	2,804	358,479
2010	47,377	62,684	97,067	5,083	212,211

Tables 14, 16, 18 and 20 show mean length frequency by tow for the four groups. Catches per haul distributions of the three species are presented in Figures 8, 9 and 10. The comparison of the biomass of the different species of *Sebastes* is shown in Figure 11.

Greenland halibut

Mean catch per tow by strata and its standard error are presented in Table 21. These indices are compared with results of previous surveys in Table 25. The following table summarises the total biomass in tons by year in depths <400 fth (1988-2010 years) and in depths up to 800 fth. (2004-2010 years)

Year	EU < 400 fth.	Year	EU < 400 fth	EU < 800 fth.
1988	6,926	2000	16,959	
1989	4,472	2001	13,872	
1990	5,799	2002	12,100	
1991	8,169	2003	6,214	
1992	8,728	2004	12,292	28,676
1993	6,529	2005	11,698	20,460
1994	8,037	2006	11,706	23,475
1995	10,875	2007	13,040	30,731
1996	11,594	2008	11,995	39,614
1997	16,098	2009	7,775	36,047
1998	24,229	2010	6,656	27,096
1999	21,207			

Mean length frequency by tow, age-length keys and mean frequency at age per tow are presented in Tables 22a,b, 24 and 23, respectively. Catch per haul distribution is presented in Figure 12. The figure 13 shows the mean catch with their standard error and mean numbers per standard tow by year. The figure 14 shows the age distribution by year in the EU Flemish Cap surveys.

Mean frequency at age per tow in the historical series was calculated to be as follows:

Mean frequency at age per tow until 400 fth.

Age	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
1	1.62	2.09	1.77	1.78	12.4	5.84	3.33	2.74	1.06	3.75	8.03	4.08	2.2	2.19	0.54	0.68	0.37	0.2	0.08	0.05
2	0.26	1.57	1.55	1.24	2.54	7.97	3.78	2.13	0.7	0.29	1.43	2.94	1	3.29	0.81	0.39	0.08	0.1	0.01	0.01
3	0.43	0.56	0.97	1.7	2.23	2.41	6	7.68	3.01	0.6	1.81	2.79	0.61	4.37	3.18	0.65	0.57	0.15	0.04	0.04
4	1.31	1.27	0.86	1.78	1.91	3.04	6.5	11	10.5	2.16	0.99	1.67	1.51	1.97	2.5	1.18	0.34	0.19	0.10	0.06
5	2.87	2.3	1.27	1.92	2.66	4.2	7.11	12.3	13.4	7.09	2.79	3.79	2.48	6.96	6.89	5.97	3.44	1.5	0.75	1.11
6	1.6	2.8	1.92	2.97	5.1	5.82	8.46	11.3	12.6	14.1	7.79	5.59	2.94	7.8	7.59	7.46	7.37	5.7	3.61	3.07
7	2.75	2.42	2.02	2.66	3.77	2.49	4.99	7.84	5.55	5.4	6.63	5.73	1.93	2.54	2.92	3.31	5.76	6.16	4.05	2.94
8	0.66	1.31	1.57	1.47	2.12	1.62	2.15	2.62	1.82	2.32	3.21	1.28	0.47	0.64	0.61	0.77	1.51	1.13	0.89	0.89
9	0.57	0.58	0.96	0.78	1.31	0.42	0.66	0.75	0.35	0.45	0.18	0.13	0.13	0.29	0.11	0.22	0.31	0.35	0.19	0.32
10	0.44	0.34	0.26	0.27	0.26	0.09	0.22	0.2	0.1	0.11	0.04	0.06	0.1	0.13	0.12	0.18	0.21	0.26	0.27	0.17
11	0.18	0.17	0.13	0.11	0.07	0.03	0.03	0.03	0.01	0.05	0.01	0.02	0.02	0.08	0.06	0.13	0.08	0.12	0.08	0.06
12	0.01	0.08	0.05	0.06	0.02	0.04	0.02	0.01	0			0.01	0	0.05	0.02	0.06	0.05	0.05	0.06	0.03
13		0.03	0.03	0.02			0.02	0.02	0					0.01	0	0.01	0.01	0.02	0.04	0.01
14		0.01	0.01		0.01	0			0.01					0	0		0	0.01	0.01	0.00
15	0.02					0.01	0.01							0	0			0	0.00	
16+	0.01						0.01							0	0			0	0.00	
total	12.7	15.5	13.4	16.8	34.4	34	43.3	58.6	49.1	36.3	32.9	28.1	13.4	30.3	25.3	21	20.1	16	10.17	8.76
10+	0.66	0.64	0.48	0.47	0.35	0.16	0.31	0.26	0.12	0.17	0.05	0.09	0.12	0.28	0.21	0.37	0.34	0.48	0.46	0.27

Mean frequency at age per tow until 800 fth.

Age	2004	2005	2006	2007	2008	2009	2010
1	1.40	0.36	0.45	0.25	0.13	0.05	0.03
2	2.20	0.54	0.25	0.05	0.07	0.01	0.01
3	2.92	2.09	0.44	0.39	0.10	0.03	0.02
4	1.55	1.72	0.91	0.29	0.16	0.08	0.11
5	6.85	5.29	5.84	3.84	2.03	1.13	2.00
6	9.14	6.79	8.56	9.09	9.00	6.80	6.01
7	4.97	3.42	4.68	8.56	12.53	11.43	7.83
8	1.48	0.98	1.39	2.88	3.18	3.54	2.50
9	0.74	0.26	0.42	0.72	1.14	0.93	0.98
10	0.37	0.41	0.36	0.59	0.87	1.03	0.83
11	0.26	0.23	0.30	0.30	0.44	0.36	0.31
12	0.16	0.13	0.15	0.17	0.25	0.28	0.17
13	0.14	0.06	0.05	0.06	0.13	0.25	0.12
14	0.05	0.04	0.03	0.05	0.10	0.14	0.09
15	0.07	0.01	0.01	0.01	0.07	0.04	0.05
16+	0.05	0.01	0.01	0.01	0.06	0.06	0.04
total	32.34	22.33	23.85	27.28	30.24	26.16	21.12
freq. 10+	1.10	0.88	0.90	1.19	1.90	2.16	1.63

In order to compare with XSA results, the tables 26a,b and 27a,b also show the abundance and biomass by age, corresponding at age greater or equal than five years at depths < 400 fth. (a) and < 800 fth (b).

Shrimp

Casas J.M. (2010) presented detailed results.

Roughhead grenadier (*Macrourus berglax*)

Mean catch per standard tow by strata and its standard error are presented in Table 28. These indices are compared with results of previous surveys in Table 32. The following table summarises the total biomass in tons by year:

Biomass (tons) and mean catch per tow along this survey series were:

Year	EU < 400 fth.	Year	EU < 400 fth	EU < 800 fth.
1988	2,009	2000	1,047	
1989	871	2001	2,079	
1990	852	2002	1,211	
1991	1,335	2003	2,348	
1992	1,577	2004	3,597	17,185
1993	3,021	2005	2,387	12,560
1994	1,975	2006	3,933	11,336
1995	1,558	2007	1,367	7,271
1996	1,362	2008	2,961	12,138
1997	1,197	2009	781	7,303
1998	1,691	2010	1,403	9,092
1999	1,250			

Mean length frequency by tow, age-length keys and mean frequency at age per tow are presented in Tables 29a,b, 30 and 31, respectively. Catch per haul distribution is presented in Figure 15. Figure 16 shows the mean catch with their standard error and mean numbers per standard tow by year. Figure 17 shows the age distribution by year in the EU Flemish Cap surveys.

Mean frequency at age per tow in the historical series was calculated as follows:

Mean frequency at age per tow until 400 fth.

Age	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
1			0.16		0.06	0.02	0	0.08	0.05	0.581	0.268	0.14	0.01	0.02	0.01	0	0.04
2	0.06	0.13	0.07	0.06	0.16	0.05	0.1	0.26	0.24	2.66	0.579	0.33	0.44	0.03	0.1	0.02	0.09
3	0.17	0.26	0.14	0.23	0.28	0.06	0.13	0.34	0.27	1.339	3.879	0.45	0.55	0.07	0.28	0.04	0.29
4	0.61	0.58	0.28	0.19	0.29	0.27	0.06	0.15	0.07	0.836	1.255	0.95	0.49	0.04	0.27	0.05	0.13
5	0.63	1.07	0.44	0.2	0.17	0.25	0.35	0.35	0.13	0.768	1.09	0.78	0.62	0.11	0.21	0.03	0.1
6	0.71	0.74	0.73	0.56	0.43	0.31	0.34	0.55	0.24	0.789	1.374	0.68	0.7	0.25	0.36	0.12	0.08
7	0.7		0.44	0.76	0.9	0.55	0.27	0.67	0.36	1.048	1.007	0.62	0.89	0.33	0.57	0.12	0.16
8	0.61	0.57	0.42	0.2	1.13	0.77	0.29	0.63	0.35	1.12	1.188	0.74	0.65	0.37	0.92	0.21	0.55
9	0.47	0.33	0.27	0.2	0.31	0.53	0.42	0.63	0.3	0.665	1.196	0.51	0.61	0.22	0.67	0.11	0.61
10	0.23	0.14	0.33	0.12	0.28	0.25	0.42	0.83	0.33	0.59	1.114	0.72	0.72	0.43	0.59	0.06	0.43
11	0.14	0.04	0.32	0.19	0.17	0.14	0.09	0.29	0.25	0.587	0.578	0.46	0.9	0.21	0.54	0.1	0.28
12	0.1	0.03	0.12	0.2	0.23	0.1	0.12	0.16	0.3	0.293	0.487	0.21	0.49	0.13	0.2	0.07	0.14
13	0.05	0.02	0.05	0.15	0.19	0.07	0.07	0.1	0.09	0.11	0.183	0.28	0.36	0.12	0.4	0.07	0.08
14	0.02	0.01	0.04	0.05	0.1	0.08	0.07	0.13	0.08	0.038	0.111	0.24	0.26	0.1	0.1	0.06	0.08
15	0.03	0.02	0.01	0.05	0.06	0.04	0.03	0.07	0.02	0.022	0.022	0.03	0.24	0.05	0.22	0.05	0.03
16+	0.01		0.01	0.02	0.04	0	0.04	0.1	0.08	0.091	0.074	0.04	0.27	0.09	0.14	0.12	0.02
total	4.54	4.58	3.81	3.19	4.8	3.46	2.81	5.33	3.17	11.54	14.41	7.17	8.2	2.57	5.57	1.23	3.11

Mean frequency at age per tow until 800 fth.

Age	2004	2005	2006	2007	2008	2009	2010
1	521	343	30		52	19	37
2	963	708	622		581	151	121
3	7205	1461	798		1049	320	622
4	3394	2333	1529		1273	408	602
5	2929	2443	1399		1269	260	769
6	3480	2676	2316		1578	954	1088
7	2905	2139	2351		1954	938	1046
8	3661	2401	1184		1932	1681	2398
9	3035	1408	1737		1649	868	1452
10	2595	1550	1643		1470	477	917
11	2121	1159	1409		1364	827	685
12	1568	675	739		657	566	559
13	768	1059	823		1170	563	465
14	480	1033	566		348	480	506
15	205	298	478		718	430	255
16+	1305	1113	1062		887	934	692
total	37135	22799	18684	8968	17952	9875	12214

References

- Borovkov, V., S. Kovalev, P. Savvatimsky, V.A. Rikhter and I.K. Sigaev – 1992. Russian research report for 1991. *NAFO SCS Doc.* 92/12.
- Borovkov, V., K. Gorchinsky, S. Kovalev, P. Savvatimsky, V.A. Rikhter and I.K. Sigaev – 1993. Russian research report for 1992. *NAFO SCS Doc.* 93/10.
- Borovkov, V., K. Gorchinsky, S. Kovalev and P. Savvatimsky – 1994. Russian national research report for 1993. *NAFO SCS Doc.* 94/3.
- Casas, J.M – 2010. Northern shrimp (*Pandalus borealis*) on Flemish Cap Survey 2010. *NAFO SCR Doc.* 08/66.
- Doubleday, W.G.- 1981. Manual of Groundfish Surveys in the Northwest Atlantic. *NAFO Sci. Counc. Stud.* 2, 55pp.
- Kiseleva, V.M.– 1996. Estimation of cod stock in Div. 3M by data of 1995 trawl survey. *NAFO SCR Doc.* 96/7.
- Kiseleva, V.M.– 1997. Assessment of cod stock on the Flemish Cap from data of trawl survey in 1996. *NAFO SCR Doc.* 97/7.
- Kiseleva, V.M. and A.A. Vaskov – 1994. Assessment of cod stock in NAFO Subarea 3 from 1993 trawl-acoustic survey data. *NAFO SCR Doc.* 94/12.
- Rikhter, V.A., I.K. Sigaev, V. Borovkov, S. Kovalev and P. Savvatimsky – 1991. USSR research report for 1990. *NAFO SCS Doc.* 91/5.
- Saborido-Rey, F. And A. Vázquez. 2003. Results from Bottom Trawl Survey on Flemish Cap of July 2002. *NAFO SCR Doc.*, N° 42. Serial No. 4860, 40p.
- Vaskov, A.A. and T.M. Igashov – 2003. Results from the Russian trawl survey on the Flemish Cap Bank (Division 3M) in 2002. *NAFO SCS Doc.* 03/9.

Table 1 – Technical data of the 2010 survey.

Procedure	Specification
Vessel	R/V Vizconde de Eza
GT	1 400 t
Power	1 800 HP
Mean trawling speed	3.5 knots
Trawling time	30 minutes effective time
Fishing gear	type Lofoten
footrope / handrope	31.20 / 17.70 m
footgear	27 steel bobbins of 35 cm
vertical opening	3.0 m (SCANMAR)
warps	100 meters, 45 mm, 200 Kg/100m
trawl doors	polyvalent, 850 Kg
wire length	2 × depth echo sounder (m.) + 250.
mesh size in cod-end	35 mm
Type of survey	Stratified sampling
Station selection procedure	Random
Criterion to change position of a selected tow	- Unsuitable bottom for trawling according to ecosounder register. - Information on gear damage from previous surveys.
Criterion to reject data from tow	- tears in cod-end - severe tears in the gear - less than 20 minutes tow - bad behaviour of the gear
Daily period for fishing	6.30 to 18:30 hours
Species for sampling	All fish, squid and shrimp
Species for age determination	Cod, American plaice, redfish (<i>Sebastes mentella</i>), Greenland halibut and Roughhead grenadier (<i>Macrourus berglax</i>).

Table 2 – Mean catch per tow (Kg) for several species or groups of species in 1988-2010 surveys in depths lesser than 400 fathoms.

