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Results from Bottom Trawl Survey on Flemish Cap of June-July 2021

by

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Abstract

A stratified random bottom trawl survey on Flemish Cap was carried out from 12 July to 9 August 2021. Following the same procedures as in previous years, the area surveyed extends up to depths of 800 fathoms (1460 meters) and 181 fishing stations were planned. The survey was carried out by the R/V *Vizconde de Eza* with the usual survey gear (*Lofoten*). A total of 181 valid hauls were made, 120 up to 730 meters depth and 61 up to 1460 meters. Survey results are presented, including abundance indices of the main commercial species and age distributions for cod, redfish, American plaice, Greenland halibut, roughhead grenadier, squid and shrimp. 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 1460 m.).

Introduction

The survey on Flemish Cap was carried out on board R/V *Vizconde de Eza* in 2021. A total of 181 valid bottom trawls were made up to a depth of 1460 m (800 fathoms) (Figure 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. In this Figure we can observe the closed areas for Vulnerable Marine Ecosystems. Although the closed areas are tried to be avoided during the survey, sometimes this is impossible due to the lack of trawled zones. Take into account that new closed areas were set in September 2021 by the NAFO Commission (Areas 7a, 11a, 14a and 14b). A synoptic sheet of the survey with vessel and gear characteristics is shown in Table 1. This was the 34th survey of the series initiated by the EU in 1988. All years, the survey has had a stratified random design following NAFO specifications (Doubleday, 1981). In 2021, the survey was slightly later in July than usual due to the COVID restrictions. Dates, vessel, number of valid tows (including the number of valid tows until 700 m in brackets since 2002) and dates of the survey each year were:



Year	Vessel	Valid tows	Dates	Year	Vessel	Valid tows	Dates
1988	Cornide de Saavedra	115	08/07 – 22/07	2005	Vizconde de Eza	176 (117)	01/07 – 21/08
1989	Cyros	116	12/07 – 01/08	2006	Vizconde de Eza	179 (115)	01/07 – 26/07
1990	Ignat Pavlyuchenkov	113	18/07 – 06/08	2007	Vizconde de Eza	174 (117)	23/06 – 19/07
1991	Cornide de Saavedra	117	24/06 – 11/07	2008	Vizconde de Eza	179 (111)	23/06 – 19/07
1992	Cornide de Saavedra	117	29/06 – 18/07	2009	Vizconde de Eza	178 (119)	23/06 – 20/07
1993	Cornide de Saavedra	101	23/06 – 08/07	2010	Vizconde de Eza	153 (97)	22/06 – 21/07
1994	Cornide de Saavedra	116	06/07 – 23/07	2011	Vizconde de Eza	128 (79)	29/06 – 09/08
1995	Cornide de Saavedra	121	02/07 – 19/07	2012	Vizconde de Eza	174(118)	26/06 – 24/07
1996	Cornide de Saavedra	117	28/06 – 14/07	2013	Vizconde de Eza	181(120)	26/06 – 23/07
1997	Cornide de Saavedra	117	16/07 – 01/08	2014	Vizconde de Eza	181(120)	25/06 – 23/07
1998	Cornide de Saavedra	119	17/07 – 02/08	2015	Vizconde de Eza	181(120)	23/06 – 22/07
1999	Cornide de Saavedra	117	02/07 – 20/07	2016	Vizconde de Eza	181(120)	23/06 – 22/07
2000	Cornide de Saavedra	120	10/07 – 28/07	2017	Vizconde de Eza	181(120)	16/06 – 15/07
2001	Cornide de Saavedra	120	03/07 – 20/07	2018	Vizconde de Eza	181(120)	26/06 – 24/07
2002	Cornide de Saavedra	120	30/06 – 17/07	2019	Vizconde de Eza	180(120)	01/07 – 27/07
2003	Vizconde de Eza	177 (114)	02/06 – 02/07	2020	Vizconde de Eza	181(120)	30/06 – 29/07
	Cornide de Saavedra	50**	07/06 – 17/06	2021	Vizconde de Eza	181(120)	12/07 – 09/08
2004	Vizconde de Eza	177 (124)	25/06 – 02/08				
	Cornide de Saavedra	61**	23/07 – 02/08				

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

** calibration tows

Material and Methods

As last years, 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 (Vazquez *et al.*, 2014).

Results

Biomass of the main species during the survey estimated by swept area method (tons) are:

	Survey	Cod	American plaice	Redfish	Greenland halibut	Roughhead grenadier	Squid	Shrimp
120-730 m	1988	40839	16046	188331	6926	2009	6	5615
	1989	114050	14047	162535	4472	871	9	2252
	1990	59362	11983	126757	5799	852	2107	3405
	1991	40248	10087	76955	8169	1335	1483	11352
	1992	26719	8656	130209	8728	1577	83	24508
	1993	60963	7861	72608	6529	3021	1	11673
	1994	26463	8227	162525	8037	1975	269	3879
	1995	9695	6785	87644	10875	1558	1	7276
	1996	9013	4098	119662	11594	1362	113	10461
	1997	9966	3026	165816	16098	1197	81	7449
	1998	4986	3437	70832	24229	1691	92	39367
	1999	2854	2585	98651	21207	1250	22	24692
	2000	3062	1606	177990	16959	1047	3	19003
	2001	2695	2404	77345	13872	2079	10	27204
	2002	2496	2049	121312	12100	1211	8	36510
	2003	1593	2286	93816	6214	2348	222	21087
	2004	4071	3525	250605	12292	3597	470	20182
	2005	5242	2760	451215	11698	2387	79	30675
	2006	12505	1691	766922	11708	3933	3541	16235
	2007	23886	1053	464628	13040	1367	411	17046
	2008	43675	1766	566126	11997	2961	5137	11092
2009	75228	1442	358479	7777	782	1688	2797	
2010	69295	2446	212211	6657	1402	43	4894	
2011	106151	4084	197031	6765	888	89	1621	
2012	113227	4491	305946	4291	612	38	1041	
2013	72289	3698	219737	2799	807		844	
2014	159939	3800	179925	5168	399	3	900	
2015	114807	3821	158001	6577	478		1551	
2016	80583	4325	171199	6139	373	3	2478	
2017	89414	7475	163262	7632	616	2350	2884	
2018	75795	6109	100483	5578	625	49	4394	
2019	42460	7654	143297	5496	590	363	9273	
2020	67442	7752	227261	6649	624	142	6734	
2021	51501	9372	148914	5872	699	329	2101	
120-1460 m	2004	4071	3525	250638	28676	17184	479	20195
	2005	5242	2760	453086	20460	14253	83	31186
	2006	12505	1691	766952	23475	12109	3551	15250
	2007	23886	1053	464660	30731	7807	411	17120

2008	43675	1766	566647	39614	12139	5144	11141
2009	75228	1442	358521	36047	7304	1694	2792
2010	69295	2446	212282	27096	9091	43	4896
2011	106151	4084	196574	32309	8997	90	1733
2012	113227	4491	305974	23505	5476	41	1063
2013	72289	3698	219767	23391	4298		855
2014	159939	3800	179956	29288	4111	3	901
2015	114807	3821	158055	58180	3702		1551
2016	80583	4325	171219	34642	3836	4	2479
2017	89414	7475	163273	52237	5141	2366	2897
2018	75795	6109	100512	36482	4375	52	4404
2019	42460	7654	143390	20673	6500	365	9325
2020	67442	7752	227332	16194	4037	142	6869
2021	51501	9372	148929	19969	3964	351	2246

Values for surveys before 2003, when R/V *Cornide de Saavedra* was used, are transformed to their equivalences for R/V *Vizconde de Eza* following the accepted calibration among the two vessels (González Troncoso and Casas, 2005). From 2004 onwards, abundances are calculated for 19 shallowest strata covering the bank up to 730 m deep, as it was done in previous years, and for 32 strata up to 1460 m deep.

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. The composition of the species in 2021 is similar to that found in the beginning of the series: cod at high levels, shrimp residual, redfish fluctuating around 150-300 kt. and grenadiers and Greenland halibut (<730m) at low levels. Greenland halibut biomass index (<1400m) increased in 2017 next to historic maximums, decreasing since then. Everything seems to point to a return to the situation found at the beginning of the EU survey series, and prior to the changes induced by the collapse of cod in the late 90's. American plaice biomass has increased since 2014 and it seems to show signs of recovery, being the 2021 value the highest of the series since 1991.

Cod

Mean catch per haul and biomass by strata with standard errors 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		2003	1,593		-
1984		31,210		2004	4,071		
1985		28,070		2005	5,242		
1986		26,060		2006	12,505		
1987		10,150	21,600	2007	23,866		
1988	40,839	7,720	34,200	2008	43,675		
1989	114,050	36,520	78,300	2009	75,228		
1990	59,362	3,920	15,200	2010	69,295		
1991	40,248	6,740	8,200	2011	106,151		
1992	26,719	2,490	2,400	2012	113,227		
1993	60,963	8,990	9,700	2013	72,289		
1994	26,463	-	-	2014	159,939		
1995	9,695	8,260	-	2015	114,807		
1996	9,013	730	-	2016	80,583		
1997	9,966	-	-	2017	89,414		
1998	4,986	-	-	2018	75,795		
1999	2,854	-	-	2019	42,460		
2000	3,062	-	-	2020	67,442		
2001	2,695	784	-	2021	51,501		tons
2002	2,496	694	-				

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).

Table 4 shows the length distribution of this stock. Table 6 presents the 2021 ALKs, and Table 7 the abundance at age by stratum.

Distribution of survey catches in the last four surveys is presented in Figure 2. Evolution of biomass and abundance are illustrated in Figure 3. The abundance at age along the series is presented in Table 8 and Figure 5.

The 1992 to 2003 year-classes failed almost completely. The abundances of 2004-2008 years classes were higher than in previous 12 years. The abundance of the 2010 year-class was the highest of the series, and the 2009 and 2011 ones were also high. The 2012-2018 year-classes failed according to current results at age 1 and the 2019-2021 years classes seems to be better than in recent years but it remains still at low level (Figure 4). Two individuals of 6 and 7 cm appeared during the survey, corresponding to age 0.

After the historic maximum in biomass in 2014, the biomass has decreased successively and it is now slightly below the average of the whole period. The abundance had a peak in 2011 due to the very high recruitment, and since then has decreased, indicating an increase in older ages and a fail in recruitment. After a low biomass in 2019, in the level of the 2008 one, the biomass increased in 2020 but decreased again in 2021.

American plaice

Mean catch per haul and biomass by strata with standard errors are presented in Table 9. Survey biomass, as calculated by the swept area method, is compared with results of previous surveys in Table 11. This biomass is compared with Russian survey results in the following table:

Year	EU	Russia (1)	Year	EU	Russia (1)	Year	EU	Russia (1)
1983		8,900	1996	4,098		2009	1,442	
1984		7,500	1997	3,026		2010	2,446	
1985		7,800	1998	3,437		2011	4,084	
1986		20,200	1999	2,585		2012	4,491	
1987		9,300	2000	1,606		2013	3,698	
1988	16,046	6,500	2001	2,404		2014	3,800	
1989	14,047	5,000	2002	2,049		2015	3,821	
1990	11,983	1,200	2003	2,286	548	2016	4,325	
1991	10,087	14,400	2004	3,525	1,398	2017	7,475	
1992	8,656	1,200	2005	2,760		2018	6,109	
1993	7,861	2,700	2006	1,691		2019	7,654	
1994	8,227		2007	1,053		2020	7,752	
1995	6,785	ton	2008	1,766	ton	2021	9,372	ton

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

Table 10 shows the length distribution and Tables 12 and 13 the age-length key and the abundances at age by stratum respectively (no updated since 2020). Figure 5 shows the distribution of the survey catches in the last four surveys. The abundance at age along the series is shown in Table 14. Also, the evolution of survey biomass and abundance along the series is presented in Figure 6. Figure 7 shows the age distribution over the years.

Fish aged 6 or more roughly correspond with fishable biomass. Results indicate 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 2006 year-class is the more abundant since 1991, but its abundance is only intermediate. Recruitment for later year-classes seems to be weaker; too weak for a quick recovery of the stock. Figure 7 illustrates the lack of recruitment that occurred for many years, and how most recent year-classes are weaker than those at the beginning of the series. The biomass and abundance were more or less stable from 2011 to 2016, showing an upward trend since 2017 reaching in 2021 the maximum values since 1991.

The ALKs for American plaice since 2021 are not available yet due to lack of time, so the indices by age are presented only until year 2018. The length distribution doesn't indicate a change with regards to previous years.

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 has been 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 haul and biomass by strata with the standard errors are presented in Tables 15, 19, 23 and 27 for *Sebastes norvegicus*, *S. mentella*, *S. fasciatus* and the *juvenile* group respectively. The following table shows the total biomass (tons) by year in the traditional strata (<730 m.).

Year	<i>Sebastes</i>	<i>Sebastes spp.</i>			Total
	<i>norvegicus</i>	<i>mentella</i>	<i>fasciatus</i>	<i>juvenile</i>	
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
2011	29,056	103,678	59,753	4,543	197,030
2012	55,410	166,693	82,539	1,304	305,946
2013	32,016	102,500	84,801	420	219,737
2014	37,171	96,158	46,174	422	179,925
2015	30,672	45,668	80,494	1,167	158,001
2016	35,069	79,143	55,394	1,593	171,199
2017	23,371	92,136	47,521	234	163,262
2018	10,771	57,403	30,407	1,931	100,512
2019	22,588	49,464	43,222	28,023	143,297
2020	70,138	95,372	58,304	3,508	227,261
2021	15,723	78,212	51,733	3,246	148,914

Tables 16-18, 20-22, 24-26 show the age length key, length frequency and the abundance at age by stratum for the three species of redfish respectively. Catches per haul distributions and biomass of the three species and juveniles are presented in the Figure 8 and 9 respectively. Table 28 shows the length frequency of the juveniles. ALKs, and so the numbers at age, are not yet available for these species in 2021 due to lack of time.

Greenland halibut

Mean catch per standard haul and the estimated biomass by strata with their standard errors are presented in Table 29. These indices are compared with results of previous surveys in Table 30. The following table summarises the total biomass in tons by year in depths <730 m. (1988-2021) and in depths up to 1460 m. (2004-2021).

Year	EU < 730 m.	Year	EU < 730 m.	EU < 1460 m.
1988	6,926	2004	12,292	28,343
1989	4,472	2005	11,698	21,515
1990	5,799	2006	11,706	24,357
1991	8,169	2007	13,040	31,723
1992	8,728	2008	11,995	39,614
1993	6,529	2009	7,775	36,047
1994	8,037	2010	6,299	26,739
1995	10,875	2011	6,713	32,257
1996	11,594	2012	4,291	23,505
1997	16,098	2013	2,799	23,391
1998	24,229	2014	5,168	29,288
1999	21,207	2015	6,577	58,180
2000	16,959	2016	6,139	34,642
2001	13,872	2017	7,632	52,237
2002	12,100	2018	5,578	36,482
2003	6,214	2019	5,496	20,673
		2020	6,649	16,194
		2021	5,872	19,969

Age-length keys and length frequency are presented in Tables 31 and 32 respectively. Frequency at age by stratum for 2021 is presented. Catch per haul distribution for the last four surveys is presented in Figure 10. Figure 11 shows the estimated biomass with their standard error and numbers by year. The abundance at age along the series is shown in Table 34. Figure 12 shows the age distribution by year in the EU Flemish Cap surveys. The 2017 biomass and abundance indices until 1430 m are the second highest of the series, after the 2015 values. The 2020 biomass to 1400m is the lowest value in the historical series, since 2004. The 2017 age 1 numbers were the highest since 2004.

Roughhead grenadier (*Macrourus berglax*)

Mean catch per standard haul and estimated biomass by strata with their standard errors are presented in Table 35. These indices are compared with results of previous surveys in Table 36. The following table summarises the total biomass in tons by year:

Year	EU < 730 m.	Year	EU < 730 m.	EU < 1460 m.
1988	2,009	2004	3,597	17,185
1989	871	2005	2,387	12,560
1990	852	2006	3,933	11,336
1991	1,335	2007	1,367	7,271
1992	1,577	2008	2,961	12,138
1993	3,021	2009	781	7,303
1994	1,975	2010	1,403	9,092
1995	1,558	2011	729	8,800
1996	1,362	2012	612	5,477
1997	1,197	2013	807	4,298
1998	1,691	2014	399	4,111
1999	1,250	2015	478	3,702
2000	1,047	2016	373	3,836
2001	2,079	2017	616	5,141
2002	1,211	2018	625	4,375
2003	2,348	2019	590	6,500
		2020	624	4,037
		2021	699	3,964

Age-length keys and length frequency and are presented in Tables 37 and 38. Frequency at age by strata is presented in Table 39. Catch per haul distribution is presented in Figure 13. Figure 14 shows the estimated biomass with their standard error and numbers by year. The abundance at age along the series is shown in Table 40. Figure 15 shows the age distribution by year in the EU Flemish Cap surveys. Biomass and abundance have been stable in the last years at low levels.

Squid

Some indices of the squid (*Illex illecebrosus*) are presented. Total biomass and abundance are presented in Table 41. The biomass is presented by stratum and year. The 1988-2002 indices were transformed for the R/V *Cornide de Saavedra* to the R/V *Vizconde de Eza* level (González-Troncoso, 2016). Catch per haul distribution for the last four surveys is presented in Figure 16. The indices could be seen in Figure 17. No all the years squid is present in the survey, and the indices show a high variability.

Shrimp

Casas J.M. (2021) presented detailed results.

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Table 1. Technical data of the 2021 survey.

Procedure	Specification
Vessel	R/V <i>Vizconde de Eza</i>
GT	1 400 t
Power	1 800 HP
Mean trawling speed	3.0 -3.5 knots
Trawling time	30 minutes effective time
Fishing gear	type <i>Lofoten</i>
footrope / handrope	31.20 / 17.70 m
footgear	27 steel bobbins of 35 cm
vertical opening	3.0 m (MARPORT)
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, cephalopods, shrimp and invertebrates
Species for age determination	Cod, American plaice, redfish (<i>Sebastes sp.</i>), Greenland halibut and Roughhead grenadier (<i>Macrourus berglax</i>).

Table 2. Biomass (t.) for the most important species or groups of species in 1988-2021 surveys in depths lesser than 730 m.

Species	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
Rajidae	4495	1938	2823	4061	3780	6241	3506	2268	2051	1842	1978	1608	1150	2236	1544	4608	6241
<i>Synphobranchus</i> <i>sp.</i>	217	88	40	80	72	105	8	16	0	8	40	0	0	24	8	24	88
<i>Urophycis sp.</i>	643	169	169	257	72	169	217	80	80	32	225	249	169	394	129	547	667
<i>Antimora sp.</i>	394	306	281	563	724	820	796	193	185	233	491	290	265	667	346	306	1158
Macrouridae	3088	1456	1222	2252	2589	6498	3233	2606	2340	2292	2831	2332	1809	3080	2043	3691	4914
<i>Notacanthus sp.</i>	499	410	64	474	450	740	458	346	177	290	169	64	97	105	64	24	145
<i>Illex sp.</i>	8	8	1649	1158	64	0	209	0	88	64	72	16	0	8	8	225	474
Anarhichadidae	7994	7487	8122	10101	9095	14355	15642	19220	20563	14033	10985	5581	4471	5863	5227	5983	10591
Witch flounder	909	338	418	772	820	1045	788	708	507	322	241	378	410	458	209	844	1568
Greenland halibut	6924	4471	5798	8171	8725	6530	8034	10873	11596	16100	24230	21207	16960	13872	12103	6216	12288
Zoarcidae	563	1142	1206	1978	1359	3474	1874	2179	1705	1729	2059	893	780	1246	812	2067	3683
Cod	40837	0	59365	40250	26715	60966	26466	9699	9015	9964	4986	2855	3064	2694	2493	1592	4069
American plaice	16044	14049	11982	10085	8653	7865	8227	6787	4101	3024	3434	2581	1608	2405	2051	2284	3522
Redfish	3	5	7	76953	6	72610	7	87641	4	6	70833	98650	1	77347	2	93817	2
Shrimp*	5742	2300	3490	11661	25155	12087	3981	7503	10905	7704	41971	25734	19719	28316	40177	21512	20129
Total	27732	31095	22453	16948	21890	19350	23644	15051	18366	22403	16565	16305	23008	14016	18945	14939	32286
	5	6	0	3	9	4	0	2	9	9	5	8	7	2	9	4	6

Species	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Rajidae	4238	3506	2179	6289	2244	3471	2188	1658	743	680	836	1073	1365	775	1592	1650	2063
<i>Synaphobranchus</i> <i>sp.</i>	72	32	64	40	24	14	2	20	40	14	9	23	10	25	19	11	890
<i>Urophycis sp.</i>	740	611	249	547	217	685	682	380	332	258	145	113	107	130	199	305	663
<i>Antimora sp.</i>	1110	474	587	893	499	670	342	727	655	649	630	748	520	442	455	370	7634
Macrouridae	3353	5026	2364	3957	1166	1926	561	1190	1253	980	843	655	848	855	1065	1227	12363
<i>Notacanthus sp.</i>	64	145	64	88	32	21	12	69	68	40	17	69	55	109	91	83	650
<i>Illex sp.</i>	80	3546	410	5139	1737	43	89	0	0	0	0	3	2350	49	363	142	351
Anarhichadidae	9570	9272	8195	9867	4600	4256	3739	5073	3893	4775	5402	5371	6182	6333	8802	9121	5214
Witch flounder	1777	893	595	2220	764	1836	1458	2283	940	1810	2163	2126	3134	2465	3380	4291	3228
Greenland halibut	11701	11709	13044	11999	7777	6299	6481	4291	2884	5168	6577	6139	7633	5578	5277	6649	19969
Zoarcidae	3080	1801	354	458	56	75	20	1	6	0	1	5	1	0	30	58	75
Cod	5243	12505	23884	43676	75232	69295	10615	11322	15993	11480	9	7	80583	89414	75621	42460	67442
American plaice	2758	1689	1053	1769	1440	2446	4084	4491	3632	3800	3821	4325	7475	6105	7654	7752	9372
Redfish	45304	76692	46462	56664	35847	21221	19649	30594	21972	17992	15800	17119	16326	10048	14329	22726	14892
Shrimp*	1	4	1	9	6	2	3	7	9	5	1	8	2	4	7	1	9
	30672	16237	17049	11066	2799	4889	1593	1055	844	900	1551	2478	2885	4395	9273	6734	2246
Total	52918	84525	53471	66465	45706	31780	32088	44866	31915	36545	30044	28326	32519	21242	23641	34303	29859
	1	2	4	5	2	5	6	1	7	9	3	9	0	1	7	2	3

*) 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 haul and the estimated biomass by strata and its standard error in the 2021 survey.

stratum	area sq. miles	tow number	catch (kg)		Biomass (t.)	
			mean	s. e.	value	s.e.
1	342	4	151.34	80.03	3943	2085
2	838	10	139.83	55.02	8928	3513
3	628	7	70.84	11.55	3389	553
4	348	4	53.90	26.62	1429	706
5	703	8	33.92	7.51	1817	402
6	496	6	135.45	35.72	5119	1350
7	822	9	80.55	37.36	5045	2340
8	646	7	114.96	61.37	5658	3020
9	314	3	22.16	8.30	530	199
10	951	11	50.93	9.73	3690	705
11	806	9	111.07	45.61	6821	2800
12	670	8	29.94	6.32	1529	322
13	249	3	72.87	58.29	1382	1106
14	602	7	16.84	5.48	772	251
15	666	8	24.22	8.47	1229	429
16	634	7	0.35	0.35	17	17
17	216	2				
18	210	2				
19	414	5	6.48	6.48	204	204
Total < 730 m.	10555	120	64.03	8.26	51501	6639
Total < 1460 m.	16070	181	42.07	5.43	51501	6639

Table 4. Cod (*Gadus morhua*) length distribution ('000) in the 2021 survey.

length	number	length	number	length	number	length	number
6-8	14	39-41	2630	72-74	707	105-7	41
9-11	15	42-44	8330	75-77	512	108-10	35
12-14	885	45-47	10854	78-80	397	111-13	22
15-17	8972	48-50	5101	81-83	347	114-16	8
18-20	9287	51-53	1161	84-86	253	117-19	7
21-23	1310	54-56	639	87-89	171	120-22	7
24-26	682	57-59	790	90-92	120	123-25	0
27-29	3297	60-62	991	93-95	91	126-28	8
30-32	3677	63-65	969	96-98	72	129-31	0
33-35	839	66-68	804	99-1	36	132-34	7
36-38	373	69-71	661	102-4	22	total	65144

Table 5. Cod (*Gadus morhua*) biomass (t.) by strata in 1988-2021 surveys.

strata	year																		
	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004		
1	1345	649	767	5585	76	516	2165	1563	1006	243	125	99	250	86	477	173	1996		
2	10150	10323	2065	5486	5150	9044	8186	3040	3991	2049	1899	1502	740	491	736	102	1668		
3	4471	10276	2391	2459	8473	8435	6092	1146	1054	1132	703	145	360	230	451	90	9		
4	3130	4843	2446	2900	3443	14171	1885	746	1068	857	140	25	443	488	66	136	168		
5	2130	10702	8447	10651	4570	6824	924	1274	936	1149	976	256	425	260	146	303	19		
6	3230	6789	3286	1531	952	4220	1412	1310	620	1074	613	375	511	749	525	24	155		
7	2224	16025	4385	2538	945	6153	857	122	55	1067	78	52	5	12	24	107	18		
8	8931	16434	15973	5107	2349	7964	3615	349	93	1610	77	23	74	123	37	111	5		
9	184	5261	6340	188	143	998	239	9	103	174		20	41		14	376			
10	1338	4898	4193	1558	327	936	506	58	46	301	199	102	107	81	2	24			
11	2505	13219	3859	1787	224	1678	582	78	41	310	176	255	106	175	18	58	33		
12	335	2469	1587	126		24											71		
13	9	2534	734	93															
14	107	1121	545	131	67														
15	748	8436	2344	108													18		
16		66																	
17		5																	
18	2																		
19																			
total	40839	114050	59362	40248	26719	60963	26463	9695	9013	9966	4986	2854	3062	2695	2496	1593	4071		
s.e.	5784	12205	8225	6704	5837	17397	7367	2070	1459	1725	646	451	593	380	398	273	780		

s.e.: standard error

strata	year																
	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
1	1091	2433	4420	4224	2253	11815	4694	1567	1931	4688	11089	3195	5589	15884	11385	959	3943
2	1888	4145	1775	5346	6627	23368	22989	13861	10230	27320	1896	8348	18068	15592	3691	7608	8928
3	1791	1948	11466	4129	7630	4512	16922	17743	12291	22585	5572	21702	10439	8556	5364	3002	3389
4	152	466	1132	771	5190	1716	10114	2903	7106	3081	2046	11268	5305	2466	2389	971	1429
5	30	644	548	1129	6947	3600	10947	11639	5528	5090	2051	3499	11273	4189	5000	3639	1817
6	206	1224	3214	12487	10734	2303	9510	9991	3849	11494	7413	2298	8027	8814	4312	2145	5119
7		473	140	4692	12659	4667	2586	6824	5872	37607	5914	7099	8053	4630	2292	38851	5045
8		347	475	3471	2814	4204	10921	7739	4641	9335	5732	5284	2708	2260	1342	2265	5658
9		64	151	81	503	2048	1997	5963	970	9040	256	9058	2334	2670	653	1086	530
10	28	304	246	2625	5071	4275	5247	16988	5153	6655	9852	1676	3217	1005	1780	981	3690
11	56	381	272	3699	4336	4458	4557	5701	4205	9585	1490	2457	7350	1929	1778	1747	6821
12				42	339	588	1135	2538	1323	927	747	974	1974	1475	1334	2319	1529
13				15	135	124	419	875	940	529	311	846	213	513	120	17	1382
14		76		160	9795	1056	3186	3663	6094	8331	3093	1092	1297	3355	175	220	772
15			47	805	195	475	926	5133	1961	3532	532	1787	3567	2375	815	1630	1229
16									82	142	93						17
17																	
18								100							80		
19						88			113		17				32		204
total	5242	12505	23886	43675	75228	69295	10615	1113227	72289	159939	114807	80583	89414	75795	42460	67442	51501
s.e.	813	980	4526	5507	8109	16269	11805	12293	8904	25425	19966	14715	11056	16599	6846	13801	6639

s.e.: standard error

Table 6. Cod (*Gadus morhua*) age-length key in 2021.

Length (cm)	Age																	
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16+	
6-8	2																	2
9-11		1																1
12-14		34																34
15-17		101	1															102
18-20		86	9															95
21-23		29	21															50
24-26		1	46	1														48
27-29			78	2														80
30-32			84	8	4													96
33-35			26	16	9													51
36-38				18	6													24
39-41				45	21													66
42-44				52	66	1												119
45-47				31	95	6												132
48-50				6	74	12												92
51-53					35	16												51
54-56					28	18	1											47
57-59					10	41	4											55
60-62					2	40	11	4	1									58
63-65						31	17	10	2									60
66-68						21	15	13	12	1								62
69-71						7	18	18	11	2	3	2						61
72-74							1	22	26	7	6	2						64
75-77							1	13	16	8	11	4						53
78-80								7	14	4	15	6	2					48
81-83								4	7	1	11	13	2					38
84-86								1	8	1	7	12	2					31
87-89									2	3	2	11	6					24
90-92									1	2	2	7	5					17
93-95									1	1	3	4	2	1				12
96-98											2	6	1					9
99-1												1	2	2				5
102-4												2				1		3
105-7												2	3					5
108-10											1	2		1	1			5
111-13												2			1			3
114-16												1					1	
117-19														1				1
120-22												1						1
123-25																		
126-28															1			1
129-31																		
132-34																1		1
TOTAL	2	252	265	179	350	193	68	92	101	30	63	78	25	4	5	0	1	1708

Table 7. Cod (*Gadus morhua*) frequency ('000) at age and stratum in the 2021 survey.

Age	Strata																	Mean		
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	19	total	Weight (g)	Length (cm)
0	0	0	7	0	7	0	0	0	0	0	0	0	0	0	0	0	0	14	4	8
1	540	5460	3400	1720	2540	4340	520	40	0	120	490	0	0	0	0	0	0	19180	53	19
2	90	1450	2390	1040	880	1500	340	190	0	480	550	0	0	0	0	0	0	8910	212	30
3	1020	1730	920	230	280	1460	580	1440	10	200	1390	0	0	0	0	0	0	9280	717	44
4	2150	4320	1210	460	450	2860	1390	2850	30	410	2900	10	0	10	0	0	0	19060	900	47
5	330	840	170	140	90	460	390	600	50	120	500	70	50	40	30	0	0	3900	1683	58
6	60	160	50	40	20	60	120	110	30	50	130	50	20	30	20	0	0	960	2540	66
7	40	120	30	40	40	70	130	80	30	110	150	80	70	60	30	0	0	1070	3256	72
8	50	80	40	30	50	40	140	70	20	150	130	70	60	50	50	0	10	1030	3858	76
9	20	30	10	10	20	10	30	20	10	40	40	20	20	10	20	0	0	290	4320	79
10	20	60	20	10	20	20	50	20	10	80	80	40	50	20	50	0	0	550	4970	82
11	30	80	30	10	40	10	60	20	0	110	50	60	40	30	40	0	10	630	6539	89
12	20	40	10	0	20	0	10	0	0	40	10	10	10	0	10	0	10	200	7221	93
13	0	10	0	0	0	0	0	10	0	0	0	0	0	0	0	0	0	30	9404	101
14	0	10	10	0	0	0	10	0	0	10	0	0	0	0	0	0	0	40	16529	121
15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
16+	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	10	10540	106
Sets	4	10	7	4	8	6	9	7	3	11	9	0	0	6	7	1	1	104	825	
n	4360	14390	8280	3720	4440	10840	3790	5460	190	1940	6450	400	330	250	260	10	30	65154	5890	39

Table 8. Cod (*Gadus morhua*) abundance ('000) at age in 1988-2021 surveys.

age	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	4868	19604	23031	29032	71533	4075	3017	1425	36	37	23	5	178	473	0	684
2	79905	10800	12348	26220	41923	138357	4130	11901	3121	150	83	84	16	1990	1330	54
3	49496	91303	5121	16903	5578	31096	27756	1338	6659	3478	95	116	327	13	641	628
4	13448	54613	16952	2125	2385	1099	5097	3892	892	4803	1256	117	198	122	29	134
5	1457	20424	15834	6757	385	1317	130	928	2407	391	1572	717	96	79	70	22
6	211	1336	4492	1731	1398	173	67	33	192	952	78	444	446	15	33	42
7	225	143	340	299	244	489	7	23	8	21	146	19	172	142	26	7
8	72	126	146	68	14	87	111	0	5	0	0	5	11	99	96	8
9	0	6	77	32	0	0	0	21	0	0	6	0	17	6	30	39
10	0	7	25	4	0	0	5	5	0	0	0	0	0	6	0	24
11	0	0	0	10	8	0	0	0	0	0	0	0	0	6	5	0
12	0	0	0	0	0	0	0	0	0	4	0	0	5	0	0	0
13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14	0	0	0	0	0	0	0	0	0	0	0	0	5	0	0	0
15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
19	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	149683	198363	57637	183181	123468	176693	40319	19567	13320	9837	3259	1507	1470	2951	2261	1642

age	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	14
1	14	8069	19709	3917	6096	5139	66370	347674	¹⁰³⁴⁹ ₄	5525	7282	1141	56	2010	36611900	7137	19195		
2	3380	16	3886	11620	16671	7479	27689	142999	¹²⁸⁰⁸ ₇	67521	2372	12952	4485	314	4303	1740	4733	8871	
3	25	1118	62	5022	12433	16150	8654	16993	10942	32339	48564	7250	14356	6516	271	5210	25203	9272	
4	600	78	1481	21	4530	14310	7633	6309	11721	4776	43168	25614	2230	16645	6114	31013	495	19074	
5	168	709	85	1138	72	4154	4911	7739	4967	4185	17861	14107	14540	3267	13117	3310	5678	3913	
6	5	136	592	58	946	26	1780	3089	4781	2782	6842	21854	12375	15842	3370	5700	4109	960	
7	10		115	425	56	1091	8	1191	1630	1807	3447	3434	4814	8519	7074	400	3336	1061	
8	3	17	7	74	231	0	442	0	832	963	1931	1426	1157	2765	3948	1460	687	1035	
9	5	16	0	13	76	335	46	215	24	278	1551	762	522	789	1030	1960	631	289	
10	15	8	7	20	0	0	251	0	93	40	600	366	303	345	272	830	938	558	
11	0	0	14	0	14	0	26	89	30	29	79	194	145	137	182	130	566	636	
12	0	0	0	0	0	14	0	0	101	32	54	14	28	53	63	30	126	195	
13	0	0	7	0	0	0	0	0	0	5	8	21	20	27	13	10	54	31	
14	0	0	0	0	0	0	0	0	17	0	0	21	0	6	0	10	14	37	
15	0	0	0	0	0	0	0	0	0	0	0	0	0	7	0	29	0		
16	0	0	0	0	0	0	0	0	0	0	0	7	0	0	6	0	0	7	
17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8	0	0	0	
18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8	0	
19	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	10	0	0	
Total	422610	16625965	22308	41124	48697	117810	526300	266720	120280	133760	89164	55032	57241	40139	33002	66744	65149		

Table 9. American plaice (*Hippoglossoides platessoides*) mean catch per haul and the estimated biomass by stratum, and their standard error in the 2021 survey.

stratum	area sq. miles	tow number	catch (kg)		Biomass (t.)	
			mean	s. e.	value	s.e.
1	342	4	60.76	32.83	1583	855
2	838	10	56.44	14.60	3603	932
3	628	7	20.53	4.92	982	235
4	348	4	22.49	15.47	596	410
5	703	8	8.35	2.31	447	124
6	496	6	14.14	2.28	534	86
7	822	9	6.69	1.17	419	73
8	646	7	5.97	2.78	293	137
9	314	3				
10	951	11	3.17	1.00	230	72
11	806	9	10.87	2.92	667	179
12	670	8	0.14	0.14	7	7
13	249	3	0.23	0.23	4	4
14	602	7				
15	666	8	0.12	0.12	6	6
16	634	7				
17	216	2				
18	210	2				
19	414	5				
Total < 730 m.	10555	120	11.66	1.72	9372	1382
Total < 1460 m.	16070	181	7.65	1.12	9372	1382

Table 10. American plaice (*Hippoglossoides platessoides*) length frequency ('000) in the 2021 survey.