Species	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Rajidae	5.59	2.41	3.51	5.05	4.7	7.76	4.36	2.82	2.55	2.29	2.46	2	1.43	2.78	1.92	5.73	7.76	5.27	4.36	2.71	7.82	2.79	4.32
<i>Synaphobranchus sp.</i>	0.27	0.11	0.05	0.1	0.09	0.13	0.01	0.02	0	0.01	0.05	0	0	0.03	0.01	0.03	0.11	0.09	0.04	0.08	0.05	0.03	0.02
<i>Urophycis sp.</i>	0.8	0.21	0.21	0.32	0.09	0.21	0.27	0.1	0.1	0.04	0.28	0.31	0.21	0.49	0.16	0.68	0.83	0.92	0.76	0.31	0.68	0.27	0.85
<i>Antimora sp.</i>	0.49	0.38	0.35	0.7	0.9	1.02	0.99	0.24	0.23	0.29	0.61	0.36	0.33	0.83	0.43	0.38	1.44	1.38	0.59	0.73	1.11	0.62	0.83
Macrouridae	3.84	1.81	1.52	2.8	3.22	8.08	4.02	3.24	2.91	2.85	3.52	2.9	2.25	3.83	2.54	4.59	6.11	4.17	6.25	2.94	4.92	1.45	2.40
<i>Notacanthus sp.</i>	0.62	0.51	0.08	0.59	0.56	0.92	0.57	0.43	0.22	0.36	0.21	0.08	0.12	0.13	0.08	0.03	0.18	0.08	0.18	0.08	0.11	0.04	0.03
<i>Illex sp.</i>	0.01	0.01	2.05	1.44	0.08	0	0.26	0	0.11	0.08	0.09	0.02	0	0.01	0.01	0.28	0.59	0.10	4.41	0.51	6.39	2.16	0.05
Anarhichadidae	9.94	9.31	10.1	12.56	11.31	17.85	19.45	23.9	25.57	17.45	13.66	6.94	5.56	7.29	6.5	7.44	13.17	11.90	11.53	10.19	12.27	5.72	5.29
Witch flounder	1.13	0.42	0.52	0.96	1.02	1.3	0.98	0.88	0.63	0.4	0.3	0.47	0.51	0.57	0.26	1.05	1.95	2.21	1.11	0.74	2.76	0.95	2.28
Greenland halibut	8.61	5.56	7.21	10.16	10.85	8.12	9.99	13.52	14.42	20.02	30.13	26.37	21.09	17.25	15.05	7.73	15.28	14.55	14.56	16.22	14.92	9.67	8.28
Zoarcidae	0.7	1.42	1.5	2.46	1.69	4.32	2.33	2.71	2.12	2.15	2.56	1.11	0.97	1.55	1.01	2.57	4.58	3.83	2.24	0.44	0.57	0.07	0.09
Cod	50.78	141.82	73.82	50.05	33.22	75.81	32.91	12.06	11.21	12.39	6.20	3.55	3.81	3.35	3.10	1.98	5.06	6.52	15.55	29.70	54.31	93.55	86.17
American plaice	19.95	17.47	14.90	12.54	10.76	9.78	10.23	8.44	5.10	3.76	4.27	3.21	2.00	2.99	2.55	2.84	4.38	3.43	2.10	1.31	2.20	1.79	3.04
Redfish	234.19	202.11	157.62	95.69	161.91	90.29	202.10	108.98	148.80	206.19	88.08	122.67	221.33	96.18	150.85	116.66	311.62	563.35	953.66	577.75	704.62	445.76	263.88
Shrimp*	7.14	2.86	4.34	14.50	31.28	15.03	4.95	9.33	13.56	9.58	52.19	32.00	24.52	35.21	49.96	26.75	25.03	38.14	20.19	21.20	13.76	3.48	6.08
Others	0.79	0.26	1.42	0.83	0.53	0	0.59	0.49	0.86	0.73	1.38	0.77	1.98	1.8	1.16	7.03	3.39	2.09	13.53	0.00	0.00	0.00	0.00
Total	344.07	386.41	277.78	209.92	271.69	240.61	293.42	186.67	227.52	277.86	204.61	202.00	284.12	172.49	234.43	178.74	398.10	658.04	1051.05	671.51	836.30	581.46	395.18

*) Values affected by mesh size cod-end: 40 mm in 1994, 25 mm in 1998 and 30 mm in 1999.

Table 3 – Cod (*Gadus morhua*) mean catch per standard tow by strata and its standard error in the 2010 survey.

stratum	area sq. miles	tow number	catch per tow (Kg)	
			mean	s. error
1	342	4	453.42	515.02
2	838	7	366	596.56
3	628	5	94.3	89.4
4	348	4	64.74	101.18
5	703	6	67.21	28.65
6	496	6	60.93	27.83
7	822	8	74.51	52.34
8	646	6	85.41	72.34
9	314	3	85.6	82.47
10	951	7	59	36.04
11	806	7	72.59	26.3
12	670	8	11.52	14.06
13	249	3	6.52	9.17
14	602	5	23.01	16.86
15	666	6	9.36	13.15
16	634	5		
17	216	2		
18	210	2		
19	414	3	2.78	4.81
total	10555	97	86.17	20.23

Table 4 – Cod (*Gadus morhua*) mean frequency at age per tow and stratum in the 2010 survey.

age	strata																total	mean	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	19		weight	length
1	7.06	32.3	12	4.2	17	9.59	0	0.11	0.01	0.1	0.2						82.7	73	20
2	15.9	9.91	1.8	4.3	1.1	0.58	0.2	0.37	0.01	0.2	0.1						34.5	390	35
3	2.06	6.45	1.1	0	0.4	0.17	0.1	0.37	0.01	0	0.1						10.7	946	47
4	1.9	5.06	0.8		0.4	0.16	0.2	0.73	0.02	0.1	0.2						9.53	2022	60
5	0.76	2.06	0.3		0.3	0.22	0.7	0.7	0.17	0.4	0.3	0.1	0.02	0.11	0.01	0.02	6.22	3805	75
6	0.1	0.36	0		0	0.09	0.3	0.06	0.17	0.4	0.3	0.1	0.01	0.16	0.06	0.01	2.24	6838	91
7																	0.01	6473	89
8	0.04	0.05	0		0	0.02	0.1	0.05	0.05	0.1	0.1	0		0.01	0.02		0.57		
9					0		0		0.01	0	0						0.06	9057	100
10	0.01	0.04	0		0	0.02	0	0.02	0.02	0.1	0.1						0.32		
11							0		0.01								0.04		
12	7.06	32.3	12	4.2	17	9.59	0	0.11	0.01	0.1	0.2						82.7	73	20
13	15.9	9.91	1.8	4.3	1.1	0.58	0.2	0.37	0.01	0.2	0.1						34.5	390	35
Set	4	9	7	3	7	6	9	6	2	9	9	2	1	4	4	1			
n	3.26	14.36	5.74	3.97	1.67	10.42	5.65	1.99	0.04	1.08	2.49	0.01	0.01	0.06	0.40	0.02	51.13	4235	42.5

Table 5 – Cod (*Gadus morhua*) mean catch per standard tow (Kg) by strata in 1988-2010 surveys.

stratum	depth in		year																						
	fathoms		1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
1	70-80		51.62	24.91	31.67	214.33	2.90	19.79	83.11	59.97	38.62	9.32	4.81	3.81	9.57	3.31	18.31	6.64	72.16	41.87	93.36	169.65	162.09	86.47	453.42
2	81-100		158.97	161.67	32.32	85.91	80.67	141.64	128.21	47.61	62.50	32.08	29.75	23.52	11.60	7.68	11.53	1.60	24.89	29.57	64.92	27.79	83.73	103.79	366
3	101-140		93.43	214.78	45.84	51.39	177.06	176.28	127.32	23.96	22.01	23.66	14.67	3.05	7.51	4.82	9.41	1.88	0.19	37.43	40.71	239.63	86.30	159.46	94.3
4	"		118.03	182.67	97.70	109.36	129.88	534.46	71.11	28.12	40.26	32.32	5.26	0.97	16.72	18.43	2.50	5.13	5.51	5.73	17.57	42.68	29.08	195.74	64.74
5	"		39.78	199.81	158.89	198.86	85.31	127.41	17.26	23.78	17.49	21.47	18.20	4.77	7.92	4.85	2.74	5.66	0.28	0.56	12.03	12.24	21.08	129.69	67.21
6	"		85.49	179.66	87.50	40.50	25.21	111.67	37.36	34.64	16.42	28.44	16.22	9.93	13.53	19.83	13.88	0.64	3.86	5.45	32.40	85.03	330.42	284.04	60.93
7	141-200		35.50	255.88	62.90	40.53	15.09	98.24	13.67	1.95	0.87	17.05	1.24	0.82	0.09	0.20	0.38	1.71	0.29		7.55	2.24	74.91	202.13	74.51
8	"		181.45	333.89	342.16	103.75	47.72	161.79	73.45	7.08	1.90	32.71	1.56	0.47	1.48	2.50	0.76	2.26	0.09		7.04	9.66	70.51	57.19	85.41
9	"		7.68	219.91	270.98	7.87	5.98	41.69	10.00	0.37	4.30	7.28		0.80	1.72		0.58	15.72			2.68	6.32	3.37	21.02	85.6
10	"		18.47	67.60	64.58	21.51	4.51	12.92	6.98	0.80	0.64	4.16	2.74	1.41	1.47	1.11	0.03	0.33		0.39	4.19	3.40	36.23	69.98	59
11	"		40.80	215.27	66.37	29.10	3.66	27.33	9.47	1.28	0.67	5.06	2.86	4.16	1.72	2.84	0.30	0.93	0.46	0.91	6.20	4.42	60.23	70.61	72.59
12	201-300		6.57	48.37	31.84	2.47		0.47										1.39					0.82	6.63	11.52
13	"		0.44	133.59	39.93	4.94																	0.81	7.11	6.52
14	"		2.33	24.43	14.00	2.85	1.46	4.81										0.00			1.66		3.50	213.55	23.01
15			14.74	166.25	46.32	2.13												0.35				0.93	15.87	3.85	9.36
16	301-400			1.35																					
17				0.31				0.14																	
18			0.13					0.18																	
19				3.19																					2.78
total			50.78	141.95	75.71	50.05	33.22	76.08	32.91	12.05	11.21	12.39	6.20	3.55	3.81	3.35	3.10	1.98	5.06	6.52	15.55	29.70	54.31	93.54	86.17
s.e.			7.19	15.18	10.23	8.34	7.26	21.63	9.16	2.57	1.81	2.14	0.80	0.56	0.74	0.47	0.49	0.34	0.97	2.02	2.44	11.25	13.7	20.17	20.23

s.e.: standard error

Table 6 – Cod (*Gadus morhua*) mean length frequency per tow in the 2010 survey.

length		length		length		length	
12-14	1.48	42-44	1.18	72-74	1.01	102- 104	0.15
15-17	21.57	45-47	3.07	75-77	0.77	105- 107	0.11
18-20	46.34	48-50	3.83	78-80	0.34	108-110	0.06
21-23	12.87	51-53	2.97	81-83	0.58	111-113	0.04
24-26	0.37	54-56	2.67	84-86	0.48	114-116	0.05
27-29	0.90	57-59	3.84	87-89	0.57	117-119	0.01
30-32	5.45	60-62	2.93	90-92	0.34	120-122	0.09
33-35	15.15	63-65	1.70	93-95	0.14		
36-38	11.12	66-68	1.48	96-98	0.15		

Table 7 – Cod (*Gadus morhua*) age-length key in 2010.

Length cm	Age																tot
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16+	
12-14	19																19
15-17	64																64
18-20	62																62
21-23	61																61
24-26	13	3															16
27-29	3	17														16	36
30-32		62															62
33-35		69															69
36-38		64															64
39-41		20	4													26	50
42-44		2	20													20	42
45-47			20													46	66
48-50			19	4												41	64
51-53			10	14												35	59
54-56			8	13												43	64
57-59			4	15	2											44	65
60-62			1	17	2											40	60
63-65				2	21											39	62
66-68				1	20											40	61
69-71					19	2										38	59
72-74					22	3										37	62
75-77					13	8										31	52
78-80					17	16	1									1	35
81-83					12	28	1									4	45
84-86					4	29	2									2	37
87-89						30	6			2						3	41
90-92						13	4										17
93-95						6	1	6		1							14
96-98						1	8	1	3							3	16
99-101						1	7	3	1							2	14
102-104							4	4	4								12
105-107							4	1	4	1							10
108-110							2		3								5
111-113									3	1							4
114-116									3								3
117-119									1								1
120-122																	
total:	222	237	86	66	132	137	1	45	6	27	3					511	1473

Table 8 – American plaice (*Hippoglossoides platessoides*) mean catch per standard tow by strata and its standard error in the 2010 survey.

stratum	area	tow	catch per tow (Kg)	
	sq. miles	number	mean	st. error
1	342	4	27.46	29.38
2	838	7	16.98	14.39
3	628	5	2.15	1.38
4	348	4	3.45	1.61
5	703	6	3.75	2.98
6	496	6	0.89	0.44
7	822	8	0.44	0.54
8	646	6	1.00	1.37
9	314	3		
10	951	7	1.59	2.03
11	806	7	0.42	0.46
12	670	8		
13	249	3		
14	602	5		
15	666	6		
16	634	5		
17	216	2		
18	210	2		
19	414	3		
total	10555	97	3.04	0.65

Table 9 – American plaice (*Hippoglossoides platessoides*) mean frequency at age per tow in the 2010 survey.

age	stratum											total	mean weight g	mean length cm
	1	2	3	4	5	6	7	8	9	10	11			
1			0.01							0.01		0.02	19	13
2	0.01	0.15	0.01		0.07	0.13	0.01		0.00	0.04	0.01	0.42	80	21
3	0.15	0.36	0.05	0.00	0.02	0.09	0.01	0.01	0.02	0.04	0.15	0.75	188	27
4	0.49	1.14	0.19	0.12	0.15	0.08	0.09	0.09	0.12	0.03	0.49	2.49	286	31
5	0.06	0.16	0.04	0.03	0.04	0.00	0.01	0.02	0.02	0.01	0.06	0.37	407	35
6	0.04	0.11	0.02	0.01	0.03			0.01	0.01		0.04	0.23	458	36
7	0.03	0.03	0.00	0.00	0.01			0.00	0.01	0.00	0.03	0.09	566	38
8	0.07	0.07	0.01	0.00	0.01	0.00		0.00	0.01		0.07	0.17	635	40
9	0.07	0.05		0.00	0.01	0.00		0.00	0.01	0.00	0.07	0.15	907	44
10	0.03	0.03	0.00	0.00	0.00			0.00	0.00	0.01	0.03	0.09	846	43
11	0.03	0.02	0.00	0.00	0.00			0.00	0.01		0.03	0.07	860	43
12	0.10	0.08	0.01	0.00	0.02	0.00		0.00	0.01	0.00	0.10	0.22	804	42
13	0.07	0.05	0.00	0.00	0.01	0.00			0.01		0.07	0.16	768	42
14	0.07	0.06	0.00		0.01			0.00	0.00		0.07	0.14	977	45
15	0.07	0.06	0.01	0.00	0.01			0.00	0.01		0.07	0.17	948	45
16+	0.23	0.27	0.00	0.02	0.06	0.00		0.01	0.02	0.00	0.23	0.62	1345	50

Table 10 – American plaice (*Hippoglossoides platessoides*) mean catch per standard tow (Kg) by strata in 1988-2010 surveys.

strata	Depth in	year																							
	fathoms	1988	1989	1990	1991	1992	1993	1984	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	
1	70- 80	50.1	38.4	19.4	41.4	27.2	41.4	25.4	85.6	56.1	14.6	5.99	14.3	13.2	40	5.41	49.6	52.6	39.8	27.4	10.9	5.54	21.04	27.46	
2	81-100	44.5	56.4	21.5	41.7	26.8	19.8	18.8	20.9	14.8	11.6	24.9	28.3	15.3	13.1	19.8	11.4	11.5	12.5	5.54	3.28	8.03	5.79	16.98	
3	101-140	28.6	23.4	34.9	26.1	13.2	9.27	6.8	5.27	3.52	10.3	5.95	2.04	0.44	1.93	1.55	0.36	8.9	2.11	1.54	2.12	3.08	1.56	2.15	
4	"	82.9	17.4	30.8	12.1	21	21.6	32.2	18.5	10.1	7.65	12.9	2.03	3.77	3.24	4.85		13.2	13.5	4.13	5.78	16.6	1.37	3.45	
5	"	48.5	57.7	34.2	26.3	15.6	24.1	23	10.3	9.32	11.6	13.9	1.37	1.05	2.08	3.55	1.53	1.27	0.84	1.17	1.51	1.64	1.33	3.75	
6	"	12.7	29.9	25.2	13.3	15.9	8.07	21.4	3.24	0.84	0.36	0.93	1.05	0.65	0.97	1.65	0.77	0.61	1.88	1.61	2.62	0.99	1.51	0.89	
7	141-200	18.7	8.47	13.4	6.21	10.2	5.09	5.04	3.97	1.15	1.32	0.75	0.29	0.23	0.45	0.84	0.48	1.24	0.49	0.59	0.32	0.76	0.51	0.44	
8	"	8.49	3.33	5.35	5.08	14.8	9.9	3.47	2.67	1.15	2.49	3.35	0.04		0.93	0.87	0.28	1.08	3.56	3.31	1.18	2.6	0.95	1.00	
9	"	4.29	6.83	14.3		15.6	8.57	0.81	20.9	2.31	1.48					0.05	0.38	2.99	0.75				3.22		
10	"	32.1	20.6	27.6	18.1	19.4	20.1	30.9	9.78	5.72	3.96	0.49	1	0.61	1.31	0.49	0.75	0.58	1.2	1.33	0.33	2.25	0.74	1.59	
11	"	19.3	19	21.4	6.53	6.07	4.75	4.93	1.79	1.09	0.52	0.48	0.61	0.36	0.44	0.95	0.47	1.03	0.57	0.32	0.35	0.82	1.03	0.42	
12	201-300	0.17	0.36	0.88	0.33	0.21	0.29	0.65	0.23	0.63	0.13				0.08		0.22							0.21	
13	"	0.11		1.08					0.13															0.00	
14	"	0.16	0.19	0.13	8.49	0.63	0.12	0.52	0.31	0.09		0.09	0.21											0.00	
15	"	0.44	1.95	0.05	1.91	0.75	2.16	0.79	1.35	0.44	0.13	0.13					0.12		0.08		0.05	0.14	0.02		
16	301-400	0.12			0.07	0.19	0.27	0.12																	
17	"																								
18	"																								
19	"				0.47	0.11	0.17	0.08	0.32																
total		20	17.5	14.9	12.6	10.8	9.79	10.2	8.44	5.09	3.76	4.27	3.21	2	2.99	2.55	2.86	4.38	3.43	2.1	1.31	2.2	1.79	3.04	
s.e.		2.29	2.55	1.59	1.47	1.19	1.29	1.71	1.35	1.13	0.88	0.93	1.08	0.41	0.53	0.91	0.93	0.92	0.85	0.43	0.2	0.37	0.41	0.65	