<u>length</u>	<u>male</u>	<u>female</u>	<u>length</u>	<u>male</u>	<u>female</u>	<u>length</u>	<u>male</u>	<u>female</u>
12-13	7	27	32-33	43	91	52-53	28	450
14-15			34-35	100	44	54-55	7	510
16-17	15		36-37	204	15	56-57		382
18-19	21	15	38-39	279	35	58-59		141
20-21	42	56	40-41	563	28	60-61		35
22-23	36	55	42-43	970	98	62-63		29
24-25	55	7	44-45	1190	297	64-65		7
26-27	36	7	46-47	761	414			
28-29	99	36	48-49	242	630			
30-31	71	98	50-51	96	440	<u>total</u>	<u>4865</u>	<u>3947</u>

Table 11. American plaice (*Hippoglossoides platessoides*) survey biomass (t) by strata in 1988-2021.

stratum	year															
	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
1	1306	1000	505	1078	709	1079	661	2230	1462	381	156	372	345	1043	141	1292
2	2845	3602	1375	2663	1714	1267	1199	1335	943	740	1587	1810	976	835	1262	713
3	1367	1118	1668	1247	631	444	325	252	168	495	284	97	21	93	75	17
4	2199	461	817	320	557	572	853	489	268	203	343	53	100	85		128
5	2599	3093	1830	1407	837	1291	1230	549	500	619	744	73	56	112	189	82
6	479	1130	954	501	601	305	808	123	32	13	35	40	25	37	63	29
7	1174	531	837	389	639	319	316	249	72	83	47	19	15	28	52	30
8	417	164	263	251	727	487	171	132	56	123	165	3		45	43	14
9	103	163	343		373	205	20	500	55	36					1	9
10	2323	1491	2000	1308	1406	1459	2236	708	415	287	36	72	45	95	36	54
11	1186	1168	1316	401	372	292	303	109	68	32	29	37	23	27	59	29
12	9	19	45	17	11	15	33	12	32	7				4		11
13	3		20					3								
14	8	8	7	389	29		24	15	4		4	9				
15	23	99	3	97	37	109	40	68	23	7	7					6
16	5			4	9	12	5									
17																
18																
19				15	4	5	3	11								
total	16046	14047	11983	10087	8656	7861	8227	6785	4098	3026	3437	2585	1606	2404	2049	2286
s.e.	1845	2048	1276	1180	954	1040	1373	1083	912	708	751	869	332	429	729	748

stratum	year																	
	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
1	1507	1038	714	284	144	548	716	693	462	329	181	410	219	1014	764	945	1360	1583
2	768	796	354	209	513	370	1084	1141	1272	1202	1872	1248	1307	4379	1807	831	1793	3603
3	427	101	74	101	147	74	103	364	468	266	223	462	488	410	534	1042	436	982
4	395	359	109	153	440	36	91	1201	749	671	258	376	178	342	285	801	571	596
5	72	45	63	81	88	72	200	190	716	267	328	443	592	277	421	1602	1107	447
6	26	71	61	99	37	57	34	160	185	341	187	309	282	314	751	805	680	534
7	84	31	37	20	47	32	28	160	156	166	208	117	253	215	389	289	495	419
8	55	175	163	58	128	47	49	65	187	156	249	220	346	114	241	206	119	293
9	77	18				77			30	25	0	2	12	2		121	35	
10	45	87	97	24	163	54	115	35	123	153	105	86	325	190	403	336	482	230
11	69	35	19	22	50	64	26	33	121	121	185	124	308	188	397	559	462	667
12						11			11	0				10	16	18	128	7
13													2			20		4
14								32				3	3	16	39	28	13	
15		4		3	7	1		10	13			22	10	4	51	52	72	6
16																		
17																		
18																		
19																		
total	3525	2760	1691	1053	1766	1442	2446	4084	4491	3698	3800	3821	4325	7475	6109	7654	7752	9372
s.e.	740	684	342	159	300	327	526	780	534	439	671	556	481	1547	558	852	987	1382

Table 12a. American plaice (*Hippoglossoides platessoides*) age-length key in 2019.**MALE**

Length cm	age																total
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16+	
14-15	1																1
16-17																	
18-19		2															2
20-21		2															2
22-23		1															1
24-25																	
26-27		3	1														4
28-29		2	7														9
30-31			6	1													7
32-33			3	4													7
34-35			4	7	1												12
36-37				11	10	6	1										28
38-39				2	7	18	2	1									30
40-41					2	7	9	4	1		3						26
42-43							5	8	4	4	1	2	4	1			29
44-45								3	4	2	4	6	4	3	1	1	28
46-47								1	1	2	3	3	2	3		1	16
48-49												1	1	2			4
50-51											1				1	1	3
total	1	10	21	25	20	31	17	17	10	8	12	12	11	9	2	3	209

FEMALE

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																	
16-17																	
18-19		1															1
20-21		1															1
22-23		4	3														7
24-25																	
26-27		1	2														3
28-29			3	1													4
30-31			8	7													15
32-33			3	9													12
34-35				8	1												9
36-37			2	10	3												15
38-39				14	27	6											47
40-41				1	8	18	8	1									36
42-43					1	12	13	5	1								32
44-45					1	17	19	5									42
46-47					1	8	21	21	5	1			1				58
48-49						1	10	12	7	2	3	2					37
50-51						1	6	11	3	2	4	9	2	2	1		41
52-53							2	7	2	2	11	9	12	3			48
54-55							1	1	1	2	4	18	11	9	1	3	51
56-57								1		2	8	11	3	1	1	3	30
58-59										2	3	2	4	1		3	15
60-61											1		3		1	5	10
62-63																3	3
64-65														1		1	2
66-67																1	1
total	1	7	21	50	42	63	80	64	19	13	34	51	36	17	4	19	521

Table 12b. American plaice (*Hippoglossoides platessoides*) age-length key in 2020.
NOT YET AVAILABLE

MALE

FEMALE

Table 12c. American plaice (*Hippoglossoides platessoides*) age-length key in 2021.
NOT YET AVAILABLE

MALE

FEMALE

Table 13a. American plaice (*Hippoglossoides platessoides*) frequency at age in the 2019 survey.

Age	Strata															Total	Mean	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15		Weight (g)	Length (cm)
1			8			7					7					22	15	12
2		4	25	26	10	23	9			23	16					137	121	23
3	3	20	174	63	31	73	36	8		17	24			2	6	458	289	31
4	8	67	239	94	102	171	70	59	8	49	40			5	7	918	443	35
5	15	40	189	79	90	124	42	44	13	40	35			3	6	719	569	38
6	44	67	231	109	152	115	64	55	24	80	73	3		6	8	1032	707	41
7	79	86	118	88	174	89	55	36	24	69	72	4	2	6	9	911	932	44
8	117	93	81	59	169	77	30	18	25	49	57	3	3	7	7	794	1076	46
9	82	47	21	16	56	27	9	4	9	16	22	1	2	3	3	318	1067	46
10	68	37	15	15	43	19	5	2	6	9	15		1	3	2	240	1265	48
11	111	71	38	35	105	44	13	5	5	15	40	1	2	2	2	488	1442	50
12	141	83	51	59	151	66	9	6	8	22	50	2	2	1	3	652	1512	51
13	121	70	36	48	112	42	10	6	5	14	31		2	3	2	504	1511	51
14	101	53	14	22	54	24	4	2	2	7	18			1	2	307	1410	50
15	18	15	5	7	10	7	1		1	2	10					75	1565	51
16+	38	28	34	28	36	18	6	2	0	2	19	0	0	0	0	212	2090	56
Sets	4	10	7	3	8	6	8	7	2	11	8	1	1	3	6	85		
n	946	781	1279	748	1295	926	363	247	130	414	529	14	14	42	57	7787	961	43

Table 13b. American plaice (*Hippoglossoides platessoides*) frequency at age in the 2020 survey.
NOT YET AVAILABLE

Table 13c. American plaice (*Hippoglossoides platessoides*) frequency at age in the 2021 survey.
NOT YET AVAILABLE

Table 14. American plaice (*Hippoglossoides platessoides*) abundance ('000) at age in 1988-2021 surveys. 2020 AND 2021 NOT YET AVAILABLE.

age	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
1	0	40	8	40	0	0	0	0	8	8	0	8	16	0	0	8
2	402	563	426	354	852	8	40	32	32	16	24	0	24	40	0	8
3	1882	8364	917	1206	796	1544	48	113	121	113	32	24	8	48	32	32
4	1311	1874	8372	2171	1070	1086	2131	740	257	24	48	64	80	56	64	97
5	4230	4367	1126	5348	1938	780	1037	2131	587	121	72	80	105	105	16	80
6	6385	4359	3370	2445	4769	418	877	1367	1665	418	265	80	153	56	88	56
7	5010	4142	2340	2686	1279	4134	973	1375	893	1206	619	241	121	113	64	48
8	5460	2429	2228	2067	1504	450	3426	909	547	273	901	474	153	265	129	137
9	1753	804	1351	852	828	780	322	1536	402	410	523	507	394	434	161	290
10	458	346	627	298	378	370	651	161	627	290	354	257	426	579	193	233
11	97	40	113	8	177	257	225	177	145	491	298	338	225	483	298	426
12	161	16	16	56	97	306	225	145	80	129	290	209	185	418	225	483
13	129	0	32	0	16	362	249	145	80	24	88	121	72	193	249	281
14	48	0	16	0	0	1070	523	290	105	97	113	121	56	161	145	265
15	56	0	0	0	0	32	491	217	72	48	56	56	48	113	129	145
16+	40	0	0	0	0	40	8	32	24	113	105	97	56	97	185	161
total	27415	27351	20949	17523	13711	11637	11226	9377	5645	3772	3804	2670	2131	3169	1970	2766
N6+	19598	12135	10093	8412	9047	8219	7970	6353	4640	3498	3611	2501	1890	2911	1866	2525
Biomass	16043	14044	11983	10088	8657	7861	8228	6785	4097	3024	3436	2587	1606	2404	2048	2286

age	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
1	0	0	7	207	51	26	10		7	27	8	20	70			30		
2	113	32	28	7	1492	293	341	394	60	198	344	578	178	847	211	137		
3	281	113	37	13	69	1107	608	601	447	76	219	695	1176	442	980	458		
4	72	290	106	35		147	2000	1384	629	311	144	599	1275	923	717	918		
5	80	105	133	106	32	29	301	2467	980	718	135	101	936	1397	899	719		
6	105	105	139	119	127	22	187	454	2833	866	510	109	263	891	1136	1032		
7	105	129	72	49	120	80	72	94	447	1596	816	328	239	282	652	911		
8	129	105	57	49	108	57	139	49	84	138	1569	609	405	549	300	794		
9	249	225	123	35	104	94	122	90	111	64	190	1320	515	883	288	318		
10	314	201	163	47	111	90	70	176	143	94	65	140	1083	1528	467	240		
11	281	225	200	76	63	132	56	144	125	109	55	49	77	1623	617	488		
12	595	249	193	122	47	121	176	55	115	108	62	33	49	209	519	652		
13	426	354	192	143	118	63	125	107	45	55	46	41	21	68	66	504		
14	402	394	213	82	110	104	114	148	133	61	64	47	27	71	60	307		
15	330	257	201	75	150	121	134	82	130	54	50	55	34	86	46	75		
16+	523	547	323	236	561	353	497	672	323	195	201	228	175	329	228	212		
total	4013	3329	2188	1401	3262	2838	4952	6917	6614	4670	4477	4950	6523	10129	7186	7795		
N6+	3458	2791	1877	1033	1619	1237	1692	2072	4489	3340	3628	2959	2888	6519	4379	5533		
Biomass	3525	2760	1691	1053	1766	1442	2446	4084	4491	3698	3800	3821	4325	7475	6109	7654	7752	9372

Table 15. Redfish (*Sebastes norvegicus*) mean catch per haul and the estimated biomass by stratum, and their standard error in the 2021 survey.

stratum	area sq. miles	tow number	catch (kg)		Biomass (t.)	
			mean	s. e.	value	s.e.
1	342	4	0.05	0.05	1	1
2	838	10	4.76	2.03	303	130
3	628	7	17.20	6.37	823	304
4	348	4	2.36	2.15	63	57
5	703	8	2.89	1.24	155	67
6	496	6	19.88	7.32	751	277
7	822	9	15.68	4.10	982	257
8	646	7	20.84	11.10	1026	546
9	314	3	41.51	36.61	993	876
10	951	11	41.23	24.97	2987	1810
11	806	9	120.98	88.69	7429	5446
12	670	8	2.45	1.93	125	98
13	249	3				
14	602	7	1.70	1.21	78	56
15	666	8	0.14	0.14	7	7
16	634	7				
17	216	2				
18	210	2				
19	414	5				
20	525	6				
21	517	6				
22	533	6				
23	284	3				
24	253	3				
25	226	3				
28	530	6				
29	488	6				
30	1134	11				
31	203	2				
32	238	2				
33	98	2				
34	486	5				
Total < 1460 m.	16070	181	12.85	4.78	15723	5855
Total < 730 m.	10555	120	19.55	7.28	15723	5855

Table 16a. Redfish (*Sebastes norvegicus*): age-length key in the 2019 survey.
NOT YET AVAILABLE

Table 16b. Redfish (*Sebastes norvegicus*): age-length key in the 2020 survey.
NOT YET AVAILABLE

Table 16c. Redfish (*Sebastes norvegicus*): age-length key in the 2021 survey.
NOT YET AVAILABLE

Table 17. Redfish (*Sebastes norvegicus*) length frequency ('000) in the 2021 survey.

length	male	female	length	male	female	length	male	female
15	7	0	31	184	216	47	0	524
16	360	199	32	115	126	48	0	392
17	478	337	33	120	74	49	0	322
18	705	328	34	80	72	50	0	346
19	729	453	35	213	41	51	0	188
20	704	767	36	188	27	52	0	30
21	513	497	37	342	193	53	0	40
22	428	477	38	732	89	54	0	0
23	534	321	39	650	247	55	0	15
24	657	229	40	704	410			
25	167	291	41	470	100			
26	478	240	42	308	300			
27	173	349	43	188	349			
28	301	346	44	49	716			
29	306	296	45	70	790			
30	166	101	46	0	994	Total	11121	11829

Table 18a. *Sebastes norvegicus*: frequency at age ('000) by strata in the 2019 survey.
NOT YET AVAILABLE

Table 18b. *Sebastes norvegicus*: frequency at age ('000) by strata in the 2020 survey.
NOT YET AVAILABLE

Table 18c. *Sebastes norvegicus*: frequency at age ('000) by strata in the 2021 survey.
NOT YET AVAILABLE

Table 19. Redfish (*Sebastes mentella*) mean catch per haul and the estimated biomass by stratum, and their standard error in the 2021 survey.

stratum	area sq. miles	tow number	catch (kg)		Biomass (t.)	
			mean	s. e.	value	s.e.
1	342	4				
2	838	10				
3	628	7	15.52	8.26	743	395
4	348	4				
5	703	8	1.42	1.42	76	76
6	496	6	10.12	6.63	382	250
7	822	9	213.08	30.45	13344	1907
8	646	7	97.84	42.49	4816	2091
9	314	3	25.62	25.62	613	613
10	951	11	239.72	45.57	17370	3302
11	806	9	238.19	71.49	14627	4390
12	670	8	31.64	8.87	1615	453
13	249	3	92.02	82.71	1746	1569
14	602	7	267.52	63.07	12271	2893
15	666	8	103.74	30.00	5264	1522
16	634	7	1.07	0.58	52	28
17	216	2	100.68	100.68	1657	1657
18	210	2	174.93	173.65	2799	2778
19	414	5	26.60	20.49	839	646
20	525	6	0.28	0.28	11	11
21	517	6				
22	533	6				
23	284	3				
24	253	3				
25	226	3				
28	530	6				
29	488	6				
30	1134	11				
31	203	2				
32	238	2				
33	98	2				
34	486	5				
Total < 1460 m.	16070	181	63.89	6.49	78224	7939
Total <730 m.	10555	120	97.25	9.87	78212	7939

Table 20. *Sebastes mentella*: age-length key in the 2021 survey. NOT YET AVAILABLE.**Male****Female****Table 21.** Redfish (*Sebastes mentella*) length frequency ('000) in the 2021 survey.

length	male	female	length	male	female	length	male	female
14	50	20	25	340	430	36	250	2350
15	100	100	26	430	220	37	50	1610
16	1350	700	27	1140	740	38	80	890
17	5020	3460	28	2450	1570	39		450
18	18120	14850	29	3980	1440	40	10	280
19	50700	42050	30	6140	990	41		30
20	80910	67270	31	7740	1590	42		50
21	63170	49190	32	6300	1930	43	10	
22	19590	17320	33	3260	3080			
23	3520	2180	34	1720	2800			
24	870	450	35	540	2680			
						Total	277840	220720

Table 22. *Sebastes mentella*: frequency at age ('0000) by strata in the 2021 survey. NOT YET AVAILABLE.

Table 23. Redfish (*Sebastes fasciatus*) mean catch per haul and the estimated biomass by stratum, and their standard error in the 2021 survey.

stratum	area sq. miles	tow number	catch (kg)		Biomass (t.)	
			mean	s. e.	value	s.e.
1	342	4				
2	838	10	0.14	0.07	8	5
3	628	7	12.36	4.46	591	214
4	348	4	0.39	0.37	10	10
5	703	8	5.25	4.34	281	232
6	496	6	41.74	18.92	1577	715
7	822	9	83.14	16.40	5207	1027
8	646	7	119.67	49.42	5889	2432
9	314	3	320.37	277.34	7664	6635
10	951	11	177.03	77.68	12827	5629
11	806	9	72.70	14.79	4464	908
12	670	8	90.93	32.52	4641	1660
13	249	3	162.09	120.44	3075	2285
14	602	7	76.81	28.42	3523	1303
15	666	8	38.05	27.63	1930	1402
16	634	7	0.16	0.12	8	6
17	216	2				
18	210	2	1.26	0.46	20	7
19	414	5	0.53	0.37	16	11
20	525	6	0.05	0.05	2	2
21	517	6				
22	533	6				
23	284	3				
24	253	3				
25	226	3				
28	530	6				
29	488	6	0.02	0.02	1	1
30	1134	11				
31	203	2				
32	238	2				
33	98	2				
34	486	5				
Total < 1460 m.	16070	181	42.26	8.00	51736	9786
Total < 730 m.	10555	120	64.33	12.16	51733	9786

Table 24. *Sebastes fasciatus*: age-length key in the 2021 survey. NOT YET AVAILABLE.**Male****Female****Table 25.** Redfish (*Sebastes fasciatus*) length frequencies ('000) in the 2021 survey.

length	male	female	length	male	female	length	male	female
15	50	50	26	6070	2340	37	160	1170
16	3950	2800	27	10380	2320	38	70	640
17	6200	4990	28	10610	1900	39		420
18	7010	5750	29	8420	2470	40		140
19	5940	6120	30	3340	3490	41		170
20	6940	5660	31	2350	4480	42		90
21	4430	4600	32	770	5190	43		30
22	4470	3990	33	290	4500			
23	3860	2890	34	380	5930			
24	4180	2780	35	350	3670			
25	4760	3450	36		2160	Total	94980	84190

Table 26. *Sebastes fasciatus*: frequency at age ('0000) by strata in the 2021 survey. NOT YET AVAILABLE.

Table 27. Juvenile redfish (*Sebastes sp.*) mean catch per haul and the estimated biomass by stratum, and their standard error in the 2021 survey.

stratum	area sq. miles	tow number	catch (kg)		Biomass (t.)	
			mean	s. e.	value	s.e.
1	342	4	0.02	0.02	1	0
2	838	10	0.98	0.33	63	22
3	628	7	11.24	2.26	537	108
4	348	4	0.37	0.26	10	7
5	703	8	6.07	4.76	325	255
6	496	6	22.86	7.56	864	285
7	822	9	6.53	3.48	409	218
8	646	7	4.25	1.80	209	89
9	314	3	0.21	0.11	5	2
10	951	11	6.63	2.80	481	203
11	806	9	5.55	1.52	340	93
12	670	8	0.02	0.02	1	1
13	249	3	0.05	0.05	1	1
14	602	7	0.00	0.00		
15	666	8	0.02	0.02	1	1
16	634	7				
17	216	2				
18	210	2				
19	414	5				
20	525	6				
21	517	6				
22	533	6				
23	284	3				
24	253	3				
25	226	3				
28	530	6				
29	488	6				
30	1134	11				
31	203	2				
32	238	2				
33	98	2				
34	486	5				
Total < 1460 m.	16070	181	2.66	0.42	3246	514
Total < 730 m.	10555	120	4.04	0.63	3246	514

Table 28. Juvenile redfish (*Sebastes sp.*) length frequency ('000) in the 2021 survey.

length	Ind	Males	length	Ind	Males
6	10		13	15000	
7	510		14	17990	10
8	4810	10	15	15640	30
9	36420	80			
10	30550	190			
11	7650	150			
12	7600		Total	136180	470

Table 29. Greenland halibut (*Reinhardtius hippoglossoides*) mean catch per haul by strata and the estimated biomass with their standard errors in the 2021 survey.

stratum	Area sq. miles	tow number	catch (Kg)		Biomass (t.)	
			mean	s.e	value	s.e.
1	342	4				
2	838	10				
3	628	7	0.07	0.07	3	3
4	348	4				
5	703	8				
6	496	6	0.21	0.21	8	8
7	822	9	0.07	0.05	4	3
8	646	7				
9	314	3				
10	951	11	0.00	0.00	0	0
11	806	9	0.09	0.09	6	6
12	670	8	9.61	5.57	491	284
13	249	3	0.19	0.19	4	4
14	602	7	4.15	1.37	190	62
15	666	8	3.29	1.72	167	87
16	634	7	57.40	5.78	2773	279
17	216	2	47.85	15.21	788	250
18	210	2	10.71	1.21	171	19
19	414	5	40.18	8.52	1268	269
20	525	6	25.67	5.29	1027	212
21	517	6	19.92	3.99	784	157
22	533	6	21.16	6.23	859	253
23	284	3	16.66	3.83	361	83
24	253	3	24.71	6.07	476	117
25	226	3	23.00	5.55	396	95
28	530	6	42.16	7.65	1703	309
29	488	6	60.78	8.58	2260	319
30	1134	11	27.98	6.67	2418	576
31	203	2	18.01	3.66	279	57
32	238	2	115.92	6.76	2102	122
33	98	2	33.25	1.84	248	14
34	486	5	32.01	6.49	1185	240
Total < 1460 m.	16070	181	16.31	0.84	19969	1036
Total < 730 m.	10555	120	7.30	0.68	5872	553

Table 30. Greenland halibut (*Reinhardtius hippoglossoides*) biomass (t.) by strata in 1988-2021 surveys.

Strata	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2	0	3	6	0	0	0	0	121	0	2	6	3	0	15	10	0
3	26	31	8	8	18	3	0	21	108	90	367	347	244	384	140	55
4	144	20	0	15	27	10	0	5	0	23	41	197	207	157	58	105
5	74	98	0	28	42	1	2	21	36	98	173	409	307	268	66	92
6	31	18	15	12	8	15	0	31	106	228	361	301	178	265	104	21
7	85	63	58	189	246	94	214	904	1148	1423	2607	2356	1570	982	429	414
8	151	222	62	180	379	140	46	333	359	1065	989	1993	1317	1124	878	507
9	180	165	53	76	323	30	43	178	160	254	471	354	245	355	138	140
10	108	82	58	172	362	31	235	526	716	862	1369	1528	1602	1743	744	286
11	45	61	22	106	229	234	236	492	671	627	1227	1320	1088	1021	338	277
12	405	647	288	761	619	933	1219	1147	2124	2248	3077	3661	2174	1582	1086	673
13	64	124	218	44	24	143	152	127	298	484	554	978	382	291	521	61
14	368	302	284	787	847	0	620	410	902	1589	1461	1080	491	877	1081	885
15	435	169	525	973	643	1378	1492	1768	1448	2689	4055	2987	2687	1616	1233	607
16	1374	1363	2543	2527	1827	2175	1524	1861	2098	1770	3356	1143	2016	1328	2182	633
17	266	120	127	415	40	0	742	742	258	525	737	603	498	170	204	148
18	106	50	506	354	58	0	386	958	191	557	775	932	179	574	694	1062
19	3064	934	1026	1522	3036	1342	1126	1230	971	1564	2603	1015	1774	1120	2194	248
20																
21																
22																
23																
24																
25																
28																
29																
30																
31																
32																
33																
34																
Total (1-19)	6926	4472	5799	8169	8728	6529	8037	10875	11594	16098	24229	12071	16959	3872	2100	6214
s.e. (1-19)	768	392	809	817	1389	956	678	1226	882	1136	1348	1520	923	776	662	611
Total (1-34)																
s.e. total (1-34)																

Table 30 (cont.) Greenland halibut (*Reinhardtius hippoglossoides*) biomass (t.) by strata in 1988-2021 surveys.

Strata	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
1	2																	
2	14	7	9													1		
3	852	416	324	22		4	7						0	1	4	5	0	3
4	348	91	182	8									0		12			
5	253	280	231	92	14	7		6			0	6		2	4	0		
6	466	332	61	75	8					0	2	1	8		3	6	12	8
7	1032	596	778	729	524	11	15	3		4	9	12	21	9	18	39	47	4
8	811	934	910	432	226	31	0		0				15	2	20	12	16	
9	464	91	550	487	401	31	0			10						6	47	
10	754	1059	851	559	777	25	19	5				1	1	23	11	26	15	0
11	631	1063	290	504	563	21	32	1	9	2	3		17	8	17	11	18	6
12	902	1020	978	1246	1393	1217	743	126	332	140	239	522	133	282	218	363	999	491
13	447	311	219	392	431	217	273	33	19			80	26	9	98	129	378	4
14	1659	618	573	878	1023	742	62	35	256	28	22	22	89	121	131	169	285	190
15	1084	1747	1783	3041	1621	771	1224	112	111	89	119	241	49	171	81	476	1136	167
16	1166	1357	1752	2264	1623	2186	2079	1892	1911	1038	2165	3049	2188	3921	1772	2179	1762	2773
17	223	429	639	407	411	558	446		401	170	298	395	682	562	369	208	625	788
18	578	434	606	864	944	540	526	563	325	395	696	687	277	74	308	249	497	171
19	608	915	971	1042	2035	1414	1231	3700	927	924	1615	1560	2633	2447	2510	1617	812	1268
20	1647	1061	666	2041	4119	1856	1490	2471	2381	1858	3556	2536	1904	4109	3498	1490	1081	1027
21	906	345	359	742	2161	1569	1366	1257	1496	1952	1210	4577	1058	3080	1809	714	796	784
22	607	510	845	551	883	1971	2411	1226	714	1220	1201	4707	1901	3530	1741	730	188	859
23	407	42	130	495	1144	474	715	464	281	534	576	1623	677	1579	956	392	294	361
24	208	328	555	588	1082	1185	460	1749	652	379	540	846	1082	796	430	813	455	476
25	2377	993	322	436	441	732	473	593	459	392	968	450	506	1127	380	352	478	396
28	1614	1162	1239	2857	3920	3153	1994	4188	2244	2150	1955	5627	2920	7414	4914	1629	890	1703
29	2300	1330	674	1487	3335	2618	2091	2044	2238	2060	4603	7198	3038	6525	4561	1956	684	2260
30	2025	602	2771	4719	5067	7692	5381	5061	4737	4684	3916	14974	5662	8756	7340	3933	2438	2418
31	546	186	354	347	385	944	319	414	82	461	754	1631	659	1393	563	374	32	279
32	598	596	1357	1040	1755	2391	1539	1916	1097	1244	2610	4308	2588	2597	2101	1375	1208	2102
33	358	147	607	166	698	309	408	707	320	594	474	542	678	597	250	333	425	248
34	2675	1461	1886	2222	2627	3377	1790	3454	2514	3063	1756	2585	5831	3101	2362	1085	575	1185
Total (1-19)	12288	11701	11709	13044	11990	7777	6659	6475	4291	2801	5168	6576	6139	7633	5578	5496	6649	5872
s.e. (1-19)	796	627	611	1576	1182	724	812	2744	338	352	542	1246	802	812	691	398	790	553
Total (1-34)	28565	20459	23471	30732	39609	36046	27096	32019	23506	23398	29288	58180	34642	52237	36482	20673	16194	19969
s.e. total (1-34)	2669	918	1237	2510	2620	3073	1788	3857	1414	1843	16736	4046	3454	3263	2152	1266	1145	1036
total_700-1400	16269	8761	11765	17690	27615	28270	20438	25545	19214	20589	24121	51604	28503	44604	30904	15177	9545	14097
s.e._700-1400	2544	664	1080	1958	2349	2988	1597	2721	1375	1816	1802	3849	3360	3161	2038	1201	829	877

Table 31. Greenland halibut (*Reinhardtius hippoglossoides*) age-length key in the 2021 survey.**MALE**

Length cm	age																total
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16+	
14-15	1																1
16-17																	0
18-19																	0
20-21																	0
22-23																	0
24-25																	0
26-27			1														1
28-29				1													1
30-31			1	9													10
32-33				7													7
34-35				9	11												20
36-37				7	19	1											27
38-39					32	1											33
40-41					19	18											37
42-43					12	27											39
44-45					6	30	3										39
46-47						34	4										38
48-49						27	9										36
50-51						12	24										36
52-53						5	20	8									33
54-55							17	6	1								24
56-57							3	8	1								12
58-59							2	4	5								11
60-61									1	1							2
total:	1	0	2	33	99	155	82	26	8	1	0	0	0	0	0	0	407

Table 31 (cont.) Greenland halibut (*Reinhardtius hippoglossoides*) age-length key in the 2021 survey.**FEMALE**

length cm	age																total	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16+		
16-17	2																	2
18-19																		0
20-21																		0
22-23																		0
24-25																		0
26-27			1															1
28-29				4														4
30-31				3														3
32-33			1	7	1													9
34-35				2	10													12
36-37					20													20
38-39				1	25	4												30
40-41					22	16												38
42-43					10	32												42
44-45					4	42												46
46-47						34	7											41
48-49						20	19											39
50-51						3	35	1	1									40
52-53							29	7	3									39
54-55							14	13	7									34
56-57							6	16	10	4								36
58-59							3	16	11	7								37
60-61							1		10	18	6	2						37
62-63									1	16	9	5						31
64-65										10	5	7	3	1				26
66-67										5	11	6	5	1				28
68-69										1	9	5	2	2				19
70-71											1	1	3	4				9
72-73												2	3	4	2			11
74-75												1	4	4	2			11
76-77													2	2	2			6
78-79														1	1	1		3
80-81																	3	3
82-83																	2	2
84-85															1	1		2
86-87																		0
88-89																	2	2
90-91																		0
92-93																	1	1
total:	2	0	2	17	92	151	114	53	43	61	41	29	22	19	8	10		664

Table 32. Greenland halibut (*Reinhardtius hippoglossoides*) length frequency ('000) in the 2021 survey.

depths < 730 m

length	male	female	length	male	female	length	male	female
14-15	7		34-35	159	66	54-55	48	176
16-17		15	36-37	191	126	56-57	49	145
18-19			38-39	293	338	58-59	8	93
20-21			40-41	329	446	60-61		47
22-23			42-43	373	685	62-63		41
24-25			44-45	482	620	64-65		15
26-27	7	8	46-47	340	549	66-67		31
28-29	8	36	48-49	283	448	68-69		15
30-31	85	30	50-51	185	309			
32-33	63	44	52-53	116	277			
						total	3026	4560

depths < 1460 m

length	male	female	length	male	female	length	male	female
14-15	7		42-43	826	1196	70-71		77
16-17		14	44-45	961	1419	72-73		93
18-19			46-47	771	1176	74-75		93
20-21			48-49	690	1185	76-77		56
22-23			50-51	479	929	78-79		20
24-25			52-53	406	871	80-81		26
26-27	7	8	54-55	274	626	82-83		15
28-29	18	36	56-57	104	706	84-85		18
30-31	85	30	58-59	95	609	86-87		
32-33	73	65	60-61	16	550	88-89		17
34-35	194	110	62-63	10	380	90-91		
36-37	302	232	64-65		298	92-93		9
38-39	516	439	66-67		340			
40-41	683	777	68-69		182			
						total	6517	12602

Table 33. Greenland halibut (*Reinhardtius hippoglossoides*) frequency at age ('0000) and strata in the 2021 survey.

	strata																												Average	
	3	6	7	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	28	29	30	31	32	33	34	total	Weight (g)	Length (cm)	
1	7		7					7																			22	29	16	
2																														
3			8	7	2			2	4	1		4											2				31	194	29	
4	2	4	3		80			31	133	26	5	106	13	1					2	5	20	2	46		2	482	286	33		
5	5	16	4	1	221	4	36	84	646	227	67	496	154	69	29	19	70	31	176	160	240	7	214	14	136	3126	511	40		
6				6	359	3	93	104	1390	440	111	925	367	225	186	61	174	116	466	585	574	16	537	80	528	7344	754	45		
7				1	78		48	20	682	155	42	254	174	205	186	66	110	101	360	345	313	30	266	57	318	3809	1117	51		
8					11		4	4	180	55	10	39	68	52	76	36	42	37	155	120	126	10	114	17	109	1267	1450	56		
9					5		4	4	87	31	5	20	46	18	49	20	21	28	113	95	105	9	94	13	62	829	1578	57		
10					2		8	4	47	21		9	55	33	34	16	19	21	111	126	150	18	137	14	27	850	1981	61		
11					3		5	1	26	4		1	31	26	21	10	9	6	50	92	85	11	87	6	10	485	2332	65		
12					2		4		15	2			23	19	15	7	6	4	24	67	64	8	57	5	5	326	2445	66		
13					1		2		6				14	13	10	10	3	2	8	47	47	6	45	2	2	217	2948	70		
14					1		1		2				8	5	10	7	3	2	2	41	39	5	37	2	4	169	3231	72		
15													1	1	6	4	1	1		13	20		16	1	3	68	3906	76		
16+													7	4					8	17	33	9		1	3	83	5309	84		
Sets	2	1	2	1	1	7	1	6	5	7	2	2	5	6	6	6	3	3	3	6	6	11	2	2	2	5	103	1056	49	
n	15	20	15	7	15	764	7	205	263	3219	963	240	1854	955	675	624	255	459	350	1474	1712	1814	130	1652	213	1209	19107	20180		

Table 34. Greenland halibut (*Reinhardtius hippoglossoides*) abundance at age ('000) in the 1991-2021 surveys.

<730 m. strata (1-19)

	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
1	1302	1677	1423	1429	9978	4699	2674	2200	852	3014	6459	3282	1768	1762	437
2	207	1260	1245	996	2045	6408	3036	1716	563	235	1153	2364	804	2644	652
3	348	447	777	1365	1793	1942	4822	6180	2419	479	1456	2248	489	3517	2554
4	1054	1023	692	1435	1535	2442	5225	8843	8419	1741	799	1342	1217	1585	2007
5	2307	1852	1021	1545	2136	3380	5714	9919	10787	5703	2242	3045	1991	5601	5537
6	1291	2249	1545	2385	4099	4680	6800	9085	10119	11336	6262	4498	2362	6271	6105
7	2212	1947	1627	2139	3029	2001	4014	6304	4467	4346	5328	4610	1552	2040	2345
8	534	1054	1266	1180	1706	1299	1731	2108	1466	1865	2584	1025	375	518	491
9	462	468	776	631	1052	341	528	600	280	361	147	104	105	233	89
10	352	273	213	219	209	70	177	157	82	92	36	48	79	107	97
11	141	138	104	90	53	21	23	27	6	44	5	16	15	63	44
12	12	67	38	47	18	31	17	6	3	0	0	6	4	38	15
13	0	25	21	18	0	0	17	16	3	0	0	0	0	5	3
14	0	12	9	0	5	4	0	0	5	0	0	0	0	3	3
15	15	0	0	0	0	5	6	0	0	0	0	0	0	3	3
16+	8	0	0	0	0	0	9	0	0	0	0	0	0	3	3
Total	10245	12490	10757	13479	27659	27323	34792	47160	39470	29216	26471	22587	10762	24390	20374
Freq 10+	528	515	385	374	285	131	249	206	99	136	41	70	98	222	168

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
1	550	301	157	61	38			6	20	40	211	924	369	458	60	22
2	312	64	78	7	9		8			13	15	41	221	287	147	
3	525	455	121	30	29		36	4	3		7	21	255	226	372	28
4	949	275	155	81	47	60	87	112	97	48	3	78	84	381	528	391
5	4800	2765	1203	606	894	880	822	643	1089	719	264	1067	1136	1655	2295	1807
6	6002	5928	4586	2905	2469	2930	1827	1733	2315	3440	1826	3071	2705	2346	3307	3430
7	2665	4632	4950	3255	2365	2850	1406	718	1566	2091	2256	2867	1687	1440	1323	1279
8	623	1217	909	713	715	570	349	158	283	493	733	735	502	413	305	305
9	180	247	283	153	259	160	112	39	63	120	219	225	149	205	238	157
10	143	165	210	215	137	110	83	44	66	115	123	160	147	102	175	90
11	103	62	100	62	50		54	12	22	50	64	56	47	40	59	42
12	45	38	43	47	22	10	15	10	9	12	27	18	16	10	38	24
13	10	5	18	35	10		10	6	12	2	17	18	5	7	11	9
14		2	10	12	2		10	2	6		5	4	6	1	5	3
15			4	0			3	4	3		3			1		
16+			1	0			6	1	2		2			1		
Total	16907	16156	12825	8182	7046	7420	4823	3492	5156	7143	5775	9284	7330	7573	8863	7587
Freq 10+	301	272	386	371	221	120	181	79	54	179	241	256	221	162	288	168

Table 34 (cont.) Greenland halibut (*Reinhardtius hippoglossoides*) abundance at age ('000) in the 1991-2021 surveys.