Table 11 – American plaice mean length frequency per tow in the 2010 survey.

length	male	female	length	male	female	length	male	female	length	male	female
12-13	0.013	0.000	28-29	0.618	0.134	44-45	0.096	0.000	12-13	0.013	0.000
14-15	0.012	0.000	30-31	0.531	0.190	46-47	0.049	0.050	14-15	0.012	0.000
16-17	0.000	0.000	32-33	0.442	0.378	48-49	0.095	0.000	16-17	0.000	0.000
18-19	0.055	0.012	34-35	0.149	0.429	50-51	0.188	0.000	18-19	0.055	0.012
20-21	0.136	0.074	36-37	0.112	0.266	52-53	0.171	0.000	20-21	0.136	0.074
22-23	0.066	0.080	38-39	0.162	0.110	54-55	0.072	0.000	22-23	0.066	0.080
24-25	0.162	0.058	40-41	0.315	0.029	56-57	0.121	0.000	24-25	0.162	0.058

Table 12 – American plaice (*Hippoglossoides platessoides*) age-length key in 2010.**MALE**

Length cm	age																total
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16+	
12-13	1																1
14-15	1																1
16-17																	
18-19		5															5
20-21		12															12
22-23		3	2														5
24-25		2	7	3													12
26-27			11	9													21
28-29			8	20													29
30-31			2	17	1												21
32-33			1	15	3	2	1										22
34-35				4	2	2				1							9
36-37				1	1			2			1	2			1		8
38-39								3	1			2	2			1	9
40-41						1	1	1	2	1	1	3	3	2	3	1	19
42-43								2	2	1	1	3	2	3	2	8	24
44-45							1		1			1				2	5
46-47													1	1	1	1	4
48-49																	
50-51	1																1
total	2	22	31	69	7	5	3	8	6	3	3	11	8	6	7	13	207

FEMALE

Length cm	age																total
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16+	
12-13																	
14-15																	
16-17																	
18-19		1															1
20-21		7															7
22-23		6	1														7
24-25		1	3	1													5
26-27			4	6													10
28-29			8	4													12
30-31			1	14	1												16
32-33			1	19	2												23
34-35				19	4	1											24
36-37				4	4	5	2	1									17
38-39				1	3	3		1									8
40-41					1					1							2
42-43																	
44-45																	
46-47									1		1		1		1		5
48-49								1	1			2	1	1		1	8
50-51									1	1				2	2	9	15
52-53									1	1	1			1	2	9	15
54-55																6	6
56-57												1				9	10
Total		15	18	68	15	9	2	3	4	3	2	3	2	4	5	34	191

Table 13 – Redfish (*Sebastes marinus*) mean catch per standard tow by strata and its standard error in the 2010 survey.

stratum	area sq. miles	tow number	catch per tow (Kg)	
			mean	st. error
1	342	4	2.02	1.76
2	838	7	1.99	1.63
3	628	5	57.6	52.86
4	348	4	97.29	85.76
5	703	6	54.44	79.99
6	496	6	157.87	122.72
7	822	8	194.49	326.54
8	646	6	50.27	50.14
9	314	3	377.22	295.11
10	951	7	60.16	44.22
11	806	7	76.71	64.84
12	670	8	0.44	1.05
13	249	3	1.2	2.09
14	602	5	3.59	2.76
15	666	6	0.38	0.93
16	634	5		
17	216	2		
18	210	2	0.04	0.06
19	414	3		
total	10555	97	58.91	11.32

Table 14 – Redfish (*Sebastes marinus*) mean length frequency per tow in the 2010 survey.

length	male	female	length	male	female
12	0.01		32	6.94	2.39
13	0.03	0.04	33	3.18	3.32
14	0.39	0.17	34	1.70	2.78
15	1.63	1.09	35	0.69	2.41
16	2.67	1.67	36	0.37	2.32
17	3.73	3.96	37	0.16	2.62
18	6.48	7.06	38	0.25	0.90
19	8.11	7.64	39	0.11	0.55
20	6.93	6.87	40	0.01	0.14
21	6.47	5.62	41		0.15
22	4.96	4.61	42		0.10
23	4.79	3.69	43		0.04
24	4.13	4.01	44		0.04
25	6.86	4.82	45		0.03
26	5.88	5.56	46		0.03
27	6.36	4.92	47		
28	5.16	3.82			
29	9.59	3.10			
30	5.24	2.92			
31	5.67	3.52			

Table 15 – Redfish (*Sebastes mentella*) mean catch per standard tow and its standard error by in the 2010 survey.

stratum	area sq. miles	tow number	catch per tow (Kg)	
			mean	st. error
1	342	4		
2	838	7	0.02	0.05
3	628	5	2.69	4.62
4	348	4	0.07	0.15
5	703	6	0.09	0.15
6	496	6	0.97	1.35
7	822	8	47.02	35.01
8	646	6	78.59	110.35
9	314	3	36.58	55.02
10	951	7	96.8	135.47
11	806	7	55.88	108.66
12	670	8	319.64	236.01
13	249	3	268.98	260.48
14	602	5	228.93	280.96
15	666	6	197.68	159.51
16	634	5	2.31	2.45
17	216	2	3.98	5.63
18	210	2	27.87	35.84
19	414	3	57.13	89.46
total	10555	97	77.95	12.04

Table 16 – Redfish (*Sebastes mentella*) mean length frequency per tow in the 2010 survey.

length	male	female	length	male	female	length	male	female
13	0.01	0.00	24	10.45	9.59	35	0.02	0.14
14	0.19	0.04	25	9.97	7.71	36	0.04	0.02
15	1.78	1.08	26	7.21	7.62	37		0.02
16	5.36	3.39	27	4.85	4.71	38	0.01	0.01
17	14.54	15.03	28	3.57	4.73	39	0.00	0.09
18	32.06	28.34	29	1.70	4.64	40		0.00
19	43.66	40.81	30	0.99	2.21	41		
20	41.30	34.87	31	0.48	1.07	42		
21	45.40	43.30	32	0.11	1.02	43		
22	38.82	35.73	33	0.14	0.21	44		
23	22.23	18.09	34	0.04	0.36	45		

Table 17 – Redfish (*Sebastes fasciatus*) mean catch per standard tow by strata in the 2010 survey.

stratum	area sq. miles	tow number	catch per tow (Kg)	
			mean	st. error
1	342	4		
2	838	7	0.06	0.15
3	628	5	25.7	53.72
4	348	4	2.21	2.48
5	703	6	4.74	9.11
6	496	6	40.99	53.68
7	822	8	161.35	164.26
8	646	6	114.09	105.3
9	314	3	576.6	1829.25
10	951	7	211.24	299.65
11	806	7	120.62	60.38
12	670	8	130.17	66.06
13	249	3	77.64	63.97
14	602	5	40.99	28.08
15	666	6	152.95	248.24
16	634	5	0.28	0.2
17	216	2	0.7	0.18
18	210	2		
19	414	3	1.16	1.73
total	10555	97	120.7	34.19

Table 18 – Redfish (*Sebastes fasciatus*) mean length frequency per tow in the 2010 survey.

length	male	female	length	male	female
13	0.01	0.00	29	2.49	69.51
14	0.19	0.04	30	1.74	45.76
15	1.78	1.08	31	0.37	14.67
16	5.36	3.39	32	0.00	8.33
17	14.54	15.03	33	0.37	14.18
18	32.06	28.34	34	0.12	2.98
19	43.66	40.81	35		0.25
20	41.30	34.87	36		0.12
21	45.40	43.30	37		0.25
22	38.82	35.73	38		0.12
23	22.23	18.09	39		0.37
24	10.45	9.59	40		
25	9.97	7.71	41		
26	7.21	7.62	42		
27	4.85	4.71			
28	3.57	4.73			

Table 19 – Juvenile redbfish (*Sebastes sp.*) mean catch per tow by strata and its standard error in the 2010 survey.

stratum	area sq. miles	tow number	catch per tow (Kg)	
			mean	st. error
1	342	4	0.25	0.45
2	838	7	1.32	0.99
3	628	5	7.65	14.84
4	348	4	14.89	26.9
5	703	6	2.25	2.33
6	496	6	13.76	9.45
7	822	8	14.94	16.98
8	646	6	12.17	14.17
9	314	3	31.1	41.24
10	951	7	8.67	9.29
11	806	7	10.36	12.18
12	670	8	0.28	0.53
13	249	3		
14	602	5	0.53	0.41
15	666	6	0.21	0.36
16	634	5		
17	216	2		
18	210	2		
19	414	3		
total	10555	97	6.32	1.21

Table 20– Juvenile redbfish (*Sebastes sp.*) mean length frequency per tow in the 2010 survey.

length		length	
5	0.01	13	41.51
6	0.04	14	29.12
7	0.61	15	21.43
8	4.33	16	5.33
9	13.33	17	0.62
10	18.96	18	0.11
11	38.24	19	
12	49.52	20	

Table 21 – Greenland halibut (*Reinhardtius hippoglossoides*) mean catch per standard tow by strata and its standard error in the 2010 survey.

stratum	Area sq. miles	tow number	catch per standard tow (Kg)	
			mean	st. error
1	342	4		
2	838	7		
3	628	5	0.13	0.3
4	348	4		
5	703	6		
6	496	6		
7	822	8	0.24	0.51
8	646	6	0.01	0.02
9	314	3		
10	951	7	0.26	0.68
11	806	7	0.52	1.38
12	670	8	14.56	13.18
13	249	3	14.4	9.25
14	602	5	1.35	1.05
15	666	6	24.12	15.32
16	634	5	43.03	14.16
17	216	2	27.11	23.12
18	210	2	32.86	22.18
19	414	3	39.02	28.19
20	525	5	37.26	14.18
21	517	5	34.69	22.51
22	533	4	59.36	40.2
23	284	2	33.07	18.28
24	253	3	23.89	16.91
25	226	3	27.49	15.3
28	530	5	49.38	26.84
29	488	6	56.25	41.01
30	1134	12	62.28	35.86
31	203	2	20.63	8.66
32	238	3	84.86	27.85
33	98	2	54.7	5.55
34	486	4	48.34	2.88
Total (1-19 strata)	10555	97	8.28	1.01
Total (1-34 strata)	16070	153	22.13	1.46

Table 22a – Greenland halibut (*Reinhardtius hippoglossoides*) mean length frequency per tow in the 2010 survey for depths < 400fth.

length	male	female	length	male	female	length	male	female
12-13		0.012	34-35	0.028	0.013	56-57	0.023	0.334
14-15	0.011		36-37	0.096	0.111	58-59	0.027	0.196
16-17		0.025	38-39	0.184	0.222	60-61		0.121
18-19			40-41	0.371	0.367	62-63		0.009
20-21	0.023		42-43	0.402	0.449	64-65		0.032
22-23			44-45	0.505	0.676	66-67		0.020
24-25	0.024		46-47	0.385	0.923	68-69		0.023
26-27			48-49	0.388	0.746			
28-29			50-51	0.154	0.421			
30-31	0.014	0.014	52-53	0.239	0.536			
32-33		0.014	54-55	0.205	0.419			

Table 22b. – Greenland halibut (*Reinhardtius hippoglossoides*) mean length frequency per tow in the 2010 survey for depths < 800fth.

length	male	female	length	male	female	length	male	female
12-13		0.011	38-39	0.553	0.446	64-65	0.009	0.228
14-15	0.010		40-41	1.093	0.902	66-67		0.276
16-17		0.025	42-43	1.132	1.307	68-69	0.011	0.104
18-19			44-45	1.636	1.908	70-71		0.111
20-21	0.024		46-47	1.599	2.390	72-73		0.114
22-23			48-49	1.751	2.225	74-75		0.032
24-25	0.024		50-51	1.375	2.073	76-77		0.030
26-27			52-53	1.333	2.135	78-79		0.030
28-29			54-55	0.578	1.684	80-81		0.030
30-31	0.046	0.014	56-57	0.301	1.437	82-83		
32-33	0.012	0.014	58-59	0.101	1.185	84-85		
34-35	0.122	0.085	60-61	0.046	0.690	90-91		0.012
36-37	0.298	0.196	62-63	0.012	0.385	92-93		0.012

Table23 – Greenland halibut (*Reinhardtius hippoglossoides*) mean frequency at age per tow and strata in the 2010 survey.