< 1460 m. strata (1-34)																		
	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
1	1710	438	550	310	160	60	38			6	20	40	210	926	369	458	66	22
2	2680	652	320	60	80	10	9		8			10	20	41	232	287	151	
3	3580	2561	540	480	120	40	29	10	46	15	8	10	10	28	259	240	380	31
4	1880	2117	1110	360	200	100	137	110	200	393	200	150	10	363	152	758	621	482
5	8330	6470	7160	4700	2480	1380	2447	2270	2964	2583	3405	3110	710	5134	2610	3738	3393	3126
6	11210	8314	10480	11130	11020	8330	7356	8200	7073	8608	9839	18180	5970	14080	7333	5408	5764	7344
7	6060	4182	5730	10490	15340	13990	9587	10390	6124	5538	8415	17190	11310	15536	8776	4204	2835	3809
8	1790	1206	1700	3530	3890	4340	3063	3140	2349	2005	1989	5650	4820	5902	3787	1611	887	1267
9	890	318	510	880	1400	1140	1200	1360	920	643	548	2040	1800	2586	1933	1105	815	829
10	450	500	440	720	1060	1260	1019	1490	906	1026	780	1730	1300	2158	2671	1057	729	850
11	320	282	370	370	540	440	383	560	587	412	406	960	660	845	1129	620	387	485
12	200	161	180	210	300	340	213	320	233	349	182	360	280	333	647	252	248	326
13	180	74	60	80	160	310	151	270	126	153	235	210	190	382	364	121	201	217
14	70	47	30	60	120	170	114	140	114	73	131	230	100	115	232	98	140	169
15	80	9	10	20	80	50	59	50	75	103	55	150	80	152	122	93	46	68
16+	60	9	10	10	70	70	55	40	140	94	81	120	90	194	101	118	64	83
Total	39490	27340	29200	33410	37020	32030	25860	28350	21865	22002	26294	50140	27560	48774	30717	20168	16727	19108
Freq																		
10+	1360	1082	1100	1470	2330	2640	1994	2870	2181	2210	1870	3760	2700	4178	5266	2359	1815	2198

Table 35. Roughhead grenadier (*Macrourus berglax*) mean catch per haul by strata and the estimated biomass with their standard errors in the 2021 survey.

stratum	Area sq. miles	tow number	catch per tow (Kg)		Biomass (t.)	
			mean	s. e.	value	s.e.
1	342	4				
2	838	10				
3	628	7				
4	348	4				
5	703	8				
6	496	6				
7	822	9				
8	646	7				
9	314	3				
10	951	11				
11	806	9				
12	670	8	0.72	0.32	37	16
13	249	3	2.05	1.12	39	21
14	602	7	1.72	0.68	79	31
15	666	8	0.54	0.33	28	16
16	634	7	0.95	0.46	46	22
17	216	2	7.86	6.13	129	101
18	210	2	10.78	2.31	172	37
19	414	5	5.36	1.79	169	56
20	525	6	1.82	0.98	73	39
21	517	6	8.10	4.71	319	185
22	533	6	12.08	2.82	490	114
23	284	3	8.10	1.09	175	24
24	253	3	8.49	6.53	164	126
25	226	3	16.28	3.31	280	57
28	530	6	1.52	0.67	62	27
29	488	6	5.48	1.75	204	65
30	1134	11	10.22	2.35	883	202
31	203	2	10.89	0.58	168	9
32	238	2	5.39	2.87	98	52
33	98	2	9.59	7.77	72	58
34	486	5	7.51	3.68	278	136
Total < 1460 m.	16070	181	3.24	0.32	3964	395
Total < 740 m.	10555	120	0.88	0.16	699	131

Table 36. Roughhead grenadier (*Macrourus berglax*) biomass by strata in 1988-2021 surveys.

Stratum	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
1																	
2								8									
3																	10
4															9		
5																	
6									22								
7					0								3	0		0	10
8		10		1					11	3		7		16	2	13	28
9	47	4		5	28	21	3	21	153	18	40	45	29	29		30	282
10	1								6	1		18	68	18		0	48
11												3	8	6			3
12	112	103	40	108	100	413	55	126	46	137	55	191	81	236	154	165	292
13	21	64	18	18	60	18	32	75	5	18	78	92	50	116	121	123	299
14	200	145	107	85	139		73	67	270	77	194	135	103	292	124	346	877
15	92	5	29	64	52	321	82	180	84	69	101	72	103	60	16	87	259
16	349	140	212	229	432	1333	523	256	397	211	405	150	225	338	272	352	594
17	134	45	31	180	123		98	129	27	116	204	96	67	370	380	101	244
18	311	128	143	356	215		756	414	154	224	189	313	219	383	27	877	423
19	743	227	273	289	429	915	352	282	187	322	424	129	92	216	116	245	228
20																	419
21																	1432
22																	1095
23																	897
24																	137
25																	344
28																	425
29																	3113
30																	3553
31																	650
32																	274
33																	118
34																	1131
total (1-19)	2009	871	852	1335	1577	3021	1975	1558	1362	1197	1691	1250	1047	2079	1211	2348	3597
s.e. (1-19)	264	142	149	250	270	487	169	223	277	169	243	338	196	284	176	611	362
total																	17184
s.e. total (1-34)																	1616

Table 36 (cont.) Roughhead grenadier (*Macrourus berglax*) biomass by strata in 1988-2021 surveys.

Stratum	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
1																	
2																	
3																	
4																	
5																	
6																	
7																	
8	65	13															
9	82	181	17	39													3
10	38	21											0	0			
11	2																
12	207	97	22	92	73	60	0	27	39	17	14	29	34	35	35	50	37
13	94	154	80	108	25	97	43	6			0	2	15	12	20	57	39
14	379	362	223	539	1	3	10	67	28	14	27	42	70	19	4	30	79
15	16	85	55	12		132	8		34	4	14	20	15	38	85	40	28
16	426	1391	242	493	213	79	112	134	122	102	26	80	108	125	62	90	46
17	124	603	70	385	40	278	38	111	134	52	142	62	77	110	123	89	129
18	588	435	491	610	194	685	445	235	422	173	202	100	227	195	178	139	172
19	366	592	167	683	235	69	73	32	29	36	51	37	70	91	84	126	169
20	182	353	144	269	130	355	78	88	47	101	25	120	94	55	263	199	73
21	996	763	755	1114	528	1135	1606	768	299	375	198	394	349	399	405	439	319
22	1115	1545	608	1735	1216	967	1610	945	537	747	658	669	548	376	906	712	490
23	463	342	332	399	305	388	506	325	382	168	251	259	113	264	229	141	175
24	1030	419	165	152	146	207	222	218	97	160	87	53	158	278	135	97	164
25	870	817	197	391	362	149	98	146	260	326	226	100	1093	276	668	125	280
28	695	610	299	360	273	338	137	68	70	29	57	89	184	141	57	90	62
29	1012	445	527	555	424	509	163	309	200	437	265	154	275	340	347	615	204
30	2869	1108	2139	3356	2560	2816	2965	1582	1224	836	887	1137	1023	1217	2313	717	883
31	327	235	242	176	225	107	295	137	60	199	270	153	113	123	127	35	168
32	267	132	86	222	197	242	172	63	100	80	117	92	361	94	264	100	98
33	17	122	105	38	12	57	112	54	22	42	39	89	43	28	40	27	72
34	330	511	305	410	144	419	145	162	191	212	146	154	171	159	155	115	278
total (1-19)	2387	3933	1367	2961	782	1403	729	612	807	399	478	373	616	625	590	624	699
s.e. (1-19)	281	700	314	611	209	201	409	258	141	113	147	86	143	142	201	187	131
total	12560	11336	7270	12139	7304	9091	8838	5476	4298	4111	3702	3836	5141	4375	6500	4037	3964
s.e. total (1-34)	1420	1167	808	659	478	930	1212	678	475	407	300	403	914	356	1318	1318	395

Table 37. Roughhead grenadier (*Macrourus berglax*) age-length key in the 2021 survey.**MALE**

Length cm	age																total
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16+	
4	1																1
5		5	2														7
6		10	3														13
7		3	1														4
8			7	1													8
9			7	3													10
10			5	10	2												17
11			3	11	6												20
12				3	19												22
13				1	14	8											23
14				1	13	9	2										25
15					5	24	5	1									35
16						8	15	12									35
17							11	23	6								40
18							1	12	16	6							35
19								3	14	4							21
20								1	3	10	4						18
21										2	5	3					10
22									1		4	3	2				10
23												2		1			3
24																	0
25																	0
26														1			1
27															1		1
total	1	18	28	30	59	49	34	52	40	22	13	8	2	2	1	0	359

Table 37 (cont.) Roughhead grenadier (*Macrourus berglax*) age-length key in the 2021 survey.**FEMALE**

Length cm	age																total
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16+	
4		2															2
5		8	2														10
6		14	2														16
7		3	2														5
8			3	1													4
9			4	5													9
10			1	9	1												11
11				9	3												12
12				4	9	4											17
13					10	7											17
14					8	8	4										20
15					1	12	8	1									22
16						1	13	6									20
17							5	10	1								16
18							1	5	9								15
19								11	8								19
20									11	4	1						16
21										4	7	3					14
22										1	12	1	1				15
23											7	2	1				10
24											2	1	1	2			6
25													7	6			13
26													2	2			4
27													4	6	1		11
28													1	3	2	1	7
29														2	2	2	6
30															3	8	11
31																7	7
32																5	5
33																6	6
34																1	1
35																1	1
36																	0
37																1	1
38																	0
39																3	3
40																2	2
total	0	27	14	28	32	32	31	33	29	9	29	7	17	21	8	37	354

Table 38. Roughhead grenadier (*Macrourus berglax*) length frequency ('000) in the 2021 survey.

depths < 730 m. strata (1-19)											
length	indet.	male	female	length	indet.	male	female	length	indet.	male	female
3	8			14		36	39	25			35
4			15	15		75	40	26			10
5		8	16	16		45	63	27			9
6		19	26	17		69	17	28			9
7		7	18	18		88	15	29			7
8				19		59	61	30			7
9		37	15	20		44	17	31			
10		25		21		32	57	32			
11			8	22		23	43	33			
12		8	24	23		9	15	34			9
13		39	25	24			17	Total	8	622	616

depths < 1460 m. strata (1-34)											
length	indet.	male	female	length	indet.	male	female	length	indet.	male	female
3	35		12	18		464	132	33			50
4		9	38	19		272	162	34			9
5		48	60	20		169	132	35			9
6		105	135	21		79	114	36			
7		52	35	22		70	120	37			4
8		43	41	23		25	82	38			
9		85	68	24		7	47	39			26
10		142	88	25			111	40			18
11		183	99	26		8	41				
12		237	149	27		9	74				
13		288	134	28			54				
14		386	165	29			47				
15		508	244	30			84				
16		561	280	31			49				
17		538	128	32			42	Total	35	4287	3083

Table 39. Roughhead grenadier (*Macrourus berglax*) frequency ('000) at age and strata in the 2021 survey.

Age	strata																				total	mean		
	12	13	14	15	16	17	18	19	20	21	22	23	24	25	28	29	30	31	32	33		34	Weight (g)	Length (cm)
1					8				8							19		10			44	4	3	
2	13			6	6	16	32	13	19	23	59	7	20	26	11	20	64		16	26		379	20	6
3	1		2	1	2	10	36	8	10	44	52	6	9	35	8	18	42	1	8	6	28	329	59	8
4	2		6		9	3	21	9	9	63	56	22	29	33	10	76	70	9	20	8	50	505	113	11
5	11	6	29	1	13	15	18	16	15	122	84	52	6	43	39	68	205	47	82	14	107	992	196	13
6	7	7	40	6	14	34	16	21	15	111	97	48	5	43	23	68	240	53	82	9	80	1019	272	15
7	8	8	32	6	14	20	13	23	13	75	67	37	2	42	12	87	267	29	42	5	57	858	353	16
8	14	7	33	12	17	14	27	46	10	72	107	40	8	53	7	85	323	44	41	3	73	1036	439	17
9	12	3	29	15	11	12	19	46	7	43	93	20	28	22	5	49	193	52	34		62	756	548	19
10	6	5	11	8	12	10	8	20	6	29	38	8	7	5	1	20	69	15	15		19	315	635	20
11	7	8	7	2	13	30	15	33	7	57	29	5	17	4		15	63	14	3		10	338	859	22
12	4	4			5	8	11	11	3	25	19	2	4	2		2	10	2			5	117	892	22
13		5				13	16	5	3	12	18	5	9	17		6	19	7		2	18	153	1305	25
14		3				13	20	5	5	13	34	4	17	20		10	17	4		2	16	183	1473	26
15							3	4		1	16		11	6	2	5	7			2	13	69	1908	29
16+							10	8	8		52	17	12	46	13	4	75	19		12	16	292	2844	33
Sets	5	3	6	3	4	2	2	5	5	6	6	3	3	3	4	5	11	2	2	2	5	87	508	16.2
n	87	56	190	57	124	199	266	267	137	690	821	272	183	397	131	531	1683	297	355	89	554	7385	3755	

Table 40. Roughhead grenadier (*Macrourus berglax*) abundance at age ('000) in the 1994 - 2021 surveys.

<730 m. strata (1-19)

age	Year																											
	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
1			129		51	15	3	63	39	467	216	109	10	12	5	3	30	18	9	14	16	18	15	34	37		17	8
2	46	107	56	46	128	36	77	208	189	2139	466	267	353	23	79	15	73	48	49	31	63	112	255	178	171	86	34	86
3	136	209	110	186	227	49	108	271	220	1077	3119	362	438	59	228	31	232	76	79	26	25	73	81	170	110	157	49	62
4	487	467	224	153	236	216	50	120	57	672	1009	762	392	35	219	42	107	69	14	27	30	41	68	78	53	136	47	50
5	507	861	351	157	138	199	283	283	108	618	877	628	501	87	170	25	81	39	25	22	5	21	34	115	75	138	95	110
6	570	592	586	450	346	247	277	445	189	635	1105	544	561	202	285	96	66	54	24	15	0	32	36	59	77	104	65	145
7	566		351	613	725	445	218	540	290	843	810	499	719	268	458	94	128	63	40	32	8	40	49	71	65	85	99	124
8	493	458	338	162	907	616	231	505	283	901	955	593	519	298	743	168	446	119	98	118	16	63	59	58	78	73	154	170
9	379	263	216	158	250	422	339	510	241	535	962	413	487	178	536	87	492	199	124	126	37	58	39	44	46	26	127	147
10	181	113	264	98	226	197	338	666	266	474	896	579	577	345	471	48	347	251	129	203	52	99	37	97	50	48	130	80
11	109	35	254	151	135	109	72	231	203	472	465	371	727	172	431	82	224	122	154	233	88	86	47	59	22	46	74	115
12	82	23	93	164	182	80	95	131	244	236	392	167	396	108	162	56	113	70	84	115	90	58	39	36	26	41	46	43
13	40	19	38	124	152	55	57	80	75	88	147	227	293	95	318	56	62	43	44	25	52	56	24	47	56	41	46	40
14	15	5	34	42	76	61	55	104	63	31	89	191	211	77	79	49	61	33	23	32	22	23	28	65	38	35	22	41
15	27	15	4	42	48	33	23	55	19	18	18	21	195	39	179	43	21	18	14	12	15	21	23	34	43	22	4	8
16+	9		10	18	34	3	33	76	64	73	60	33	215	72	116	94	19	25	3	18	14	11	16	31	65	55	26	18
Total	3647	3685	3060	2564	3862	2783	2259	4288	2550	9278	11584	5765	6593	2069	4479	988	2501	1247	911	1049	533	811	851	1175	1010	1095	1035	1246

Table 40 (cont.). Roughhead grenadier (*Macrourus berglax*) abundance at age ('000) in the 1994 – 2021 surveys.

< 1460 m. strata (1-34)

Age	Year																	
	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
1	461	391	34	51	52	19	37	39	52	71	103	70	36	34	49	50	40	57
2	856	719	602	81	549	143	125	172	177	178	244	501	648	494	304	307	167	379
3	6380	1420	855	222	1086	306	622	395	405	279	221	482	575	863	648	793	402	329
4	2989	2303	1532	321	1268	419	616	509	349	320	298	531	818	902	767	1685	489	505
5	2576	2425	1399	543	1269	253	755	587	409	316	232	503	697	1303	1181	2023	1136	992
6	3062	2695	2316	1063	1578	954	1084	775	348	435	346	657	733	545	879	1487	855	1019
7	2552	2069	2351	1209	1954	936	1054	1009	572	533	344	688	713	791	873	1059	719	858
8	3215	2418	1184	1285	2010	1680	2392	1466	1052	836	507	593	602	717	1003	963	831	1036
9	2670	1442	1737	770	1649	866	1451	1241	919	610	436	449	405	365	554	386	517	756
10	2282	1666	1643	1109	1454	476	911	1160	517	638	300	442	347	698	382	451	423	315
11	1863	1123	1409	697	1333	824	685	652	650	583	350	295	294	409	234	387	208	338
12	1374	676	739	473	626	564	565	660	491	317	441	219	204	299	254	275	149	117
13	670	1090	823	412	1170	563	461	516	429	116	350	316	200	357	252	332	142	153
14	416	1007	566	432	348	490	510	570	307	247	259	125	214	420	160	271	180	190
15	178	298	478	272	718	434	255	460	215	138	237	280	228	256	193	167	125	69
16+	1130	1113	1069	944	887	959	692	1044	373	443	372	338	352	468	457	746	464	292
total	32674	22855	18737	9884	17951	9886	12215	11255	7265	6059	5039	6487	7066	8920	8190	11382	6847	7405

Table 41. Squid (*Illex illecebrosus*) biomass (t.) by strata and total abundance ('000) in 1988-2021 surveys.

Strata	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
1			15	0	0		17		0		8				
2	1	0	120	18	12		19		6	8	17	3		0	0
3			9	93	1		6		12	3	5	1		1	0
4			3	3	4		8		3	1	3	0			0
5	1	4	1090	4	20		58	0	26	9	12	3		0	0
6		0	468	472	4		10	0	6	8	6	1			0
7	1		22	130	1	0	8		5	3	1	1		0	0
8			1	29	3	0	8		13	3	8	1		0	0
9		1	24	4	3		6		3	4	1				0
10	3	4	216	646	17	0	81		28	18	20	3		1	1
11			128	40	12		27	0	3	13	4	3		1	0
12				1				0	3	1	1	1	1	1	1
13				1			8			1	0	0	0		0
14			4	22	4		5	0	4	6	4	1		1	
15			5	13	3		4		1	1	0	1	0	1	1
16				4					0	1	1	1	1	1	1
17					0		1			0		0	0		1
18		0	1		1		4			0	0			0	
19				3	0		0	0	1	1	1	1	0	1	1
20															
21															
22															
23															
24															
25															
28															
29															
30															
31															
32															
33															
34															
Total (1-19)	6	9	2107	1483	83	1	269	1	113	81	92	22	3	10	8
s.e. (1-19)	4	4	604	395	18	1	33	1	15	12	12	4	1	3	3
Total (1-34)															
s.e. total (1-34)															
Abundance (1-19)	67	86	21184	17064	1114	32	3749	62	1561	1104	1481	801	182	608	457
Abundance (1-34)															

Table 41 (cont.) Squid (*Illex illecebrosus*) biomass (t.) by strata and total abundance (('000) in 1988-2021 surveys.

Strata	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
1	5	42	2	385	1	7	13	0	1	1				18	0	10			
2	29	36	7	1181	10	1736	296	6	14	11				0	383	4	86	4	10
3	8	19	2	8	62	66	158	1	1	1		0		0	630	1	33	2	63
4	2	51	2	130	0	6	17			1		0		0	31	3	41		1
5	81	89	5	1457	40	357	285	3	2	8		0			114	15	22	14	
6	5	26	4	222	58	37	21	3	3	0					259	2	37	28	16
7	22	39	6	28	38	48	34	3	1	1		0		1	294	2	1	10	89
8	8	8	1	7	24	38	36	2	4	0		1		0	19	1	43	2	29
9	2	25		1	22	16	345		5						10	8	8	1	
10	25	52	17	26	56	2560	359	16	24	8		0			323	5	28	19	26
11	12	36	13	86	88	104	41	3	28	5		0		1	227	5	20	57	50
12	6	11	1	3	2	2	23			0					0	1	16	1	30
13	0	9	1					0							1		5		
14	10	15	4	1	6	106	52	5	5			0			17	1	5	1	3
15	6	3	6	4	3	49	2		0						18	0	5	2	5
16	1	4	4			2	0									0	2		6
17	0	1	2			0		0							4			0	
18	1	1	0			1	3			1					1				
19	1	3	2	1		0	1								1		0		1
20		1	3	0			0									1			6
21		0		0		1	0												3
22		0	0	0					0							1			9
23		1		0															
24		1	1				1									0			
25				1		1	0								0		0		
28		1	0	5			0								2		0		1
29				2			0			1					3				
30		1		3		1	1			0				1	9				2
31		1					2												
32				0						0									1
33		2																	
34		2				4	1			2					2	1	1		
Total (1-19)	222	470	79	3541	411	5137	1688	43	89	38		3		3	2350	49	363	142	329
s.e. (1-19)	60	55	8	1244	64	2392	346	7	19	8		1		1	490	6	50	22	41
Total (1-34)		479	83	3551	411	5144	1694	43	90	41		3		4	2366	52	365	142	351
s.e. (1-34)		55	8	1244	64	2392	346	7	19	8		1		1	490	7	50	22	42
Abundance (1-19)	3898	4675	1463	28614	5793	48476	23029	616	699	695		83				683	3093	1679	2589
Abundance (1-34)		4944	1711	28953	5793	48563	23112	616	707	765		83				712	3105	1679	2751

Position of the hauls in the 2021 3M EU survey

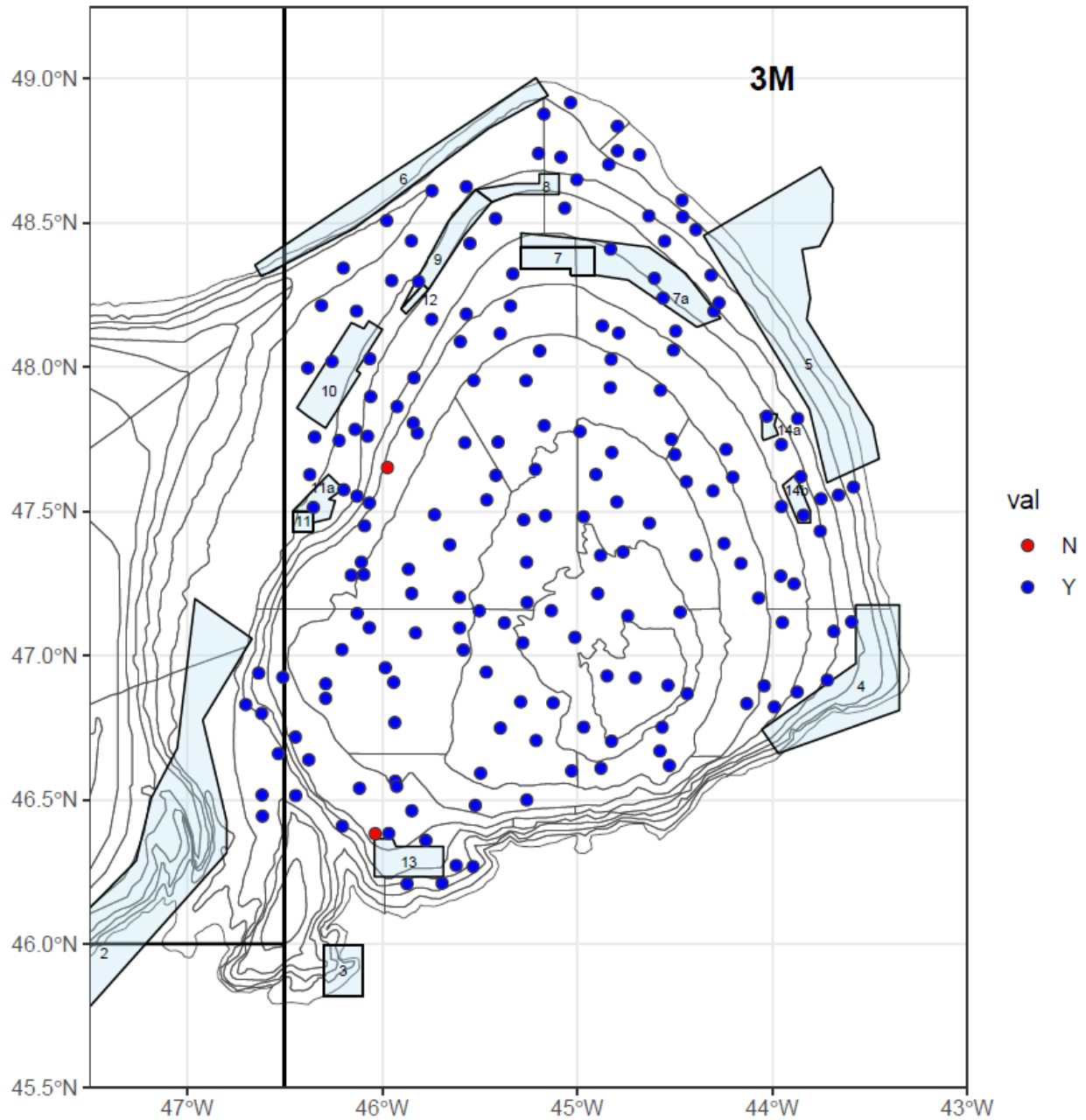


Figure 1. Haul positions in the Flemish Cap survey 2021. Coral and sponge protection areas (blue shaded) are displayed in the map.

Catch map of Atlantic cod. 3M EU survey

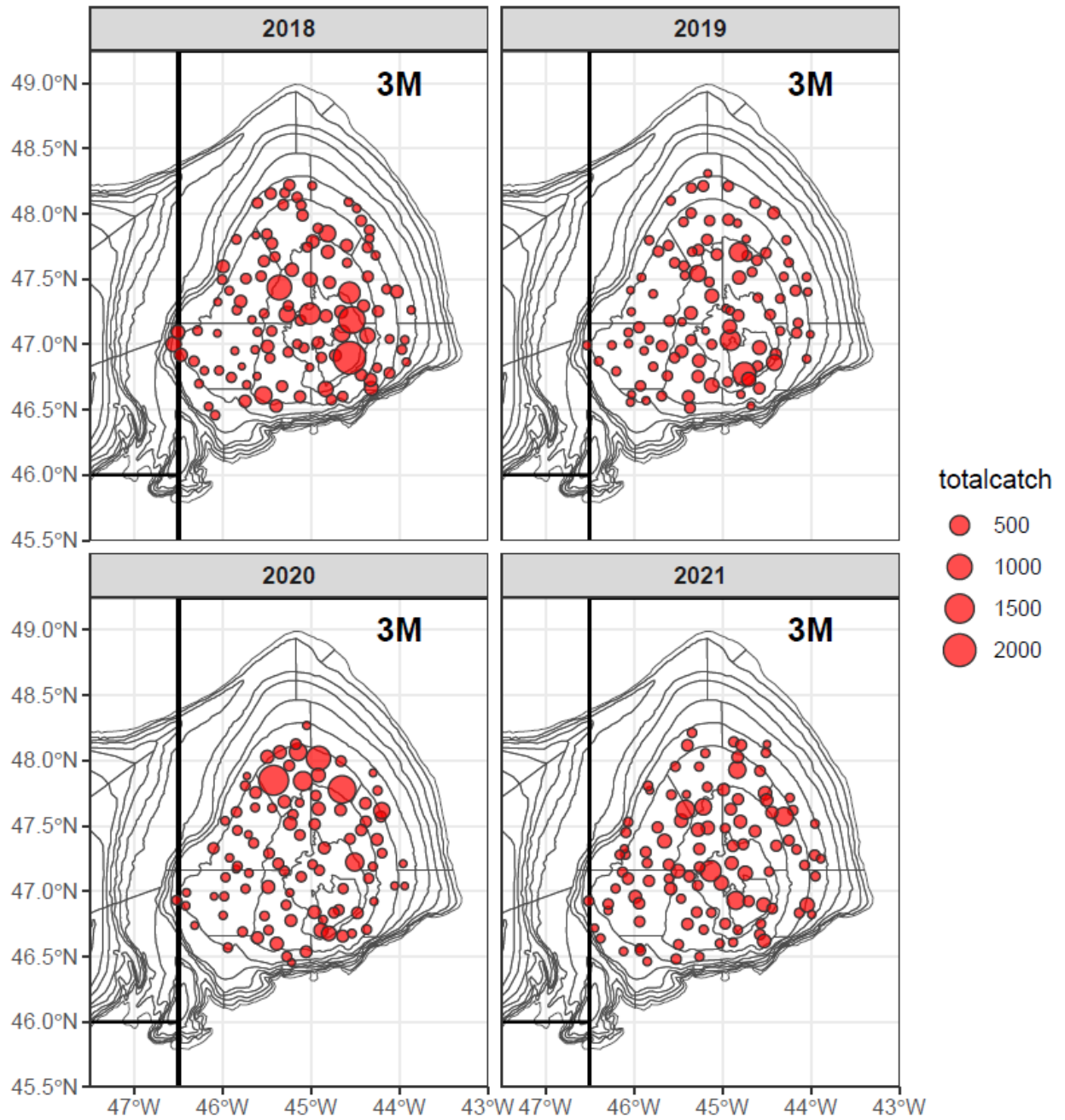


Figure 2. Cod (*Gadus morhua*) catch (kg.) distribution in the last four surveys.

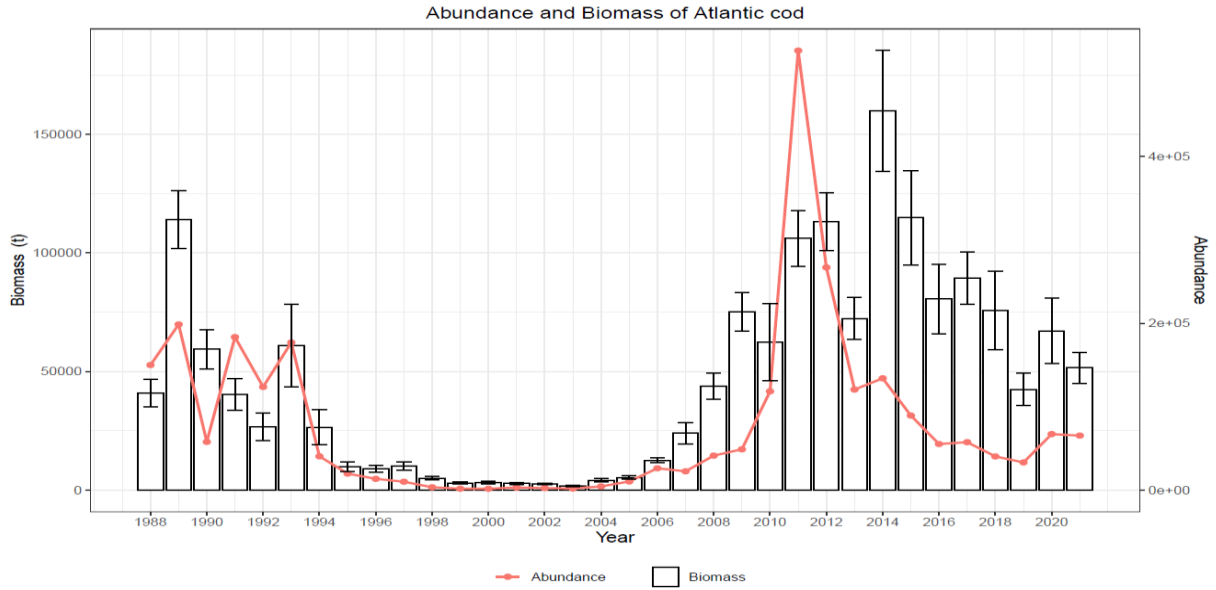


Figure 3. Cod biomass (t) ± S.E. and abundance 1988-2021.

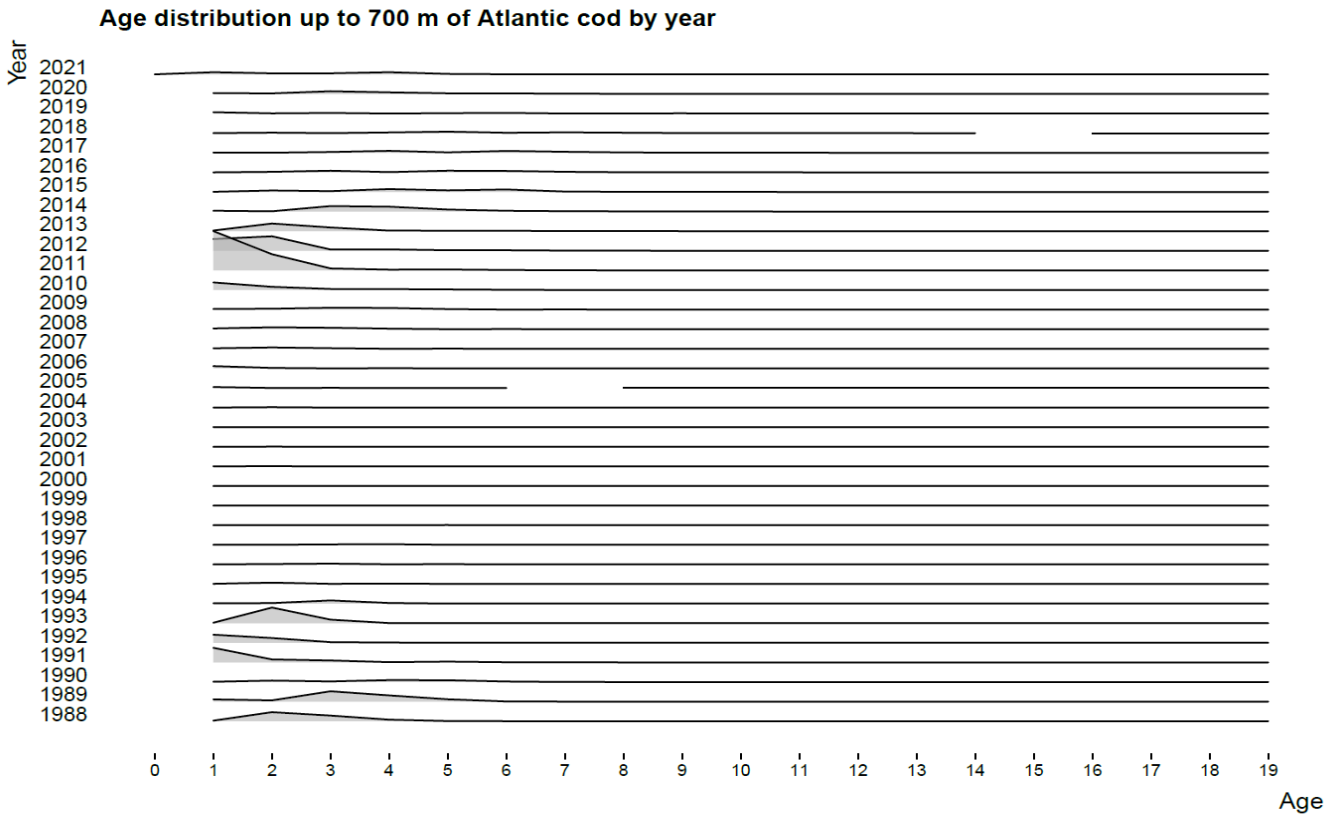


Figure 4. Cod age distribution in Flemish Cap NAFO 3M 1988-2021.