Age	strata																												total	mean weight pm(g)	mean length talla
	3	7	8	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	28	29	30	31	32	33	34					
1		0.27	0.18	0.17																								0.03	22	15	
2		0.06							0.10																				0.01	57	21
3		0.06		0.17		0.14			0.10																				0.02	87	23
4						0.08		0.02	0.10	0.58	0.12	0.13	0.16	0.15	0.25	0.91			0.12	0.10	0.08	0.17			0.55		0.05	0.11	318	35	
5	0.02	0.10				2.21	0.79	0.26	4.18	4.91	4.07	4.31	5.14	2.03	1.09	6.11	0.32	0.67	2.79	3.96	3.50	4.95	0.91	12.02	2.68	3.86	2.00	498	40		
6	0.19	0.19				5.29	3.58	0.57	9.26	14.35	10.57	13.06	17.06	8.23	6.40	16.28	3.74	4.51	6.85	14.04	12.56	13.80	4.59	24.76	11.12	14.31	6.01	694	44		
7	0.02	0.11		0.04		5.09	4.32	0.26	8.04	17.02	10.27	9.50	14.23	13.18	10.89	34.52	11.46	10.48	6.68	16.20	16.73	19.68	7.24	20.02	18.75	19.04	7.83	1017	50		
8				0.08		1.12	2.37	0.26	2.54	5.44	2.86	2.81	3.49	5.78	3.30	10.02	3.65	3.79	1.74	5.35	6.32	6.59	2.33	6.01	6.16	5.08	2.50	1339	55		
9				0.03		0.43	0.79	0.15	0.95	1.78	1.03	1.13	1.43	2.35	1.17	4.09	1.62	1.09	1.05	1.93	2.99	2.59	1.10	2.37	2.28	1.94	0.98	1460	56		
10					0.03	0.43	0.16	0.04	0.45	0.72	0.55	1.19	0.67	2.08	1.45	3.67	1.53	0.52	0.75	2.28	3.28	2.41	0.78	3.03	1.88	0.95	0.83	1868	61		
11					0.08	0.16	0.21	0.02	0.10	0.17	0.12	0.69	0.16	0.50	0.53	0.94	0.79	0.10	0.81	0.59	1.13	1.13	0.26	1.54	1.21	0.43	0.31	2102	63		
12					0.03	0.16	0.05			0.14		0.25		0.10	0.30	0.49	0.42		0.70	0.40	0.54	0.61	0.39	1.32	0.40	0.35	0.17	2530	66		
13					0.02	0.06	0.05			0.04		0.19		0.08	0.23	0.32	0.55		0.29	0.20	0.40	0.54	0.13	0.99	0.40	0.19	0.12	2809	69		
14						0.02						0.02				0.30	0.20	0.37	0.32		0.06	0.15	0.56	0.27	0.06	0.94	0.13		0.09	3405	73
15															0.10		0.23		0.29	0.20	0.08	0.28		0.55			0.05	3538	74		
16+														0.08	0.48		0.18		0.12		0.13	0.15		0.44	0.13		0.04	5157	83		

Table 24 - Greenland halibut (*Reinhardtius hippoglossoides*) age-length key in the 2010 survey.**MALE**

Length cm	age																total	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16+		
12-13																		
14-15	1																	1
16-17																		
18-19																		
20-21			1	1														2
22-23																		
24-25				2														2
26-27																		
28-29																		
30-31					1													1
32-33				1														1
34-35				1	7													8
36-37				2	16	2												20
38-39				3	23	5												31
40-41					12	17	3											33
42-43					8	20	3											32
44-45					2	30	3											35
46-47					1	18	14											34
48-49						9	22											32
50-51						2	30											32
52-53							25	11										36
54-55								11	15	4								30
56-57								6	7	4	1							18
58-59									4	2	1							7
60-61										3	1							4
62-63											1							1
64-65											1							1
66-67																		
68-69														1				1
total	1	1	3	8	69	103	117	37	13	5				1				358

Table 24 – (continued)

FEMALE

length cm	age																total	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16+		
12-13	1																7	
14-15																	5	
16-17	2																2	
18-19																		
20-21																		
22-23																		
24-25																	4	
26-27																	7	
28-29																	3	
30-31				1													3	
32-33					1												5	
34-35					4												10	
36-37					10	4											20	
38-39					14	12											30	
40-41					16	13											34	
42-43					8	19	2										35	
44-45					2	31	3										30	
46-47						19	14										31	
48-49						4	22	2	1								33	
50-51							29	3									38	
52-53							21	8	3								31	
54-55							9	17	6								33	
56-57							9	16	4	2							30	
58-59								11	11	7	2						31	
60-61									4	22	6						33	
62-63										18	3	3					28	
64-65										4	10	3	2				29	
66-67										2	6	6	4				13	
68-69											1	6	2	1			15	
70-71												1	3	3	5		19	
72-73												1	2	4			5	
74-75													1	1		1	5	
76-77														2		1	4	
78-79															2	1	3	
80-81														1	1	2		
82-83																	2	
84-85																		
86-87																		
90-91																	1	1
92-93																	1	1
total:	3			1	55	102	109	57	29	55	28	20	14	12	8	7	500	

Table 25 – Greenland halibut (*Reinhardtius hippoglossoides*) mean catch per standard tow (Kg) by strata in 1988-2010 surveys.

strata	depth in fathoms	year																						
		1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
1	70- 80															0	0.09							
2	81-100		0.04	0.1					1.89		0.04	0.09	0.05		0.24	0.16	0	0.22	0.11	0.14				
3	101-140	0.55	0.66	0.16	0.17	0.38	0.06		0.46	2.25	1.9	7.67	7.27	5.09	8.03	2.93	1.15	17.80	8.69	6.78	0.45		0.09	0.14
4	"	5.45	0.76		0.57	1.04	0.39		0.2	0.02	0.87	1.55	7.46	7.81	5.92	2.19	3.96	13.11	3.42	6.88	0.29			
5	"	1.39	1.81		0.53	0.77	0.01	0.03	0.4	0.67	1.82	3.22	7.65	5.72	5.01	1.24	1.72	4.73	5.22	4.32	1.71	0.27	0.14	
6	"	0.84	0.48	0.4	0.34	0.22	0.42		0.84	2.8	6.02	9.54	7.94	4.69	7.02	2.74	0.56	12.32	8.79	1.62	1.99	0.22		
7	141-200	1.36	1.01	0.92	3.01	3.92	1.5	3.42	14.44	18.3	22.7	41.6	37.6	25.1	15.7	6.85	6.61	16.48	9.52	12.43	11.64	8.37	0.18	0.25
8	"	3.07	4.51	1.25	3.65	7.7	2.84	0.92	6.77	7.28	21.6	20.1	40.5	26.7	22.8	17.83	10.3	16.48	18.97	18.49	8.78	4.60	0.63	0.00
9	"	7.53	6.86	2.21	3.17	13.5	1.29	1.8	7.45	6.66	10.6	19.7	14.8	10.2	14.8	5.8	5.85	19.40	3.81	23.01	20.34	16.78	1.30	0.00
10	"	1.48	1.14	0.8	2.37	4.99	0.44	3.23	7.25	9.89	11.9	18.9	21.1	22.1	24.1	10.26	3.95	10.40	14.61	11.74	7.72	10.73	0.35	0.26
11	"	0.73	0.99	0.37	1.72	3.72	3.81	3.84	8.01	10.9	10.2	20	21.5	17.7	16.6	5.52	4.51	10.28	17.31	4.72	8.20	9.17	0.35	0.53
12	201-300	7.94	12.7	5.64	14.9	12.1	18.3	23.9	22.46	41.6	44	60.3	71.7	42.6	31	21.27	13.2	17.67	19.99	19.15	24.41	27.29	23.84	14.56
13	"	3.38	6.51	11.5	2.29	1.26	7.53	8.06	6.7	15.7	25.5	29.2	51.6	20.2	15.3	27.47	3.22	23.58	16.37	11.54	20.68	22.73	11.45	14.40
14	"	8.01	6.58	6.2	17.2	18.5	7.12	13.5	8.95	19.7	34.6	31.9	23.5	10.7	19.1	23.57	19.3	36.16	13.48	12.49	19.14	22.30	16.17	1.35
15	"	8.57	3.32	10.4	19.2	12.7	27.2	29.4	34.84	28.5	53	79.9	58.9	53	31.9	24.31	12	21.36	34.43	35.13	59.93	31.94	15.19	24.12
16	301-400	28.4	28.2	52.7	52.3	37.8	45	31.6	38.53	43.4	36.7	69.5	23.7	41.7	27.5	45.17	13.1	24.13	28.09	36.28	46.86	33.60	45.26	43.03
17	"	16.2	7.26	7.71	25.2	2.44	12	45.1	45.07	15.7	31.9	44.8	36.7	30.3	10.3	12.42	8.99	13.58	26.05	38.82	24.73	24.96	33.93	27.11
18	"	6.58	3.08	31.6	22.1	3.65	8.15	24.1	59.86	12	34.8	48.4	58.2	11.2	35.9	43.36	66.4	36.13	27.11	37.85	54.03	59.03	33.72	32.87
19	"	97.1	29.6	32.5	48.3	96.2	42.5	35.7	38.99	30.8	49.6	82.5	32.2	56.2	35.5	69.55	7.86	19.29	29.00	30.79	33.03	64.52	44.84	39.03
20	401-500																	41.2	26.5	16.6	51	103	46.4	37.3
21	501-600																	23	8.77	9.12	18.8	54.9	39.8	34.7
22	601-700																	14.9	12.5	20.8	13.6	21.8	48.5	59.4
23	701-800																	18.8	1.94	6.02	22.9	52.9	21.9	33.1
24	401-500																	10.8	17	28.8	30.5	56.1	61.5	23.9
25	501-600																	138	57.7	18.7	25.3	25.6	42.5	27.5
28	401-500																	40	28.8	30.7	70.8	97.1	78.1	49.4
29	501-600																	61.9	35.8	18.1	40	89.7	70.4	56.2
30	601-700																	23.4	6.97	32.1	54.6	58.6	89	62.3
31	701-800																	35.3	12	22.9	22.4	24.9	61	20.6
32	501-600																	33	32.9	74.8	57.3	96.8	132	84.9
33	401-500																	47.9	19.7	81.4	22.2	93.5	41.4	54.7
34	501-600																	72.2	39.4	50.9	60	70.9	91.2	48.3
Total <400fth.		8.62	5.56	7.21	10.2	10.9	8.93	10	13.52	14.4	20	30.1	26.4	21.1	17.3	15.05	7.73	15.28	14.55	14.56	16.22	14.91	9.67	8.28
s.e.		0.95	0.49	1.01	1.02	1.73	1.19	0.84	1.52	1.1	1.41	1.68	1.89	1.15	0.97	0.82	0.76	0.99	0.78	0.76	1.96	1.47	0.90	1.01
Total <800fth.																		23.33	16.71	19.17	25.10	32.35	29.44	22.13
s.e.																		2.18	0.75	1.01	2.05	2.14	2.51	1.46
Total 400-800																		38.72	20.85	28.00	42.10	65.72	67.28	48.64
s.e.																		6.05	1.58	2.57	4.66	5.59	7.11	3.80

Table 26a – Greenland halibut (*Reinhardtius hippoglossoides*) abundance ('000) by age in 1991-2010 surveys for depths <400 fth.

AGE	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
1	1302	1677	1423	1429	9978	4699	2674	2200	852	3014	6459	3282	1768	1762	437	550	301	157	61	38
2	207	1260	1245	996	2045	6408	3036	1716	563	235	1153	2364	804	2644	652	312	64	78	7	9
3	348	447	777	1365	1793	1942	4822	6180	2419	479	1456	2248	489	3517	2554	525	455	121	30	29
4	1054	1023	692	1435	1535	2442	5225	8843	8419	1741	799	1342	1217	1585	2007	949	275	155	81	47
5	2307	1852	1021	1545	2136	3380	5714	9919	10787	5703	2242	3045	1991	5601	5537	4800	2765	1203	606	894
6	1291	2249	1545	2385	4099	4680	6800	9085	10119	11336	6262	4498	2362	6271	6105	6002	5928	4586	2905	2469
7	2212	1947	1627	2139	3029	2001	4014	6304	4467	4346	5328	4610	1552	2040	2345	2665	4632	4950	3255	2365
8	534	1054	1266	1180	1706	1299	1731	2108	1466	1865	2584	1025	375	518	491	623	1217	909	713	715
9	462	468	776	631	1052	341	528	600	280	361	147	104	105	233	89	180	247	283	153	259
10	352	273	213	219	209	70	177	157	82	92	36	48	79	107	97	143	165	210	215	137
11	141	138	104	90	53	21	23	27	6	44	5	16	15	63	44	103	62	100	62	50
12	12	67	38	47	18	31	17	6	3	0	0	6	4	38	15	45	38	43	47	22
13	0	25	21	18	0	0	17	16	3	0	0	0	0	5	3	10	5	18	35	10
14	0	12	9	0	5	4	0	0	5	0	0	0	0	3	3		2	10	12	2
15	15	0	0	0	0	5	6	0	0	0	0	0	0	3	3				4	
16+	8	0	0	0	0	0	9	0	0	0	0	0	0	3	3				1	
TOTAL ('000)	10245	12490	10757	13479	27659	27323	34792	47160	39470	29216	26471	22587	10762	24390	20374	16907	16156	12825	8182	7047
N5+('000)	7334	8084	6620	8254	12307	11832	19035	28221	27217	23747	16605	13352	6483	14884	14734	14571	15061	12317	8003	6923
N10+('000)	528	514	385	375	285	131	249	206	99	135	41	70	98	222	167	301	272	386	371	221

Table 26b – Greenland halibut (*Reinhardtius hippoglossoides*) abundance ('000) by age in 2004-2010 surveys for depths < 800 fth..

AGE	2004	2005	2006	2007	2008	2009	2010
1	1711	438	550	312	160	60	38
2	2689	658	312	64	80	10	9
3	3573	2562	544	476	120	40	29
4	1897	2100	1116	359	200	100	137
5	8383	6479	7156	4699	2480	1380	2447
6	11195	8315	10478	11133	11020	8330	7356
7	6082	4182	5728	10486	15340	13990	9587
8	1810	1206	1700	3530	3890	4340	3063
9	909	318	512	884	1400	1140	1200
10	447	500	440	717	1060	1260	1019
11	319	282	369	365	540	440	383
12	197	161	181	206	300	340	213
13	177	74	56	75	160	310	151
14	67	47	35	60	120	170	114
15	81	9	12	18	80	50	59
16+	57	9	10	12	70	70	55
TOTAL ('000)	39594	27340	29199	33396	37020	32030	25860
N5+('000)	29724	21582	26677	32185	36460	31820	25647
N10+ ('000)	1345	1082	1103	1453	2330	2640	1994

Table 27a – Greenland halibut (*Reinhardtius hippoglossoides*) biomass (ton.) by age in 1991-2010 surveys for depths < 400 fth..

AGE	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
1	37	65	43	50	376	161	87	91	29	107	270	105	49	71	16	31	6	3	1	1
2	20	170	136	114	249	961	386	246	76	26	176	315	85	138	72	29	6	3	0	1
3	256	134	160	374	386	466	1200	1802	596	93	337	404	116	560	455	109	63	15	4	3
4	609	640	204	602	530	1006	1821	3472	3302	633	326	506	456	487	676	343	85	37	18	14
5	1619	1403	510	845	984	1872	2653	4960	5338	2709	1149	1649	1116	2634	2818	2602	1441	627	284	443
6	1231	1930	1085	1631	2490	3233	4057	5746	6274	7162	4200	3202	1877	4179	4390	4165	4161	3343	2039	1681
7	2502	1895	1418	1782	2299	1748	3101	4763	3576	3539	4470	4427	1745	2118	2408	2468	4484	5019	3346	2339
8	666	1169	1344	1231	1683	1415	1727	2109	1481	1977	2570	1222	511	725	657	722	1553	1224	984	945
9	471	590	979	811	1341	473	714	726	376	437	222	161	178	385	153	238	383	447	244	363
10	446	358	314	344	348	113	280	214	148	150	66	93	157	211	199	219	301	392	409	245
11	221	202	185	157	104	57	64	36	11	88	13	32	37	134	106	176	138	215	138	102
12	33	108	71	60	41	57	32	9	8	0	0	15	11	86	43	84	102	101	114	57
13	0	46	48	35	0	0	36	34	8	0	0	0	0	20	0	22	14	50	93	25
14	0	16	36	0	15	20	0	0	14	0	0	0	0	13	0		6	30	35	6
15	51	0	0	0	0	19	13	0	0	0	0	0	0	0	0			12		
16+	34	0	0	0	0	0	30	0	0	0	0	0	0	13	0			3		
Biomass (ton.)	8196	8724	6533	8037	10848	11601	16203	24207	21235	16921	13799	12132	6339	11775	11992	11207	12743	11521	7710	6225
Biomass 5+	7274	7716	5990	6896	9307	9007	12708	18596	17233	16062	12691	10802	5632	10519	10774	10696	12583	11464	7686	6206
Biomass 10+	785	729	654	597	509	267	455	293	188	238	79	139	205	479	347	501	562	803	789	435

Table 27b – Greenland halibut (*Reinhardtius hippoglossoides*) biomass (ton.) by age in 2004-2010 surveys for depths < 800 fth..

AGE	2004	2005	2006	2007	2008	2009	2010
1	104	16	15	7	3	1	1
2	145	72	17	6	3	1	1
3	586	451	81	66	15	5	3
4	617	725	335	116	51	22	44
5	4166	3382	3743	2490	1324	672	1219
6	7870	6112	7377	7927	8155	5948	5105
7	6587	4471	5831	10413	15969	14941	9750
8	2565	1673	2271	4614	5333	6115	4101
9	1518	557	805	1391	2230	1835	1752
10	891	1028	831	1334	1973	2407	1903
11	702	671	818	831	1183	985	805
12	467	547	453	559	732	840	539
13	666	278	185	234	459	864	424
14	240	238	181	233	393	566	388
15	359	50	71	71	292	200	209
16+	328	62	69	60	383	338	284
Biomass (ton)	27812	20332	23082	30351	38497	35740	26527
Biomass 5+	26360	19068	22635	30157	38426	35710	26479
Biomass 10+	3654	2874	2608	3322	5414	6199	4552

Table 28 – Roughhead grenadier (*Macrourus berglax*) mean catch per standard tow by strata and its standard error in the 2010 survey.

stratum	Area sq. miles	tow number	catch per standard tow (Kg)	
			mean	st. error
1	342	4		
2	838	7		
3	628	5		
4	348	4		
5	703	6		
6	496	6		
7	822	8		
8	646	6		
9	314	3		
10	951	7		
11	806	7		
12	670	8	0.67	1.26
13	249	3	2.91	3.88
14	602	5	0.04	0.09
15	666	6	1.48	1.71
16	634	5	0.93	0.68
17	216	2	9.64	6.15
18	210	2	24.47	5.32
19	414	3	1.25	0.69
20	525	5	5.08	4.12
21	517	5	16.47	16.14
22	533	4	13.61	9.33
23	284	2	10.25	4.53
24	253	3	6.15	5.45
25	226	3	4.93	4.36
28	530	5	4.79	2.01
29	488	6	7.82	5.38
30	1134	12	18.62	13.42
31	203	2	3.94	2.81
32	238	3	7.62	5.97
33	98	2	4.38	0.5
34	486	4	6.46	6.02
Total (1-19 strata)	10555	97	4.24	0.43
Total (1-34 strata)	16070	153	1.00	0.14

Table 29a. – Roughhead grenadier (*Macrourus berglax*) mean length frequency per tow in the 2010 survey for depths < 400 fth.

length	male	female	length	male	female	length	male	female
3	0.012	0.039	14	0.083	0.057	25		0.067
4	0.000	0.029	15	0.059	0.063	26		0.021
5	0.046	0.090	16	0.165	0.076	27		0.042
6	0.053	0.088	17	0.194	0.111	28		0.035
7	0.023	0.029	18	0.218	0.161	29		0.025
8	0.036	0.076	19	0.130	0.131	30		0.012
9	0.000	0.040	20	0.210	0.043	31		
10	0.000	0.024	21	0.071	0.179	32		
11		0.000	22	0.059	0.023	33		0.011
12	0.011	0.009	23	0.022	0.065			
13	0.009	0.011	24	0.000	0.059			

Table 29b. – Roughhead grenadier (*Macrourus berglax*) mean length frequency per tow in the 2010 survey for depths < 800 fth.

length	male	female	length	male	female	length	male	female
3	0.013	0.026	16	0.642	0.243	29	0.000	0.141
4	0.010	0.033	17	0.538	0.238	30		0.199
5	0.041	0.084	18	0.387	0.218	31		0.106
6	0.143	0.133	19	0.279	0.130	32		0.053
7	0.053	0.059	20	0.289	0.145	33		0.097
8	0.136	0.147	21	0.143	0.239	34		0.039
9	0.127	0.079	22	0.094	0.128	35		0.020
10	0.114	0.157	23	0.039	0.208	36		0.021
11	0.208	0.164	24	0.009	0.254	37		0.042
12	0.320	0.188	25		0.212	38		0.029
13	0.325	0.210	26	0.000	0.220	39		0.013
14	0.366	0.218	27		0.206	40		0.007
15	0.575	0.226	28		0.200	41		0.010

Table 30 - Roughhead grenadier (*Macrourus berglax*) age-length key in the 2010 survey.**MALE**

Length cm	age																id	Total
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16+		
1																		
2																		
3																		
4		1																1
5		3	2															5
6		1	15															16
7			5	2														7
8			5	14														19
9				13	1												1	15
10				6	10													16
11				1	16	6												23
12					7	14												21
13					1	12	9	1									1	24
14						4	17										1	22
15						1	3	21	2								5	32
16							2	23	7								4	36
17								18	6									24
18								2	17	3								22
19									11	10								21
20										12	8							20
21										1	7	7	2	1				18
22											3	6	4					13
23												2	3					5
24													1					1
total		5	27	36	35	37	31	65	44	35	23	10	1				12	361

Table 30 (Continued)

FEMALE

Length cm	age																id	Total	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16+			
1																			
2																			
3																			
4		1	1																2
5		5	5																10
6			14																14
7			5	2															7
8			7	13															20
9				7	1														8
10				5	16														21
11					13	6													19
12					1	18													19
13					2	11	9												22
14						2	15	3											20
15							7	12	2										21
16							1	21										1	23
17								15	7										22
18								3	16	1									20
19								1	12	5	1								19
20									4	11	1								16
21									2	10	7	1							20
22										3	12	1							16
23										2	10	8	1						21
24											1	13	6					1	21
25											2	6	8	3				2	21
26												4	12	3	1				20
27												1	4	14	1				20
28													2	14	3	1			20
29														5	8	5			18
30														3	10	10			23
31																15			15
32																6	1		7
33															1	12			13
34																5			5
35																2			2
36																3			3
37																5			5
38																3			3
39																2			2
40																1			1
41																1			1
total		6	32	27	33	37	32	55	43	32	34	34	33	42	24	71	5		540

Table 31 – Roughhead grenadier (*Macrourus berglax*) mean frequency at age per tow and strata in the 2010 survey.

age	strata																				total	mean weight g	mean length cm	
	12	13	14	15	16	17	18	19	20	21	22	23	24	25	28	29	30	31	32	33				34
1	0.01				0.02									0.01								0.03	3	3
2					0.02	0.01	0.00	0.02	0.00	0.01	0.01		0.00	0.01	0.00	0.01	0.00			0.00		0.10	11	5
3		0.01			0.06	0.04	0.03	0.06	0.05	0.05	0.02	0.01	0.03	0.02	0.02	0.03	0.04	0.01	0.01	0.00	0.02	0.51	25	6
4					0.03	0.03	0.02	0.01	0.05	0.12	0.01	0.01	0.03	0.01	0.01	0.04	0.07	0.02	0.01	0.00	0.03	0.50	60	9
5		0.00		0.01	0.01	0.02	0.01	0.01	0.03	0.10	0.05	0.02	0.01	0.03	0.02	0.05	0.15	0.01	0.05	0.00	0.03	0.62	116	11
6		0.01		0.01	0.01	0.00	0.02	0.01	0.04	0.16	0.03	0.07	0.01	0.04	0.03	0.06	0.24	0.02	0.10	0.00	0.04	0.89	170	12
7		0.01		0.02			0.05	0.02	0.03	0.10	0.03	0.07	0.01	0.03	0.02	0.04	0.26	0.02	0.08	0.01	0.06	0.86	238	14
8	0.01	0.03	0.01	0.05	0.01	0.02	0.18	0.06	0.03	0.13	0.11	0.11	0.01	0.05	0.04	0.14	0.64	0.07	0.13	0.02	0.11	1.95	350	16
9	0.02	0.04		0.06	0.02	0.05	0.18	0.03	0.01	0.10	0.07	0.03	0.01	0.02	0.03	0.06	0.27	0.03	0.05	0.01	0.09	1.19	474	18
10	0.02	0.02		0.03	0.02	0.05	0.14	0.01	0.01	0.09	0.03	0.02	0.01	0.01	0.01	0.04	0.18	0.01	0.01	0.01	0.03	0.74	670	20
11	0.01	0.01		0.01	0.00	0.04	0.10	0.00	0.02	0.06	0.03	0.00	0.02	0.02	0.01	0.04	0.15	0.00	0.00	0.01	0.02	0.56	838	22
12	0.00	0.00		0.01	0.00	0.03	0.05		0.01	0.05	0.06		0.02	0.01	0.01	0.03	0.14	0.00		0.01	0.03	0.46	1108	24
13	0.00	0.00		0.00	0.00	0.02	0.03		0.02	0.06	0.04		0.01	0.01	0.01	0.02	0.14		0.00	0.00	0.02	0.38	1329	25
14	0.00	0.00			0.00	0.01	0.03		0.02	0.05	0.05		0.02	0.01	0.01	0.01	0.15		0.01	0.00	0.02	0.42	1667	27
15					0.00	0.01	0.01		0.00	0.03	0.03		0.01	0.00	0.02	0.01	0.07		0.00		0.01	0.21	1982	29
16+					0.00	0.00	0.01		0.03	0.03	0.09	0.05	0.02	0.01	0.03	0.03	0.22	0.01	0.01		0.02	0.57	2861	33

Table 32 – Roughhead grenadier (*Macrourus berglax*) mean catch per standard tow (Kg) by strata in 1988-2010 surveys.

Estrato	depth in fathoms	year																						
		1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
1	70- 80																							
2	81-100								0.13															
3	101-140																	0.21						
4	"																0.34							
5	"																							
6	"								0.58															
7	141-200												0.05					0.16						
8	"		0.20		0.02				0.22	0.06		0.14	1.88	1.21	1.21	0.04	0.26	0.57	1.32	0.26				
9	"	1.96	0.17		0.21	1.17	0.88	0.13	0.88	6.40	0.75	1.67	1.21	1.21		1.25	11.79	3.43	7.57	0.71	1.63			
10	"	0.01								0.08	0.01		0.25	0.94	0.25			0.66	0.52	0.29				
11	"											0.05	0.13	0.10				0.05	0.03					
12	201-300	2.19	2.02	0.78	2.12	1.96	8.09	1.08	2.47	0.90	2.68	1.08	3.74	1.59	4.62	3.02	3.23	5.72	4.06	1.90	0.43	1.80	1.43	1.18
13	"	1.11	3.37	0.95	0.95	3.16	0.95	1.69	3.95	0.26	0.95	4.11	4.85	2.64	6.11	6.38	6.48	15.76	4.95	8.12	4.22	5.69	1.32	5.11
14	"	4.36	3.16	2.33	1.85	3.03		1.59	1.46	5.89	1.68	4.23	2.94	2.25	6.37	2.70	7.54	19.12	8.26	7.89	4.86	11.75	0.02	0.07
15	"	1.81	0.10	0.57	1.26	1.02	6.33	1.62	3.55	1.66	1.36	1.99	1.42	2.03	1.18	0.32	1.71	5.10	0.32	1.68	1.08	0.24		2.60
16	301-400	7.22	2.90	4.39	4.74	8.94	27.60	10.83	5.30	8.22	4.37	8.38	3.11	4.66	7.00	5.63	7.29	12.30	8.82	28.80	5.01	10.21	4.41	1.64
17	"	8.14	2.73	1.88	10.94	7.47		5.95	7.84	1.64	7.05	12.40	5.83	4.07	22.48	23.09	6.14	14.83	7.53	36.64	4.25	23.39	2.43	16.89
18	"	19.44	8.00	8.94	22.25	13.44		47.25	25.88	9.63	14.00	11.81	19.56	13.69	23.94	1.69	54.81	26.44	36.75	27.19	30.69	38.13	12.13	42.81
19	"	23.56	7.20	8.65	9.16	13.60	29.01	11.16	8.94	5.93	10.21	13.44	4.09	2.92	6.85	3.68	7.77	7.23	11.60	18.77	5.29	21.65	7.45	2.19
20	401-500																	10.48	4.55	8.83	3.60	6.73	3.25	8.88
21	501-600																	36.35	25.29	19.37	19.17	28.28	13.40	28.81
22	601-700																	26.96	27.46	38.05	14.97	42.72	29.94	23.81
23	701-800																	41.45	21.40	15.81	15.34	18.44	14.10	17.93
24	401-500																	7.11	53.43	21.74	8.56	7.89	7.57	10.74
25	501-600																	19.98	50.53	47.45	11.44	22.71	21.02	8.65
28	401-500																	10.52	17.21	15.11	7.40	8.92	6.76	8.37
29	501-600																	83.73	27.22	11.97	14.17	14.93	11.40	13.69
30	601-700																	41.12	33.21	12.82	24.76	38.84	29.63	32.59
31	701-800																	42.03	21.14	15.19	15.65	11.38	14.55	6.92
32	501-600																	15.11	14.72	7.28	4.74	12.24	10.86	13.35
33	401-500																	15.80	2.28	16.34	14.06	5.09	1.61	7.63
34	501-600																	30.54	8.91	13.80	8.24	11.07	3.89	11.32
total (1-19)		2.50	1.08	1.06	1.66	1.96	3.76	2.46	1.94	1.69	1.49	2.10	1.55	1.30	2.59	1.51	2.92	4.47	2.97	4.89	1.70	3.68	0.97	1.74
d,t,(1-19)		0.33	0.18	0.18	0.31	0.34	0.61	0.21	0.28	0.34	0.21	0.30	0.42	0.24	0.35	0.22	0.76	0.45	0.35	0.87	0.39	0.76	0.26	0.25
total																		14.04	10.26	9.26	5.94	9.91	5.96	7.43
d,t, total																		1.28	1.16	0.95	0.66	1.08	0.78	0.76

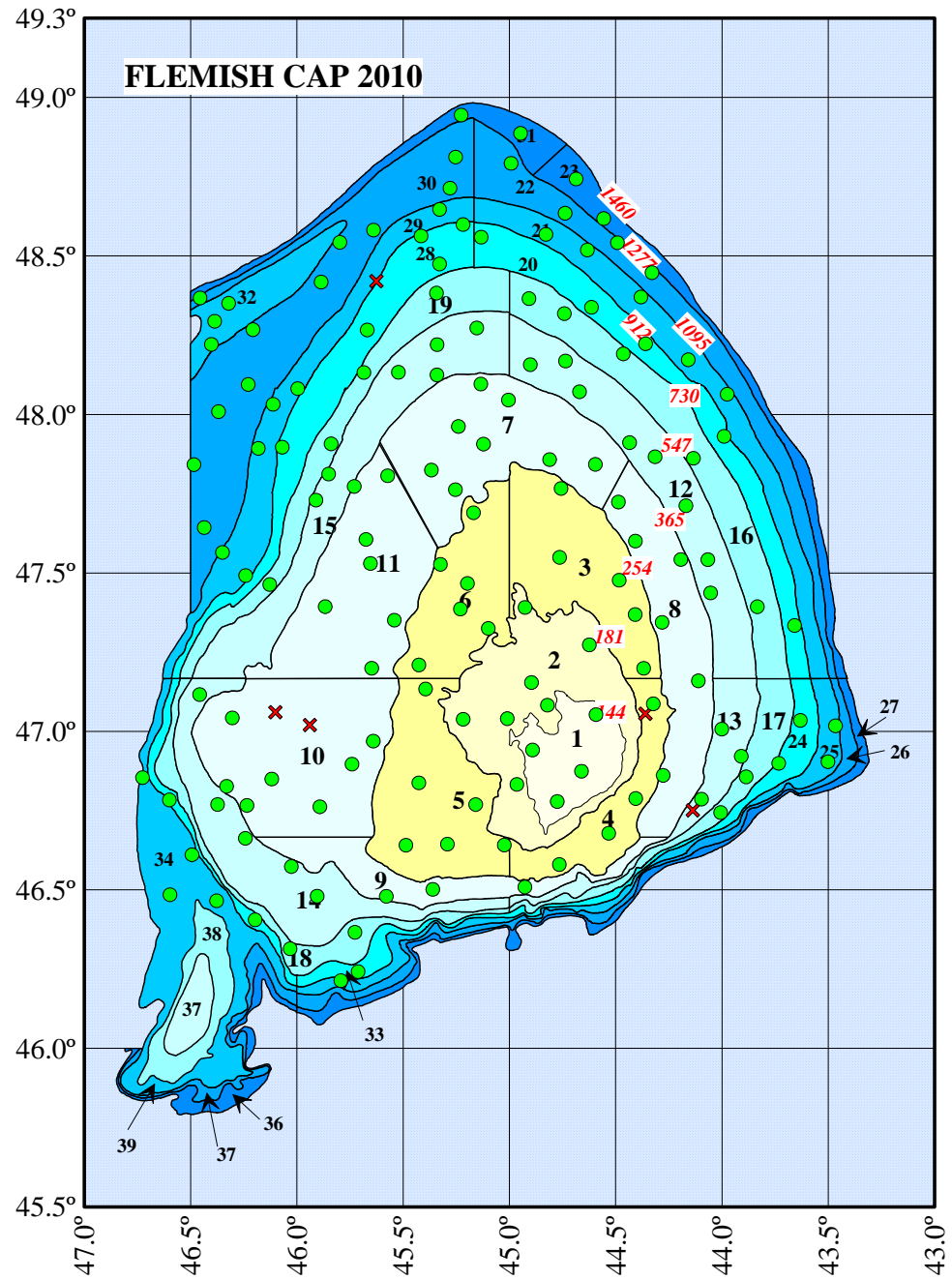


Figure 1 - Haul positions for the Flemish Cap survey 2010.