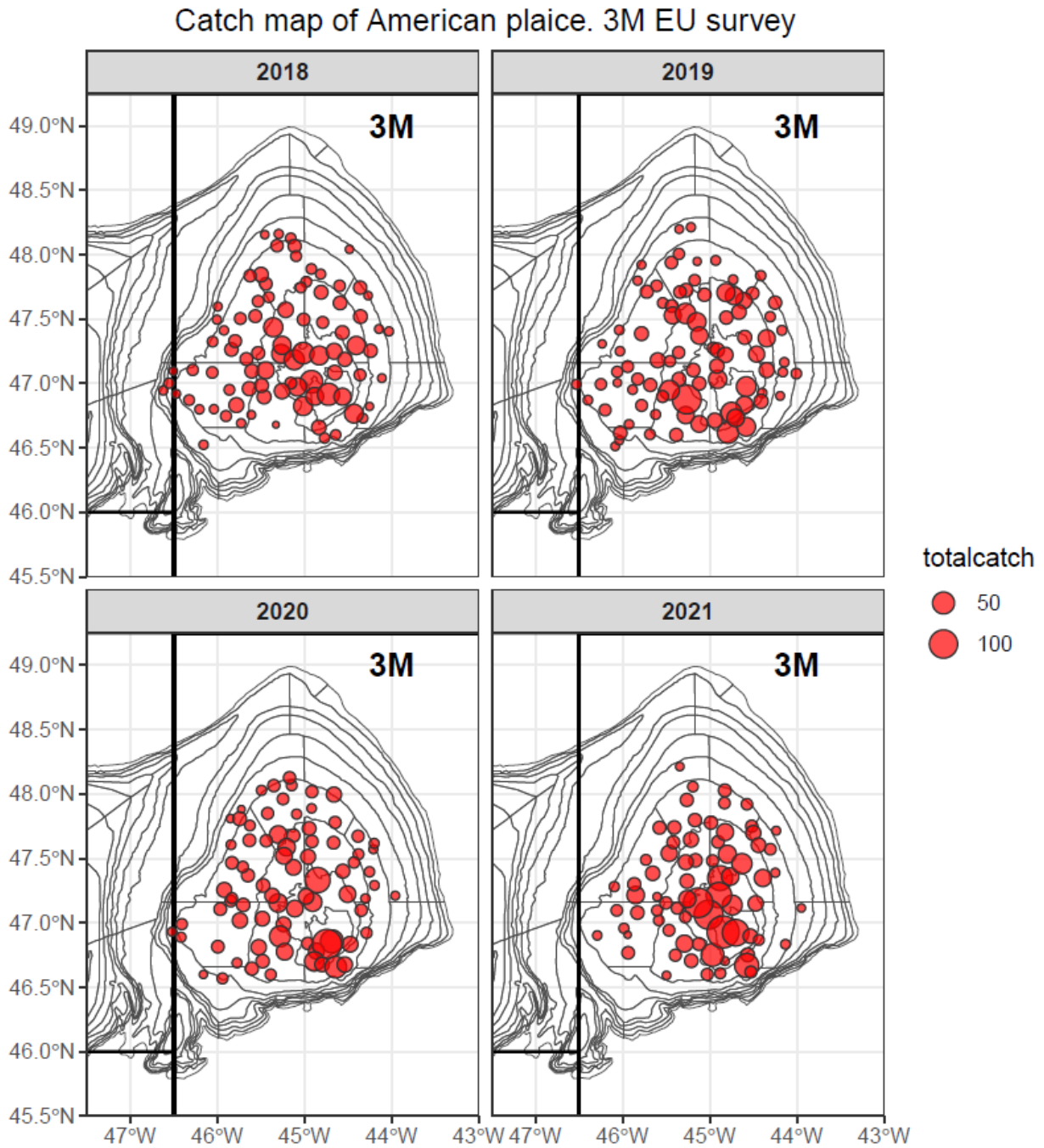


Figure 5. American plaice (*Hippoglossoides platessoides*) catch (kg) distribution in the last four surveys.

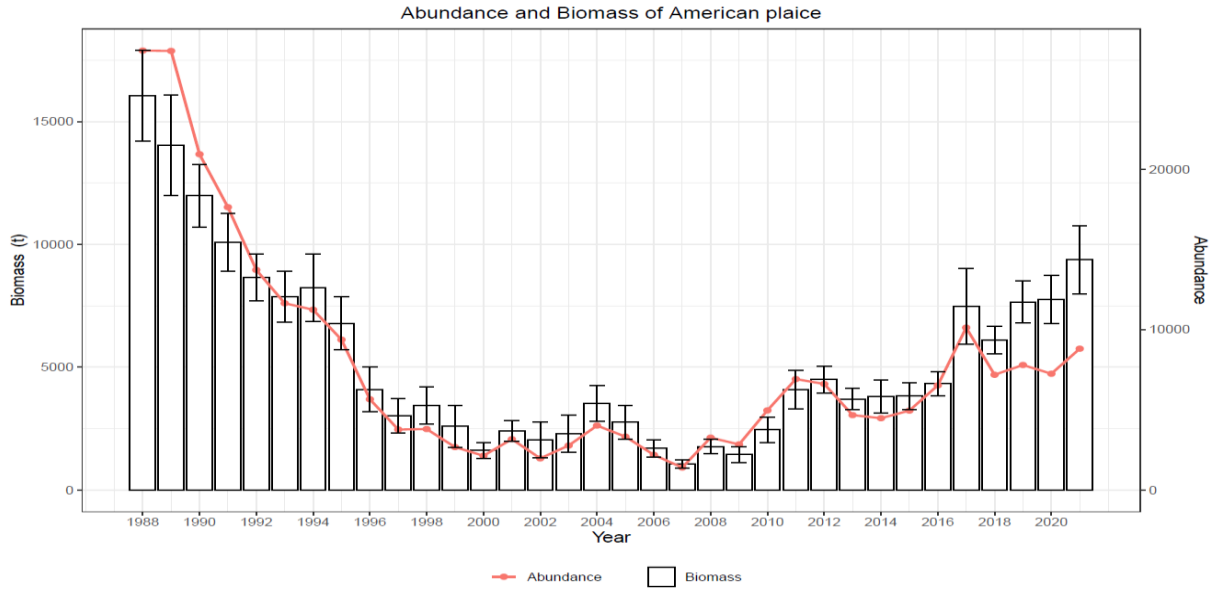


Figure 6. American plaice (*Hippoglossoides platessoides*) biomass (t.) ± S.E. and abundance 1988-2021.

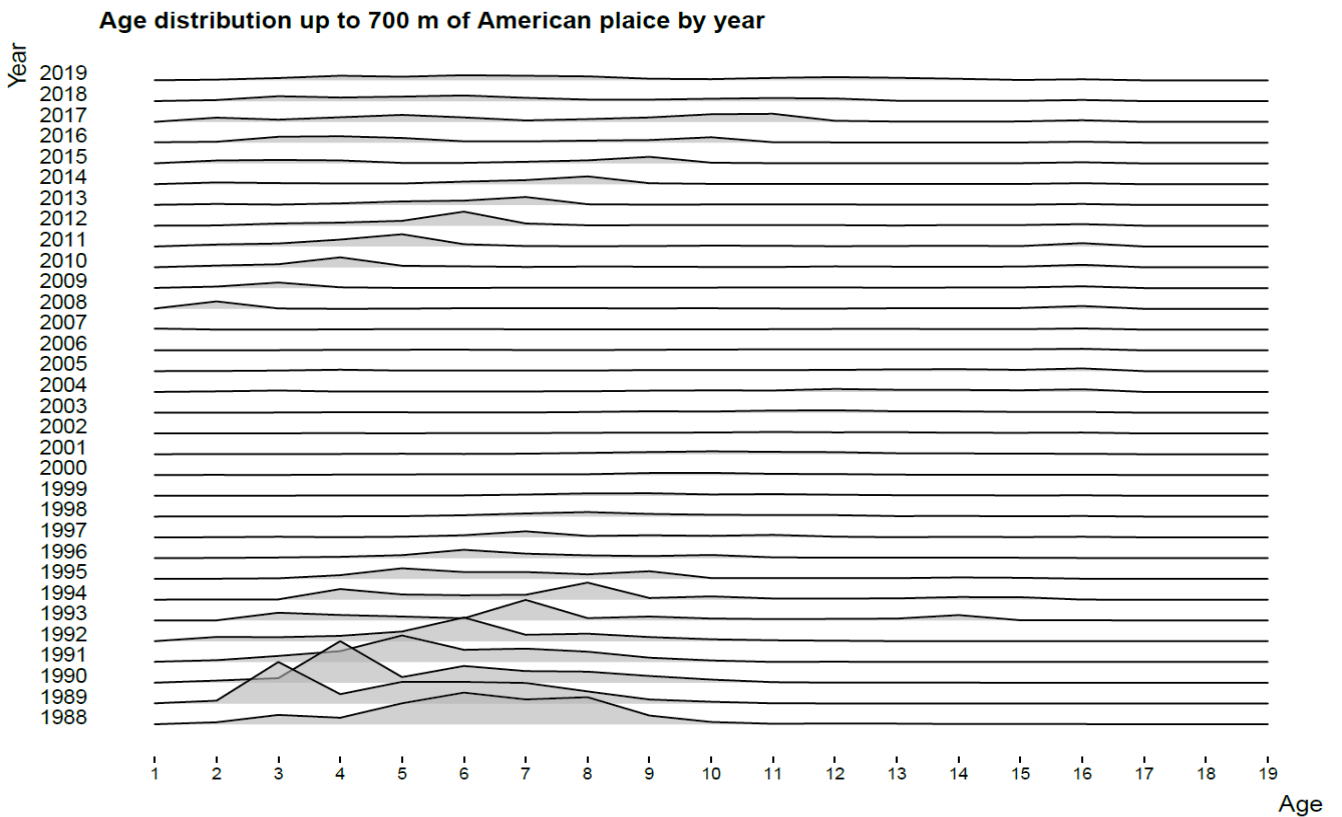


Figure 7. American plaice age distribution on Flemish Cap, NAFO Div. 3M: 1988-2021. 2020 AND 2021 NOT YET AVAILABLE.

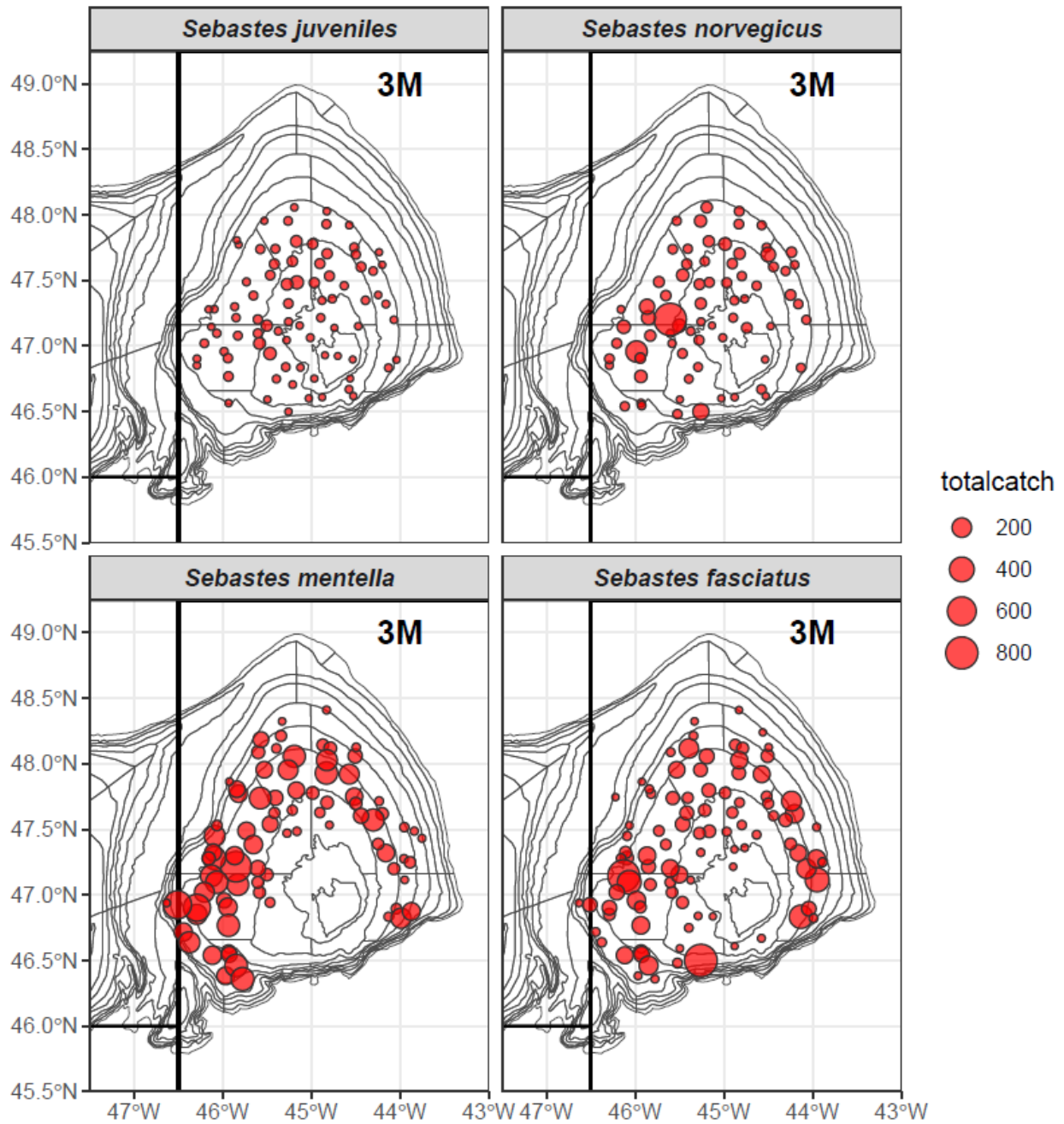
Catch map of *Sebastes* spp. 3M EU survey

Figure 8. Catch distribution (kg) of *S. norvegicus*, *S. mentella*, *S. fasciatus* and *S. juvenile* in 2021 survey.

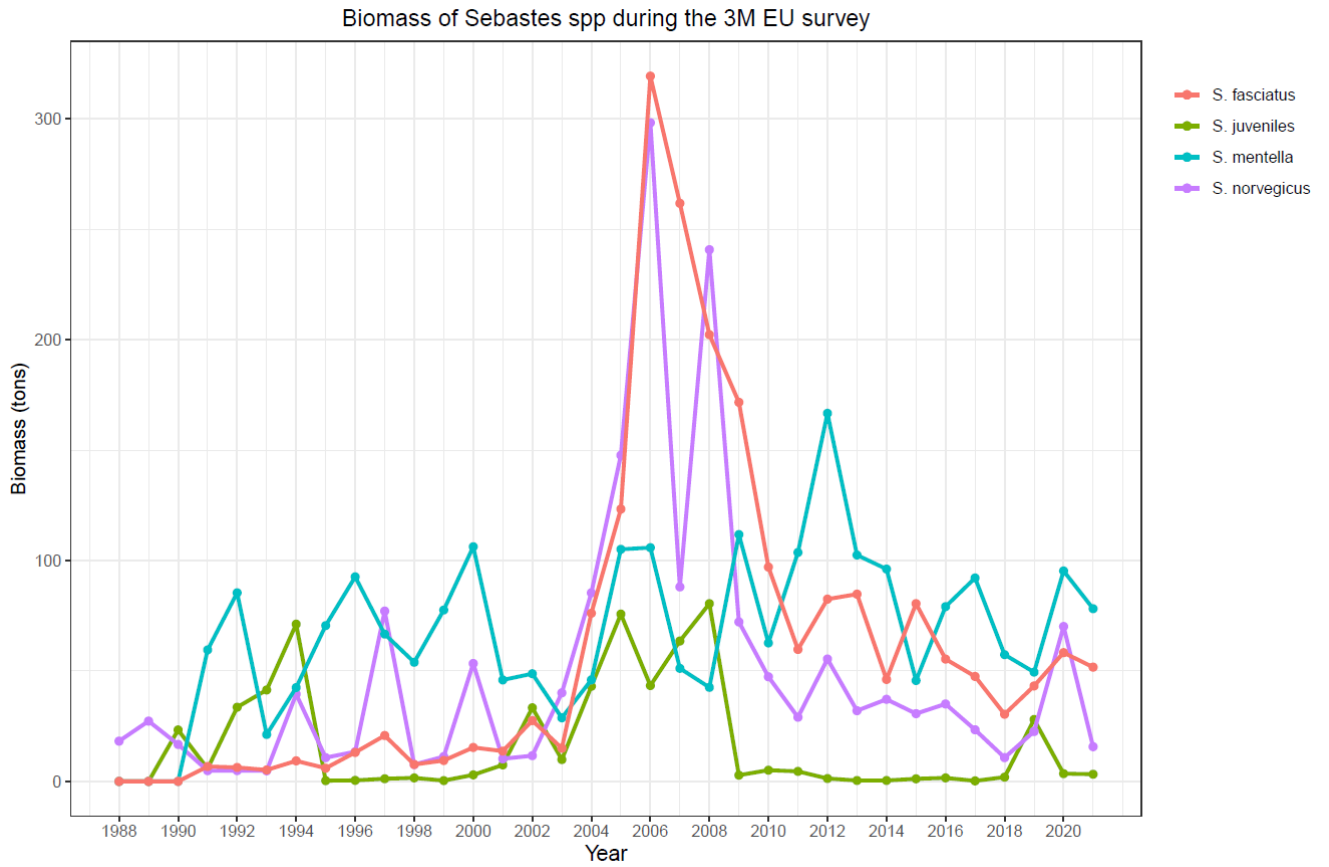


Figure 9. Redfish species biomass (t.) 1988-2021.