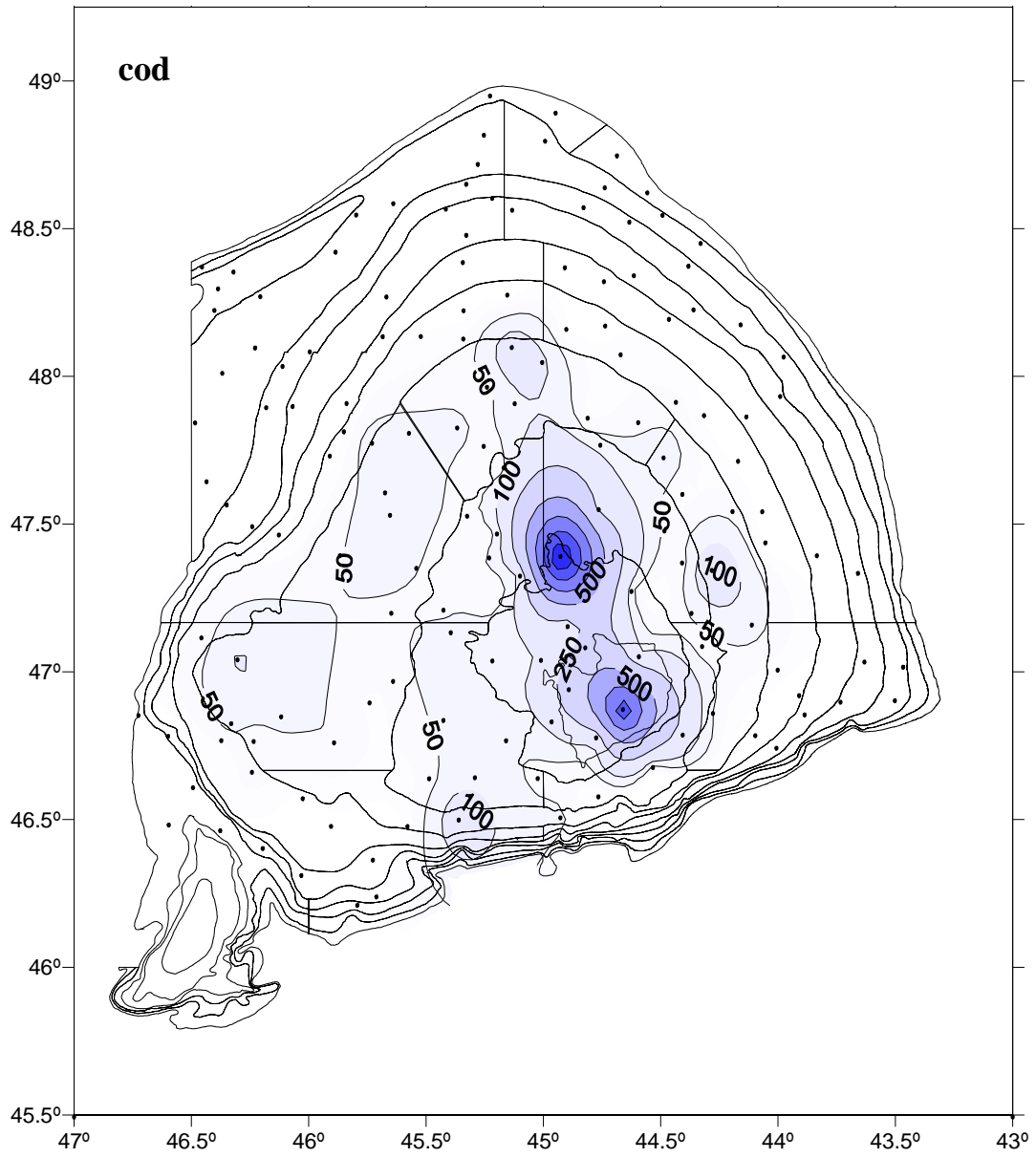


Figure 2 - Cod (*Gadus morhua*) catch distribution in the 2010 survey in Kg.

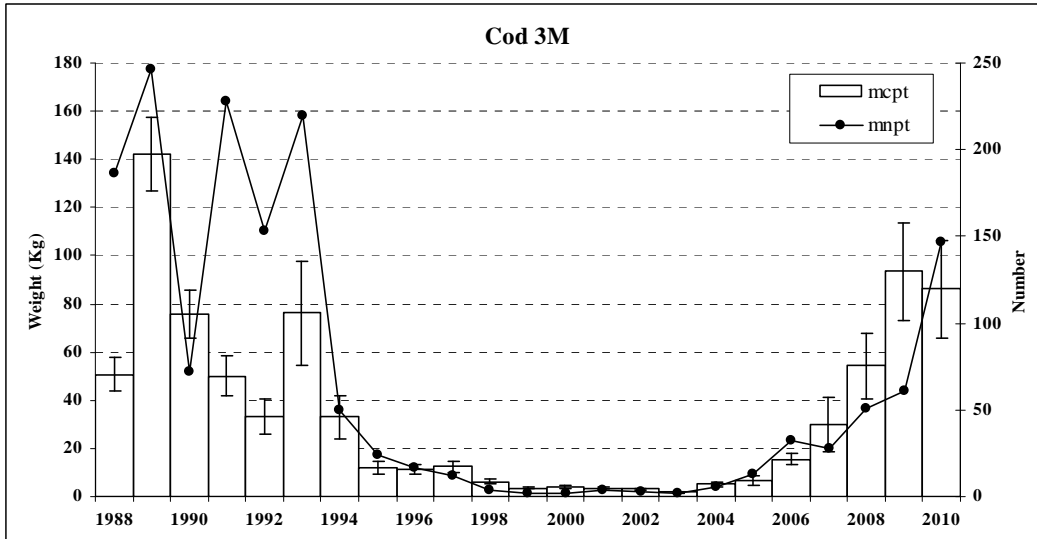


Figure 3.- Cod mean catches (kg) ± S.E. and mean number per standard tow 1988-2010.

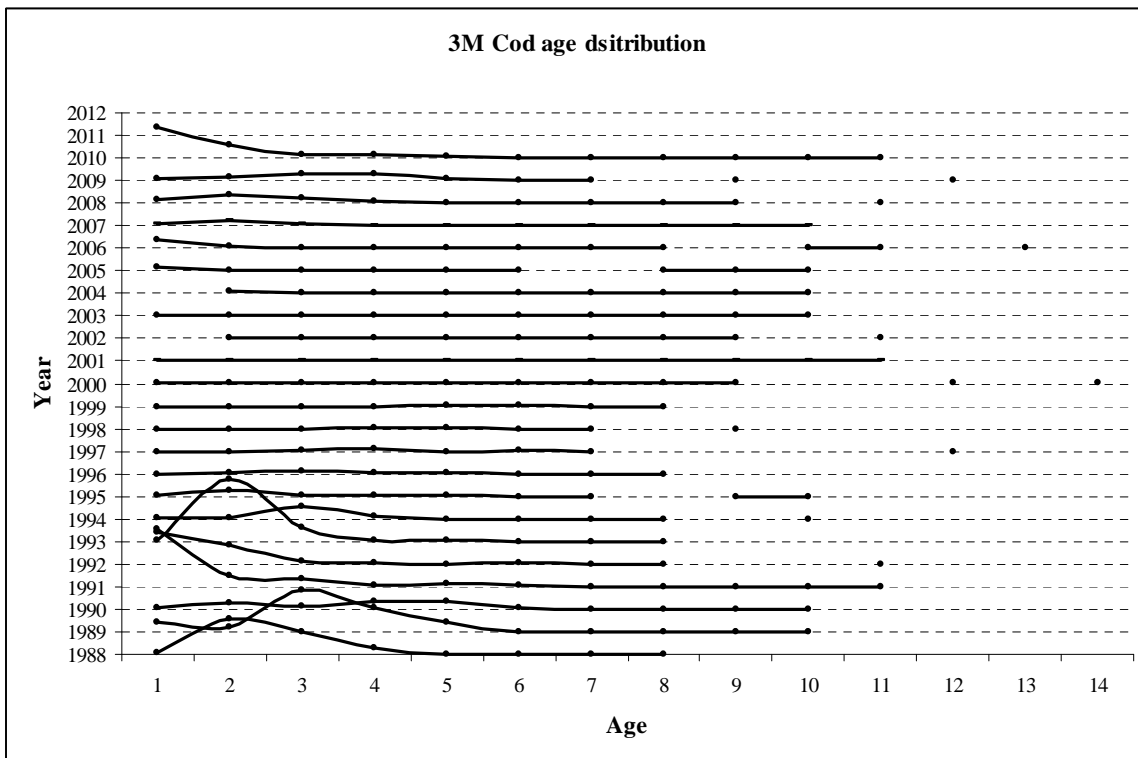


Figure 4.- Cod age distribution on Flemish Cap NAFO 3M 1988-2010.

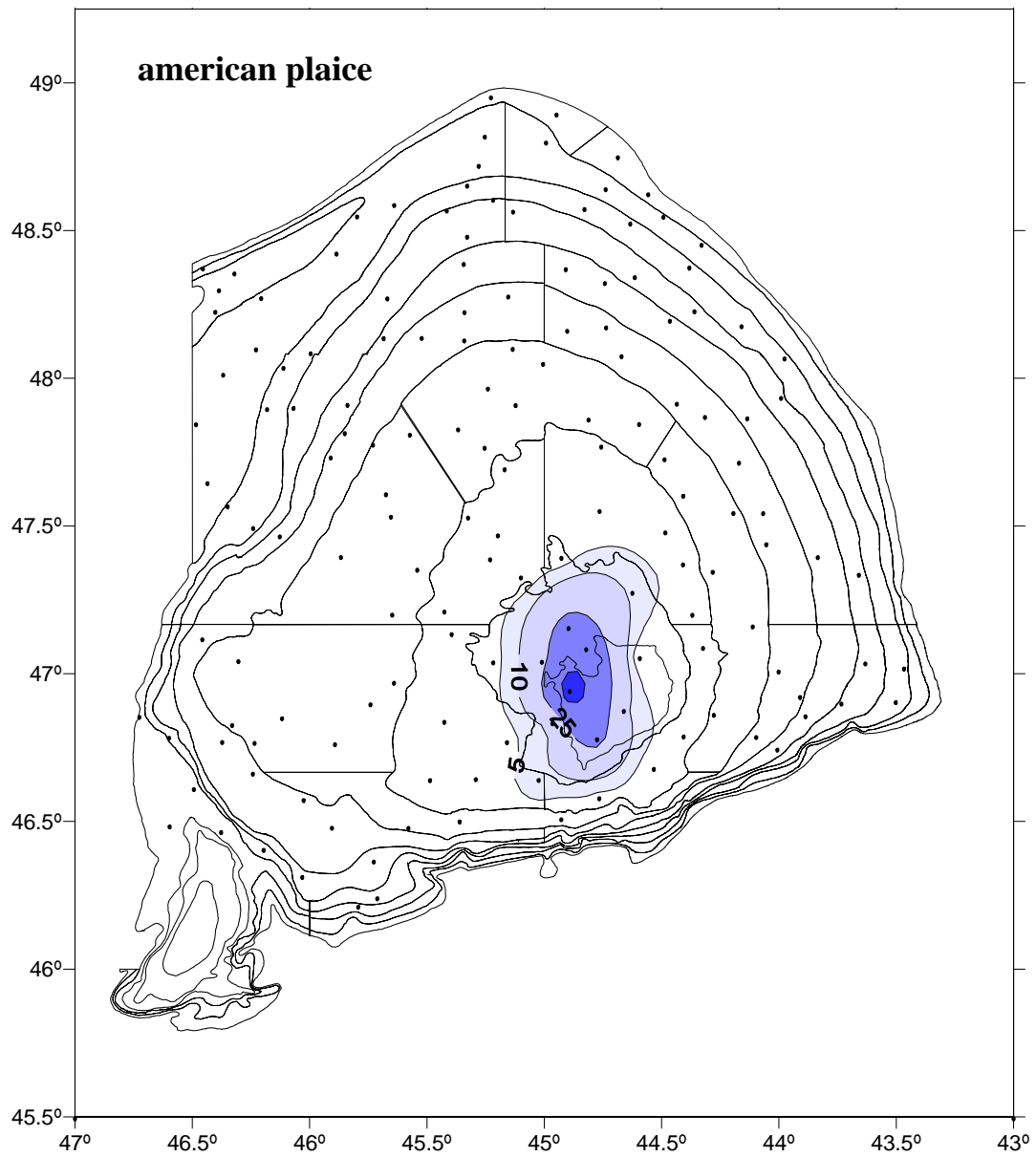


Figure 5 - American plaice (*Hippoglossoides platessoides*) catch distribution (kg) in the 2010 survey.

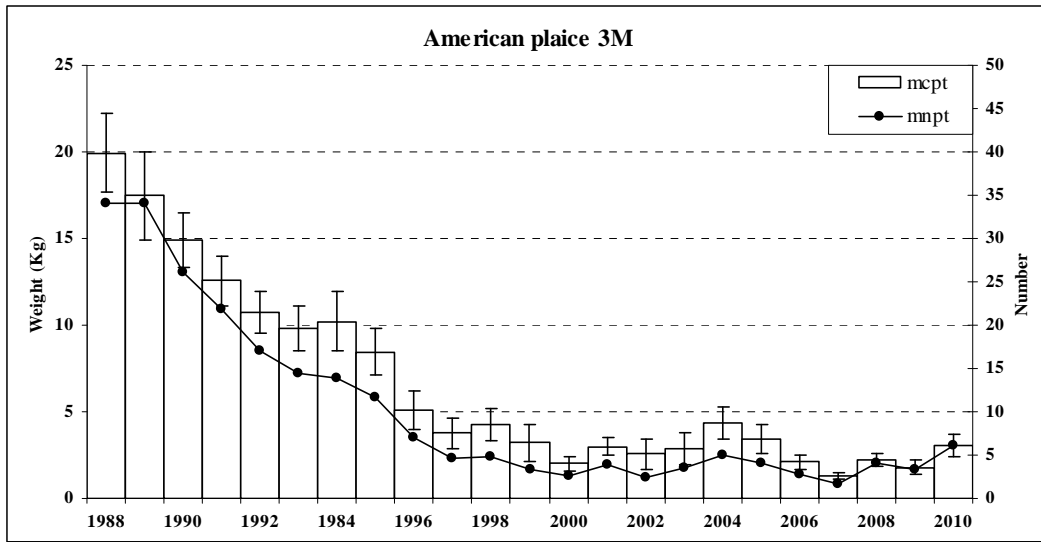


Figure 6.- American plaice (*Hippoglossoides platessoides*) mean catches (kg) \pm S.E. and mean number per standard tow 1988-2010.

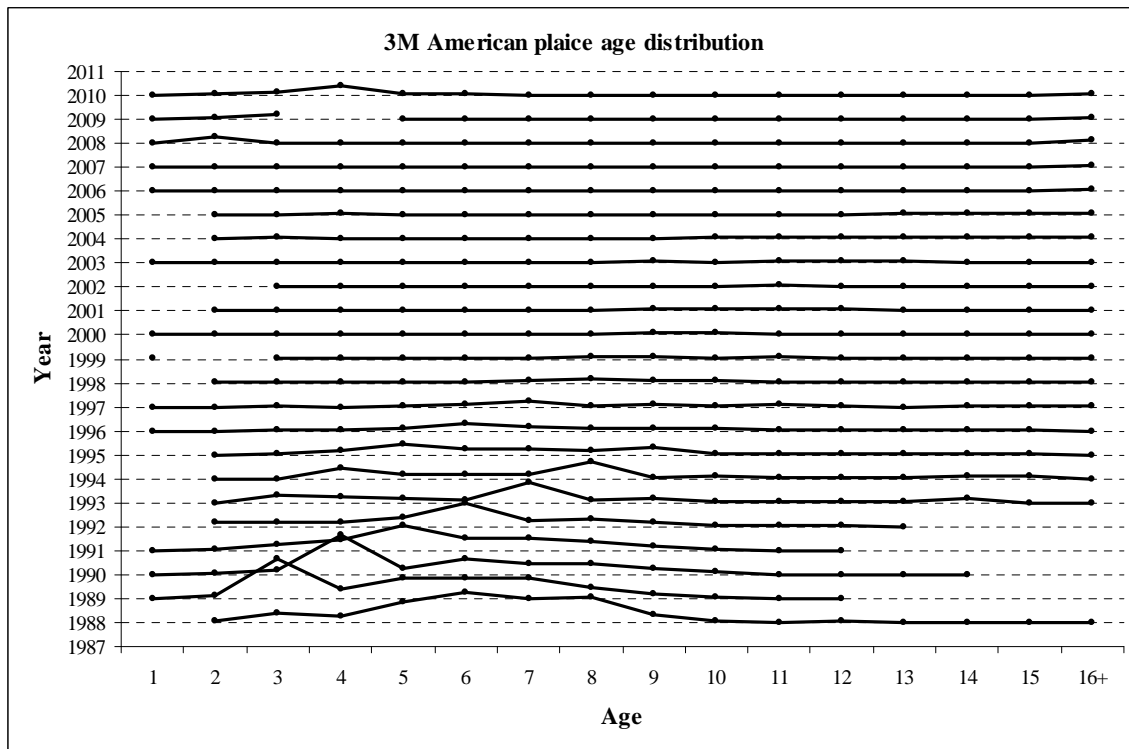


Figure 7.- American plaice age distribution on Flemish Cap, NAFO Div. 3M: 1988-2010.

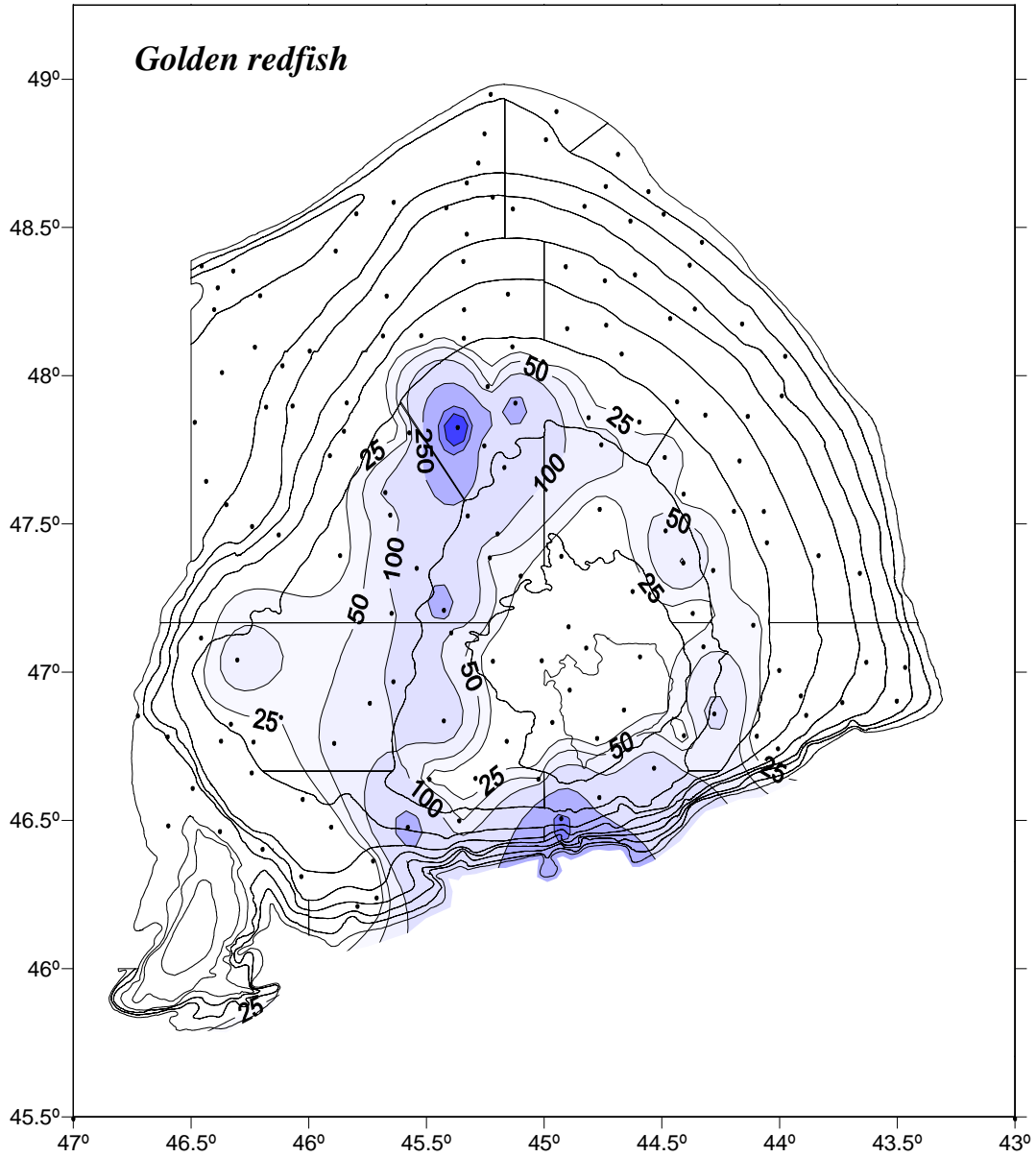


Figure 8.- Golden redfish (*Sebastes marinus*) catch distribution (kg) in the 2010 survey .

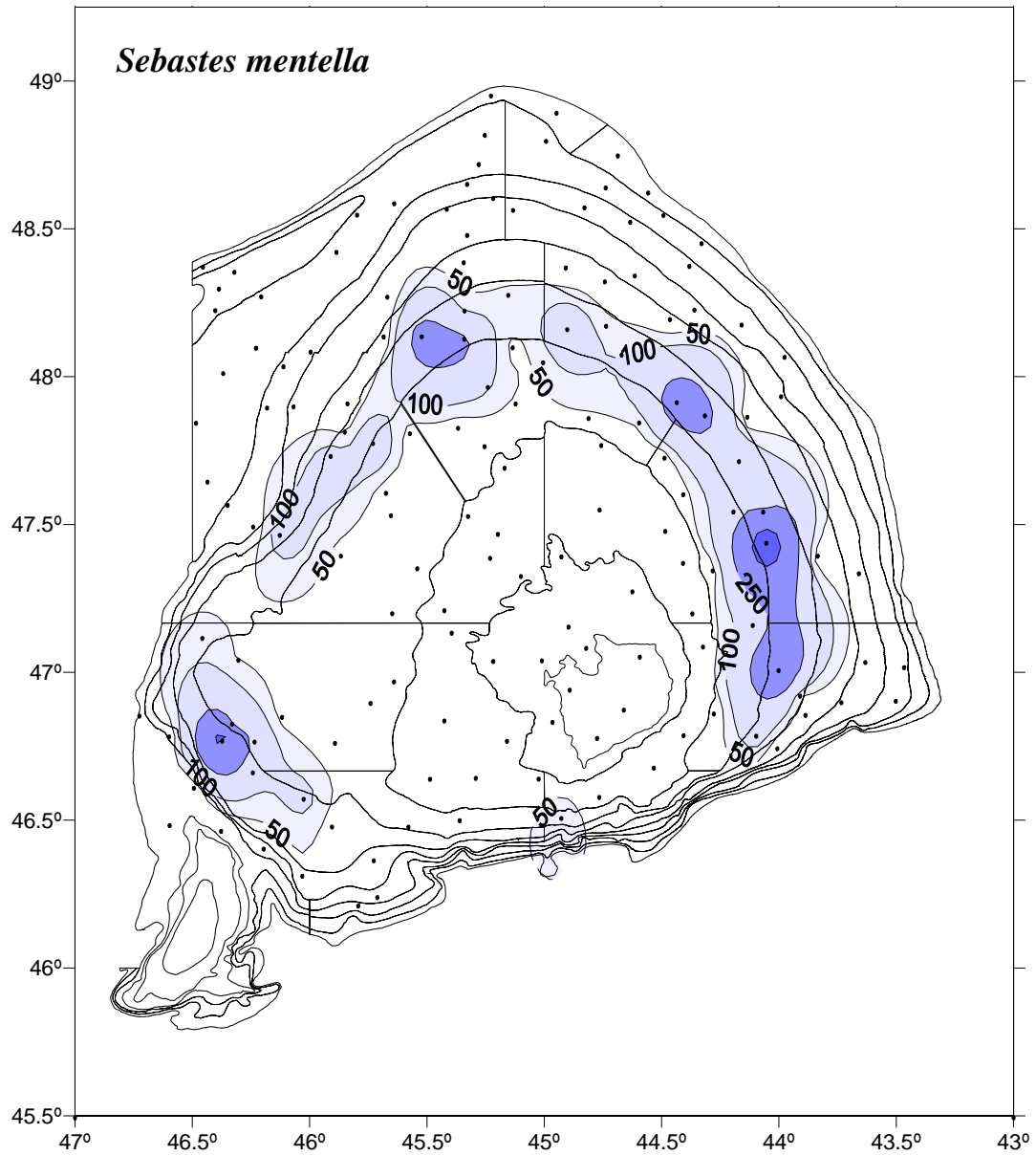


Figure 9. – Redfish (*Sebastes mentella*) catch distribution (kg) in the 2010 survey.

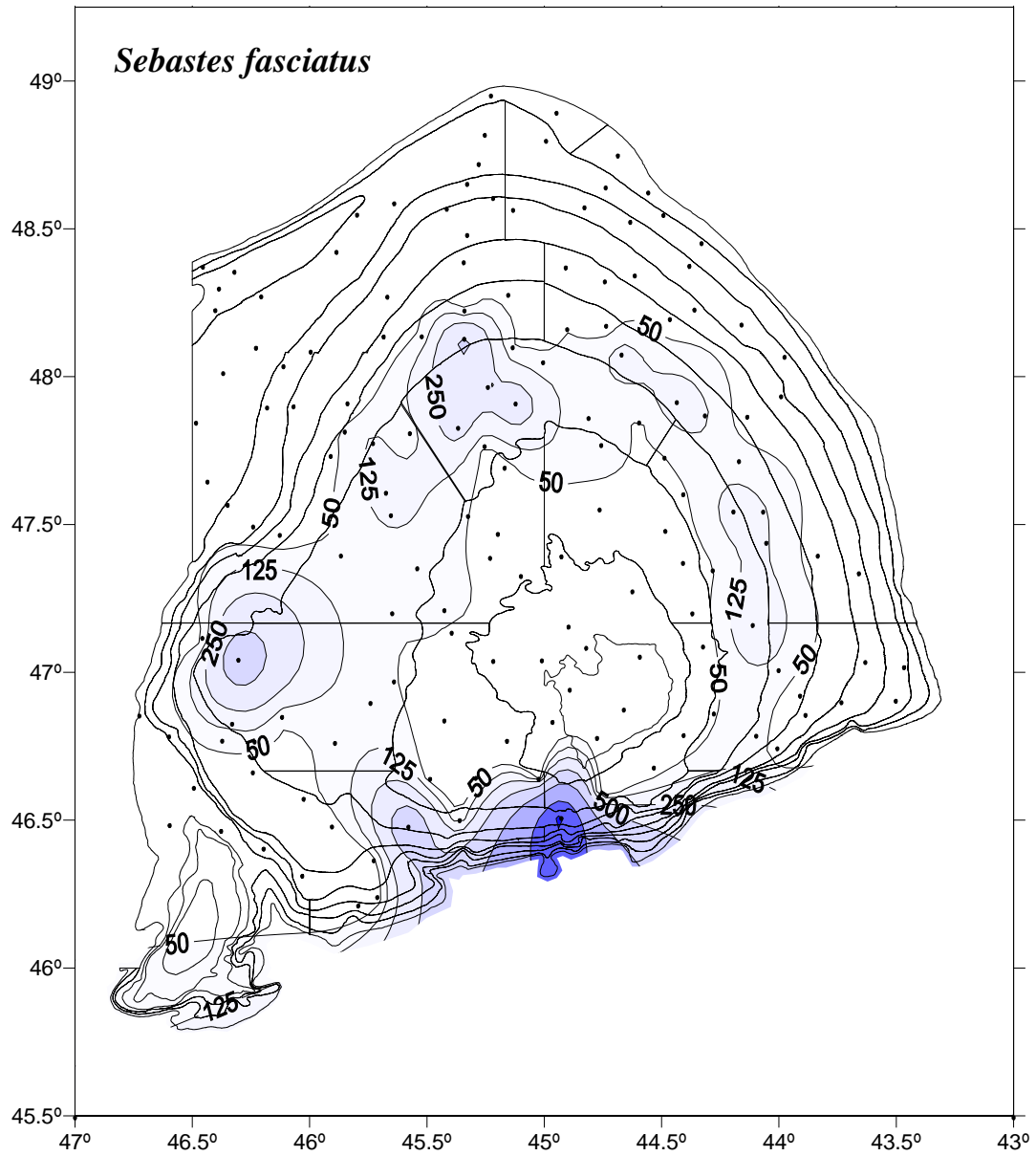


Figure 10. - Redfish (*Sebastes fasciatus*) catch distribution in the 2010 (kg) survey.

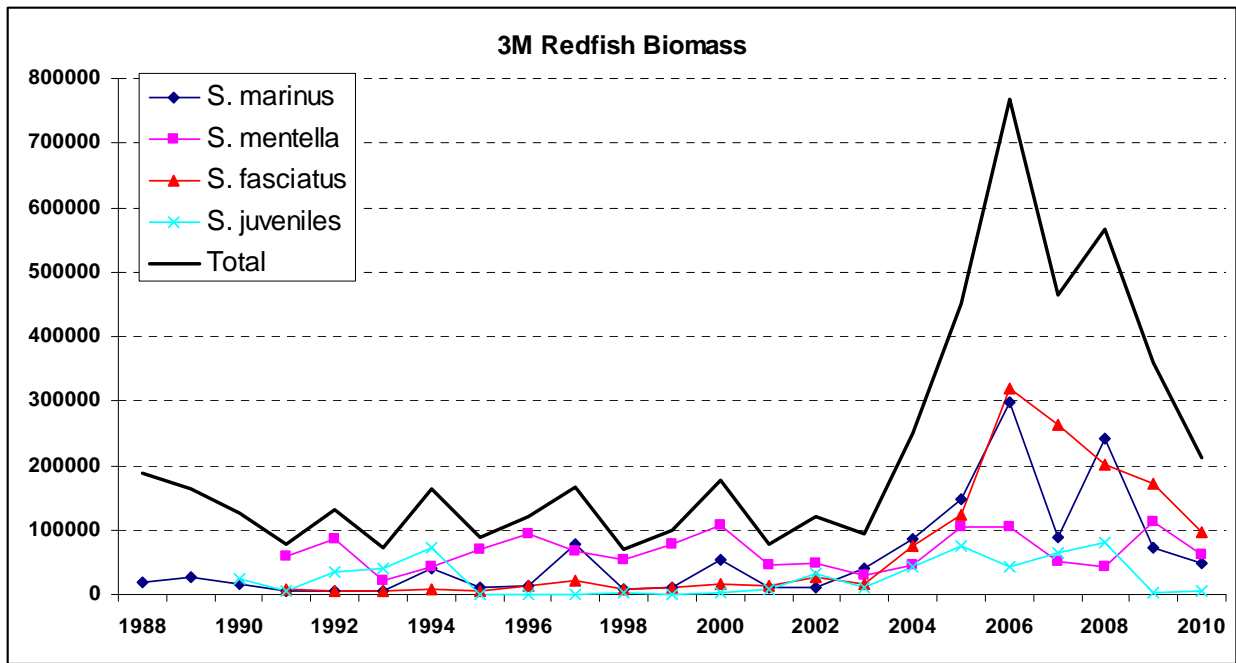


Figure 11. - Redfish (*Sebastes*) biomass in 1988-2010

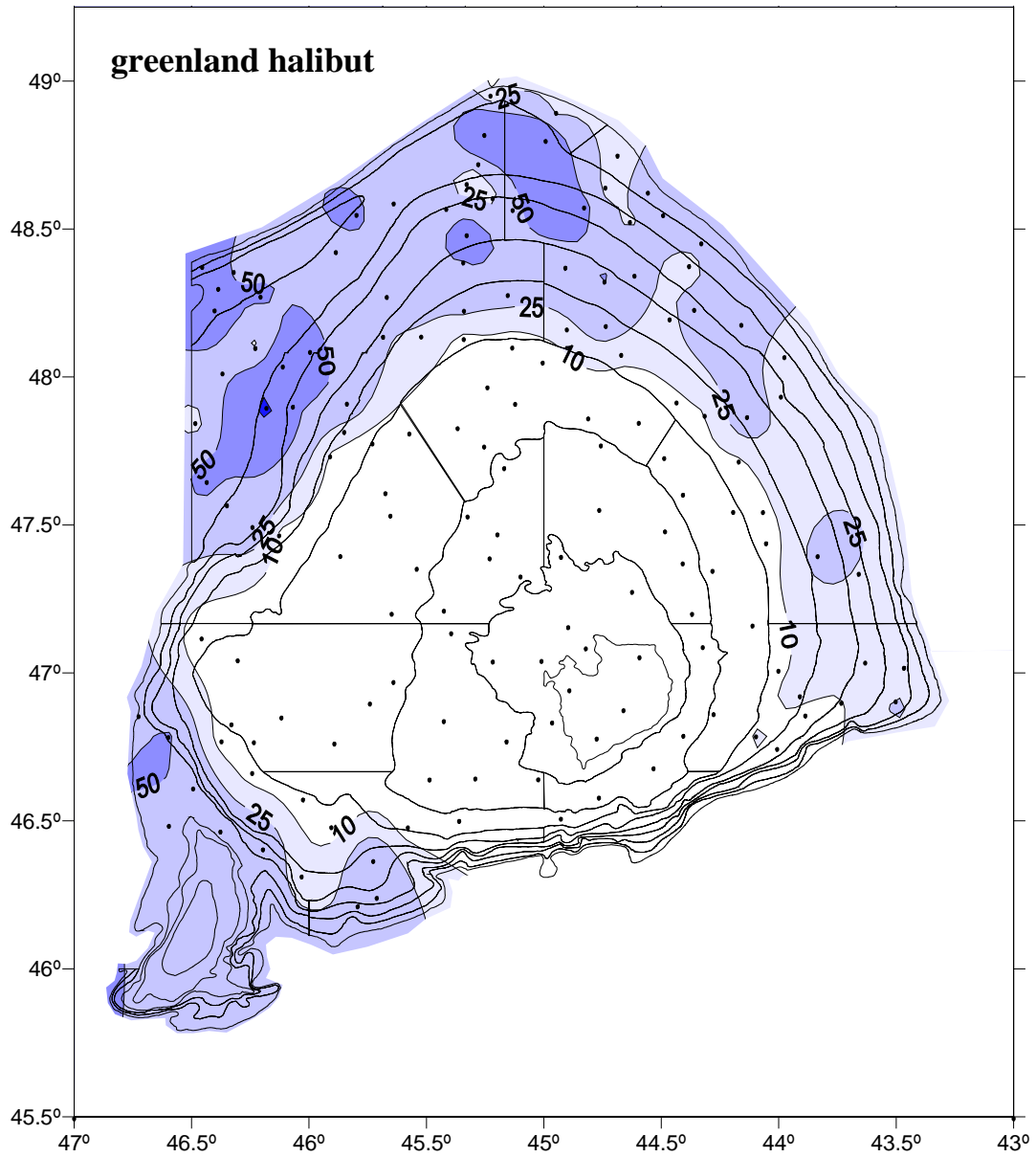


Figure 12. - Greenland halibut (*Reinhardtius hippoglossoides*) catch distribution (kg) in the 2010 survey.

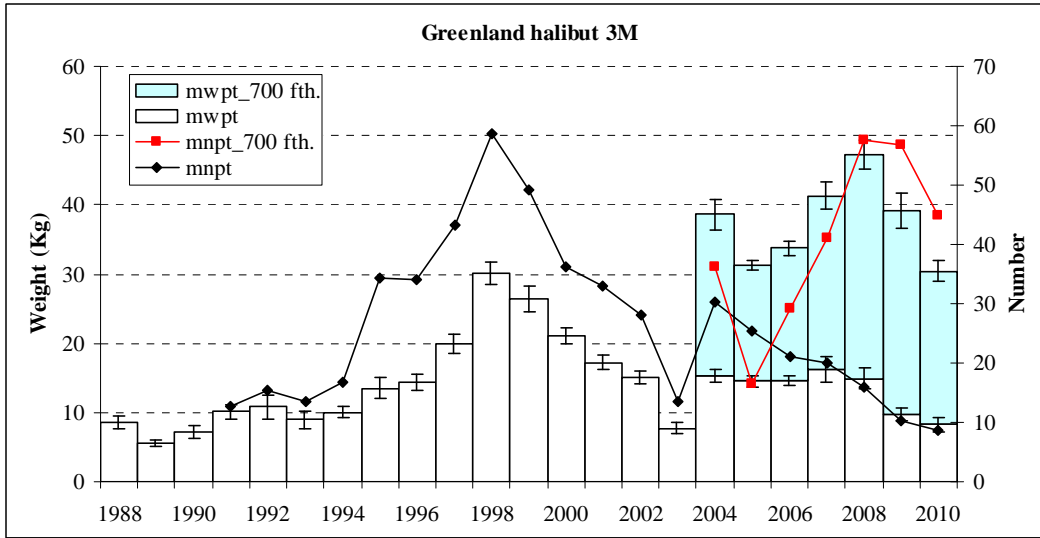


Figure 13. - Greenland halibut (*Reinhardtius hippoglossoides*) mean catches (kg) \pm S.E. and mean number per standard tow 1988-2010.

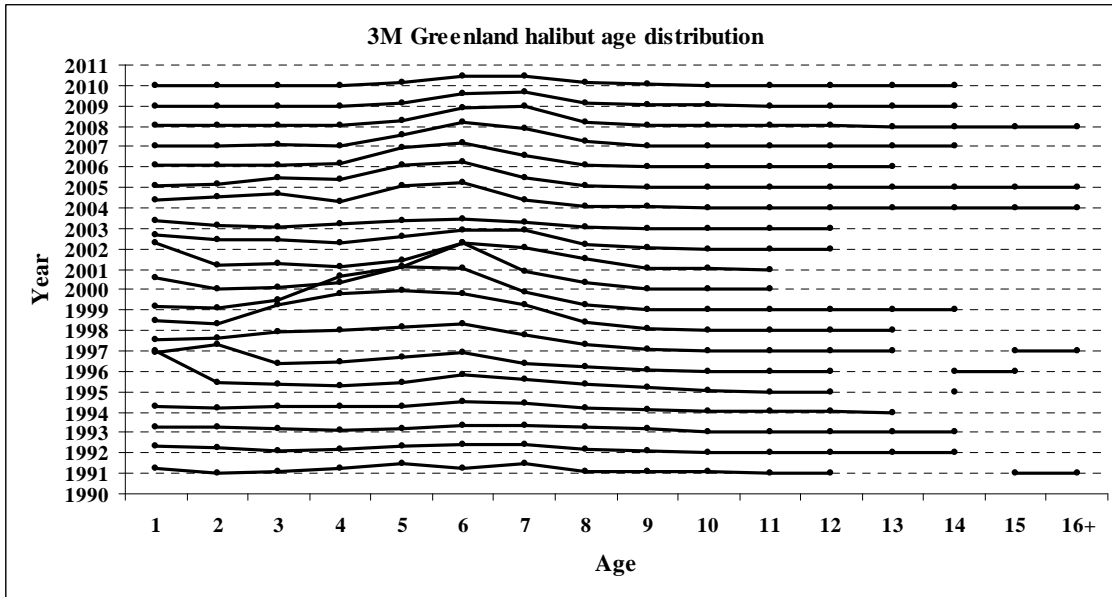


Figure 14.- Greenland halibut age distribution on Flemish Cap, NAFO Div. 3M: 1988-2010.

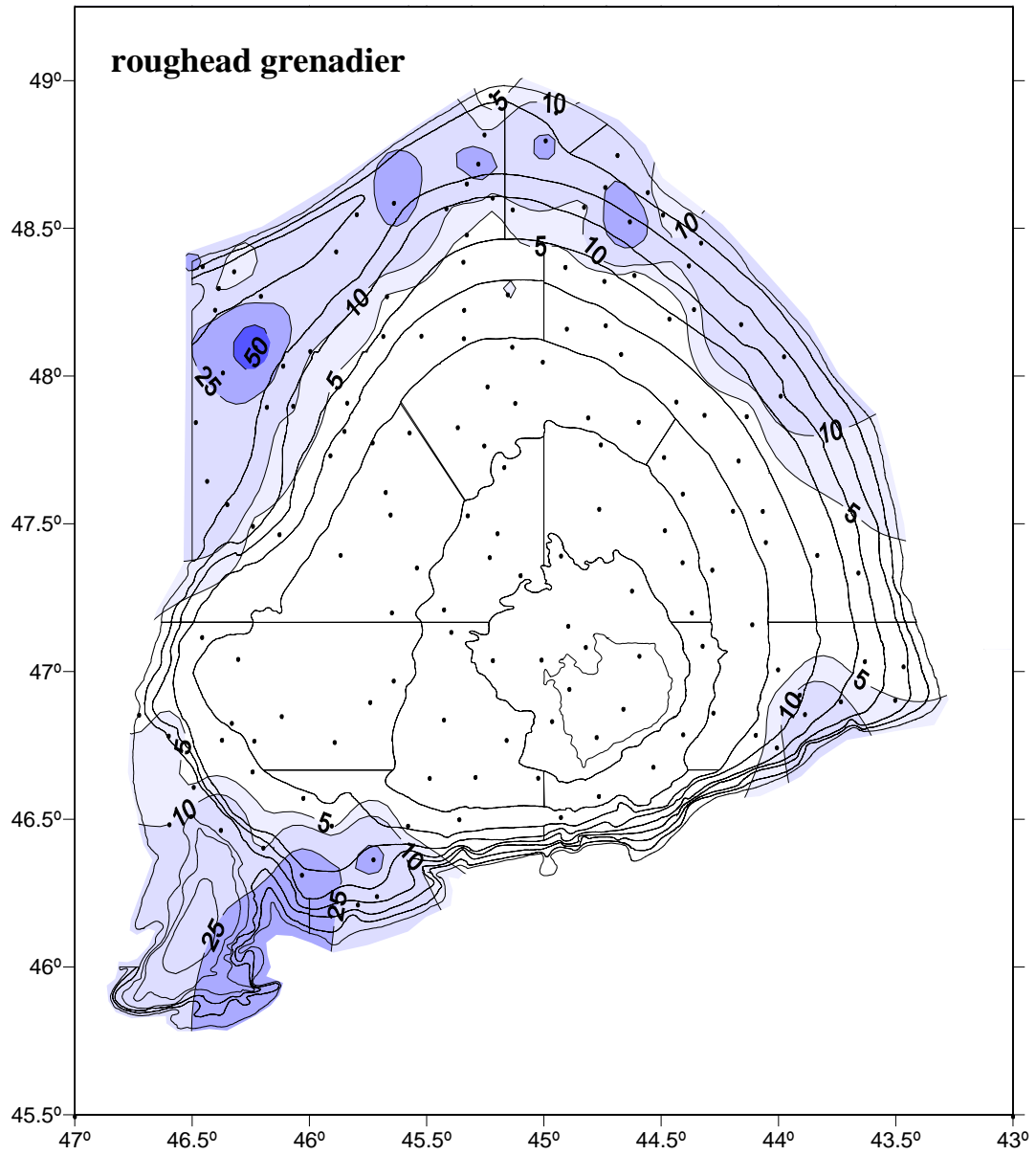


Figure 15. – Roughhead grenadier (*Macrourus berglax*) catch distribution (kg) in the 2010 survey.

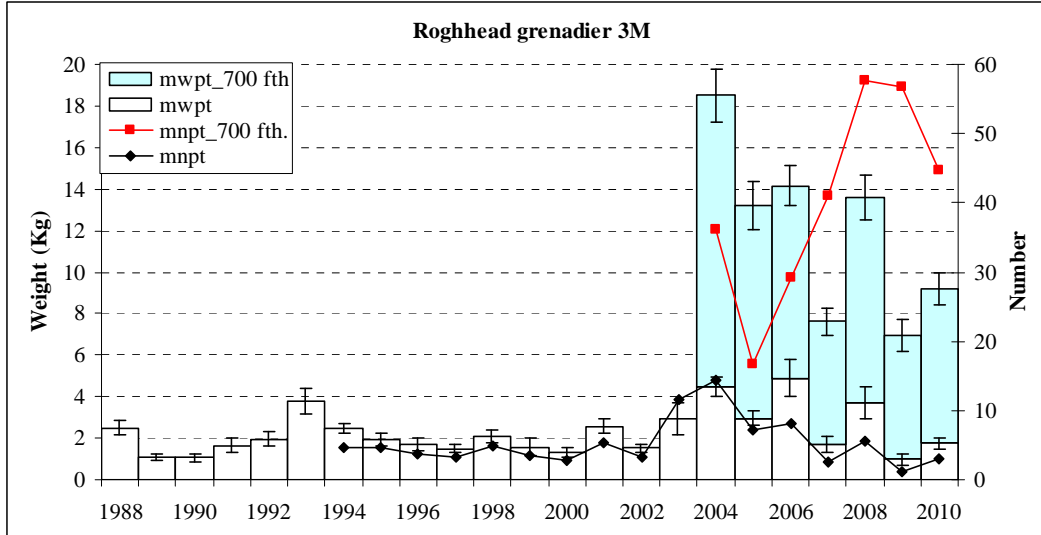


Figure 16. - Roughhead grenadier (*Macrourus berglax*) mean catches (kg) \pm S.E. and mean number per standard tow 1988-2010.

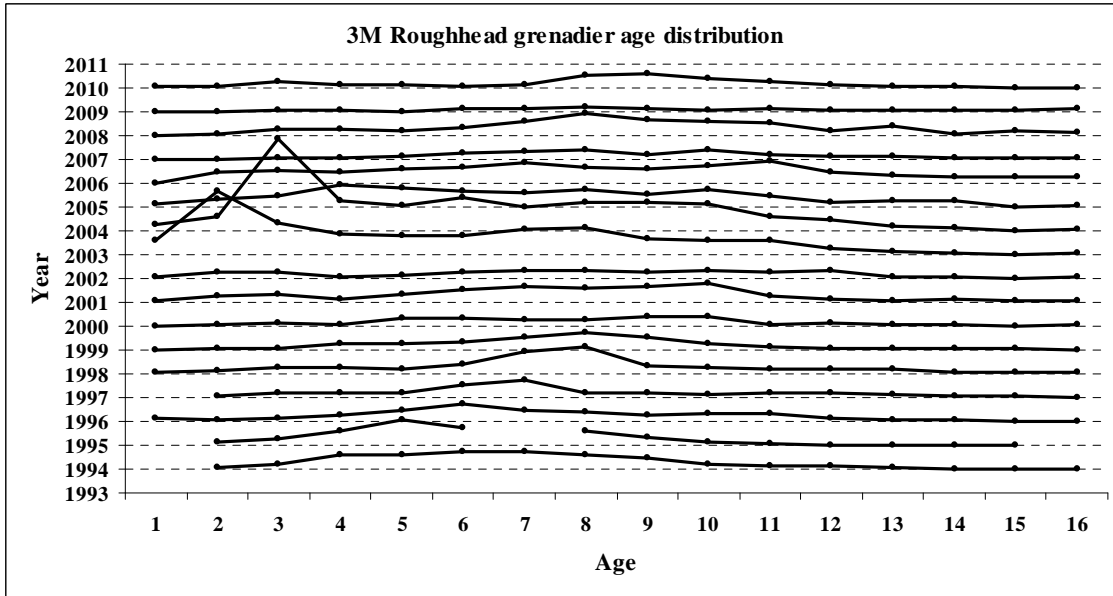


Figure 17.- Roughhead grenadier age distribution on Flemish Cap in depths < 400 fathoms, NAFO Div. 3M: 1988-2010.