Catch map of Greenland halibut. 3M EU survey

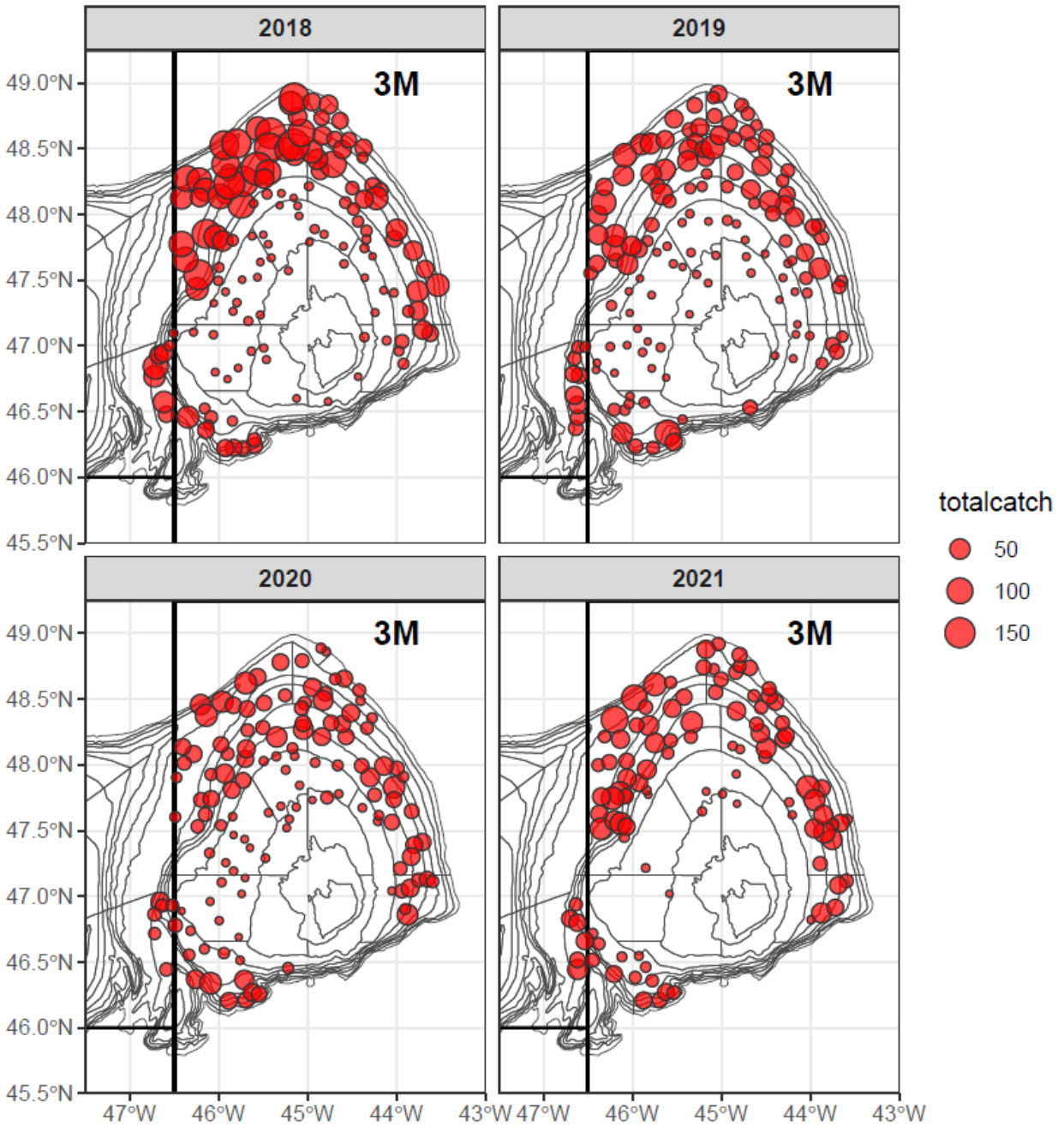


Figure 10. Greenland halibut (*Reinhardtius hippoglossoides*) catch distribution (kg) in the last four surveys.

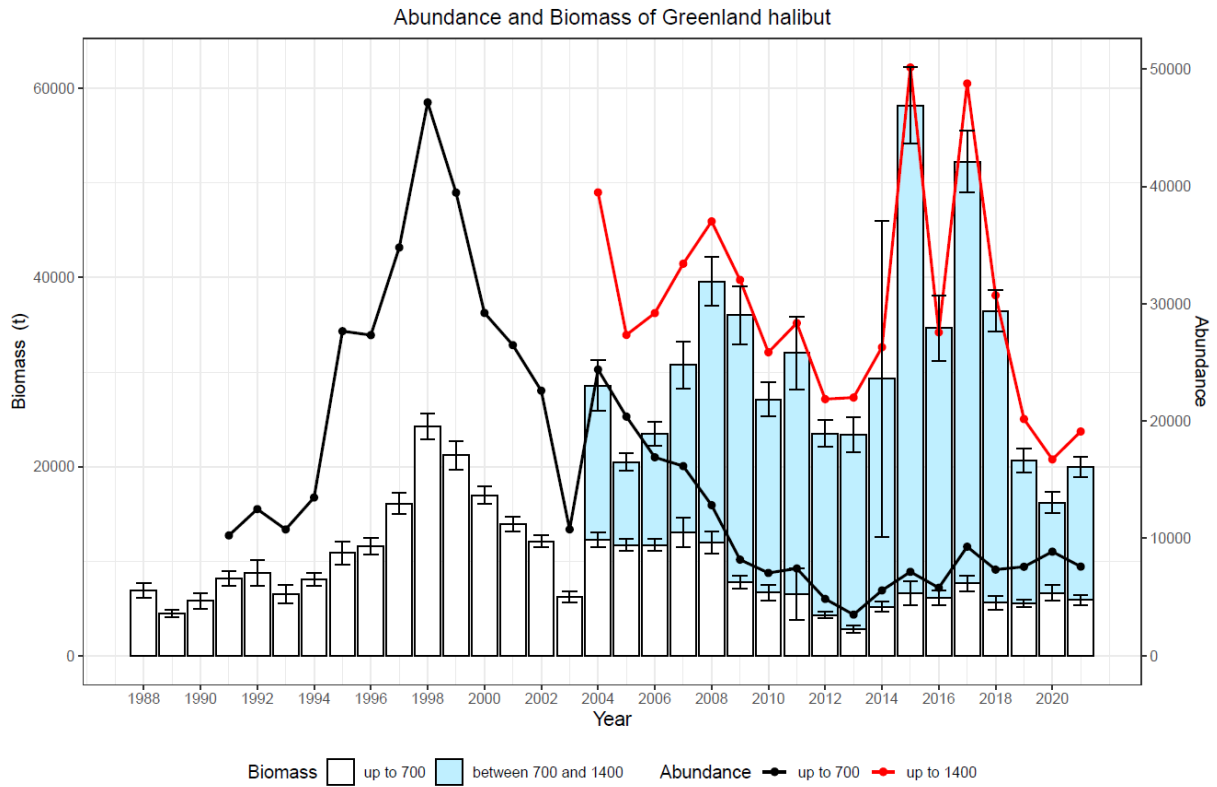


Figure 11. Greenland halibut (*Reinhardtius hippoglossoides*) biomass (t.) \pm S.E. and abundance 1988-2021.

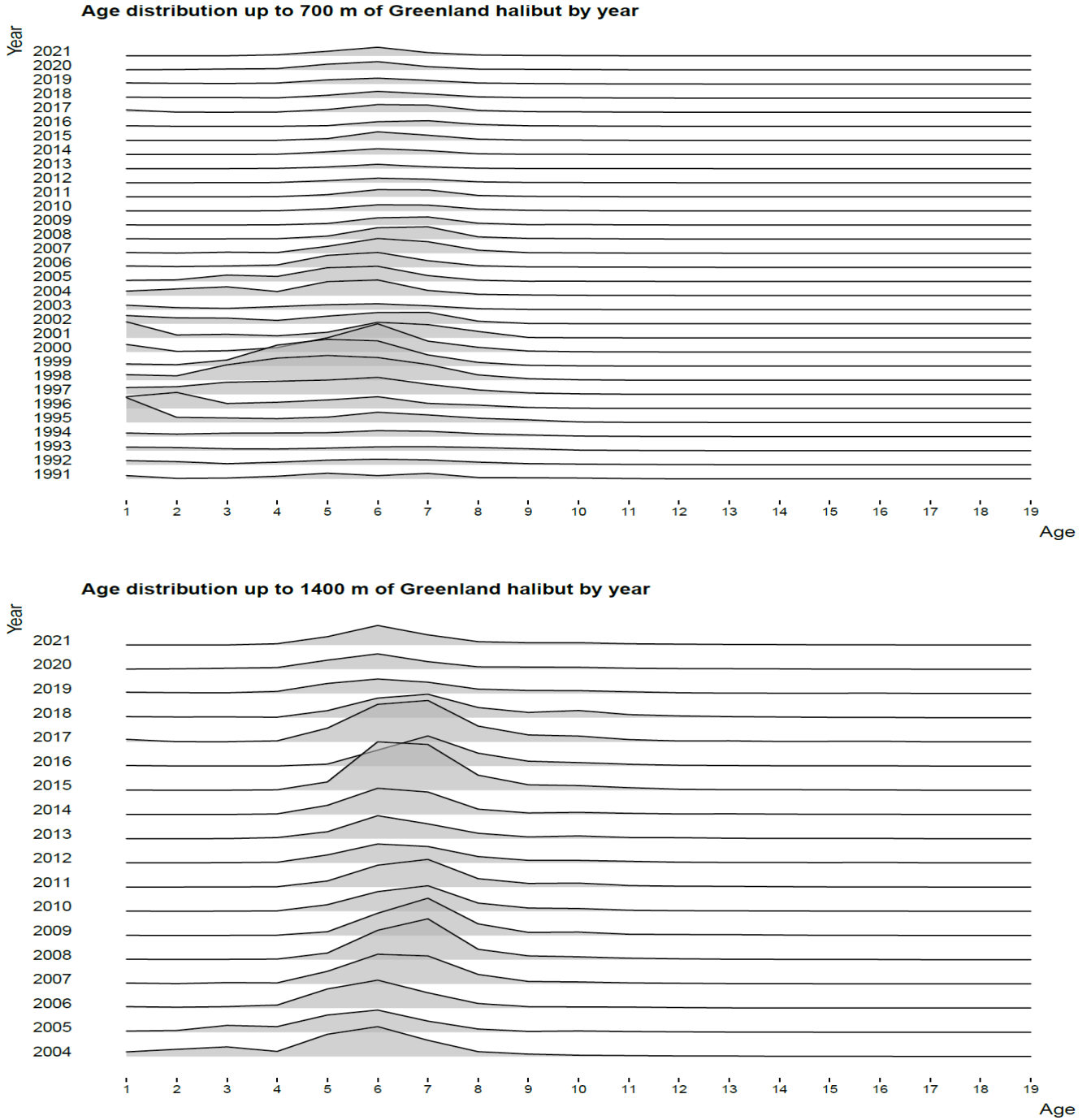


Figure 12. Greenland halibut (*Reinhardtius hippoglossoides*) age distribution on Flemish Cap in depths < 730 m (up, 1988-2021) and until 1440 m (bottom, 2004-2021), NAFO Div. 3M.

Catch map of Roughhead grenadier. 3M EU survey

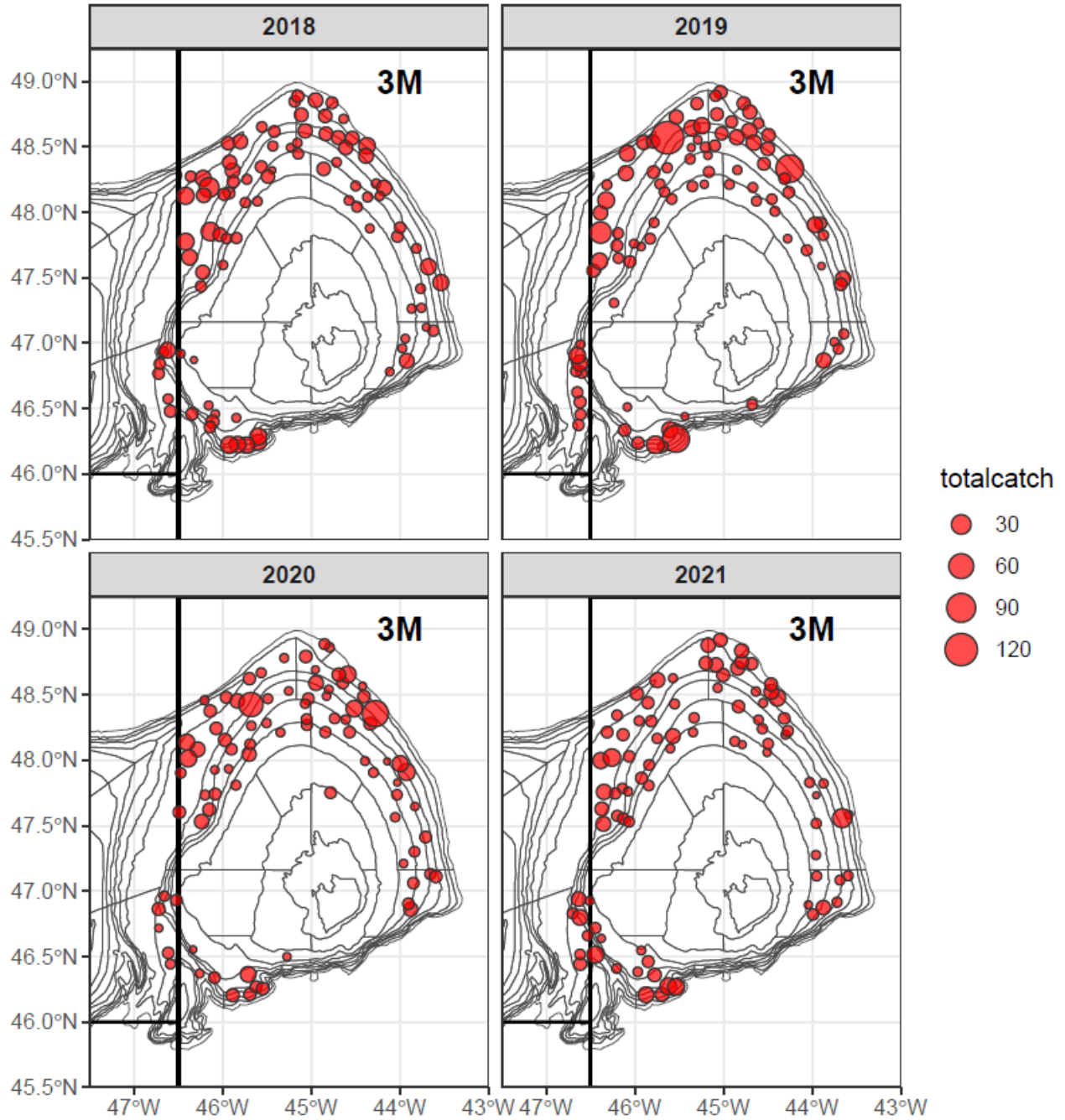


Figure 13. Roughhead grenadier (*Macrourus berglax*) catch distribution (kg) in the last four surveys.

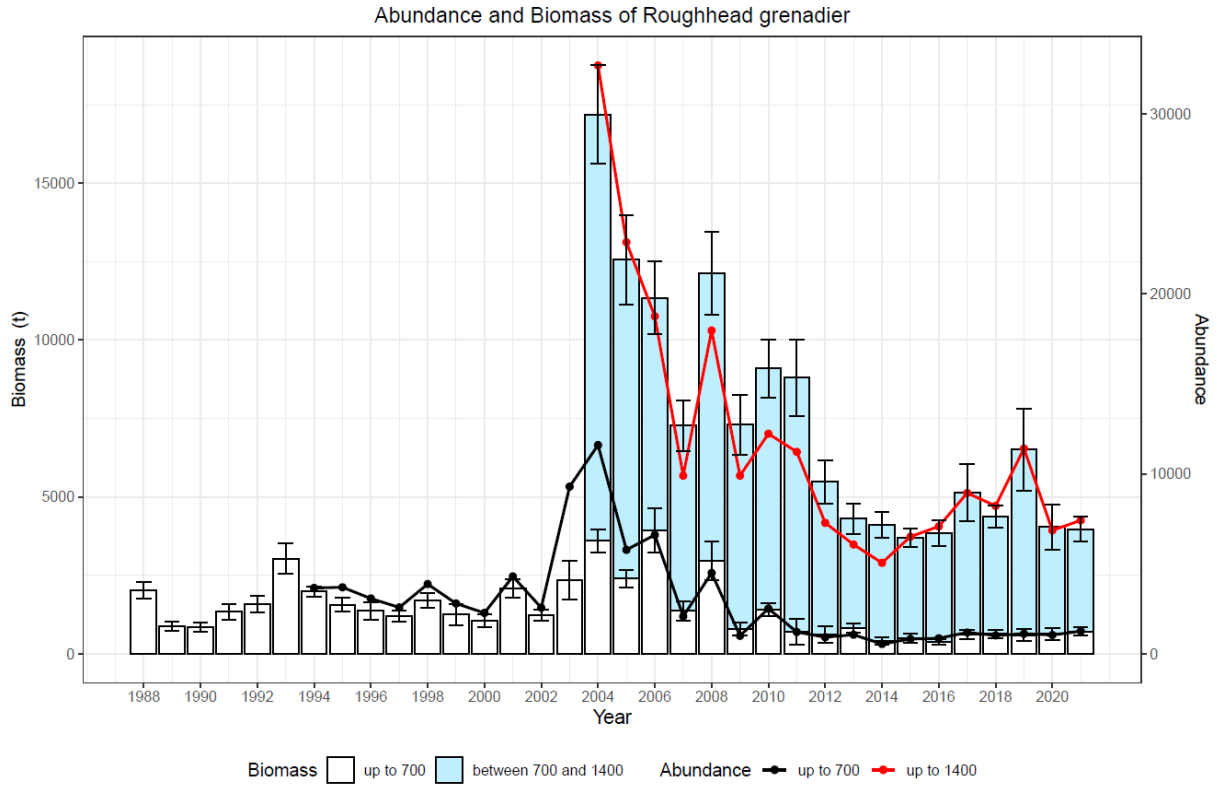


Figure 14. Roughhead grenadier (*Macrourus berglax*) biomass (t.) \pm S.E. and number ('000) 1988-2021.

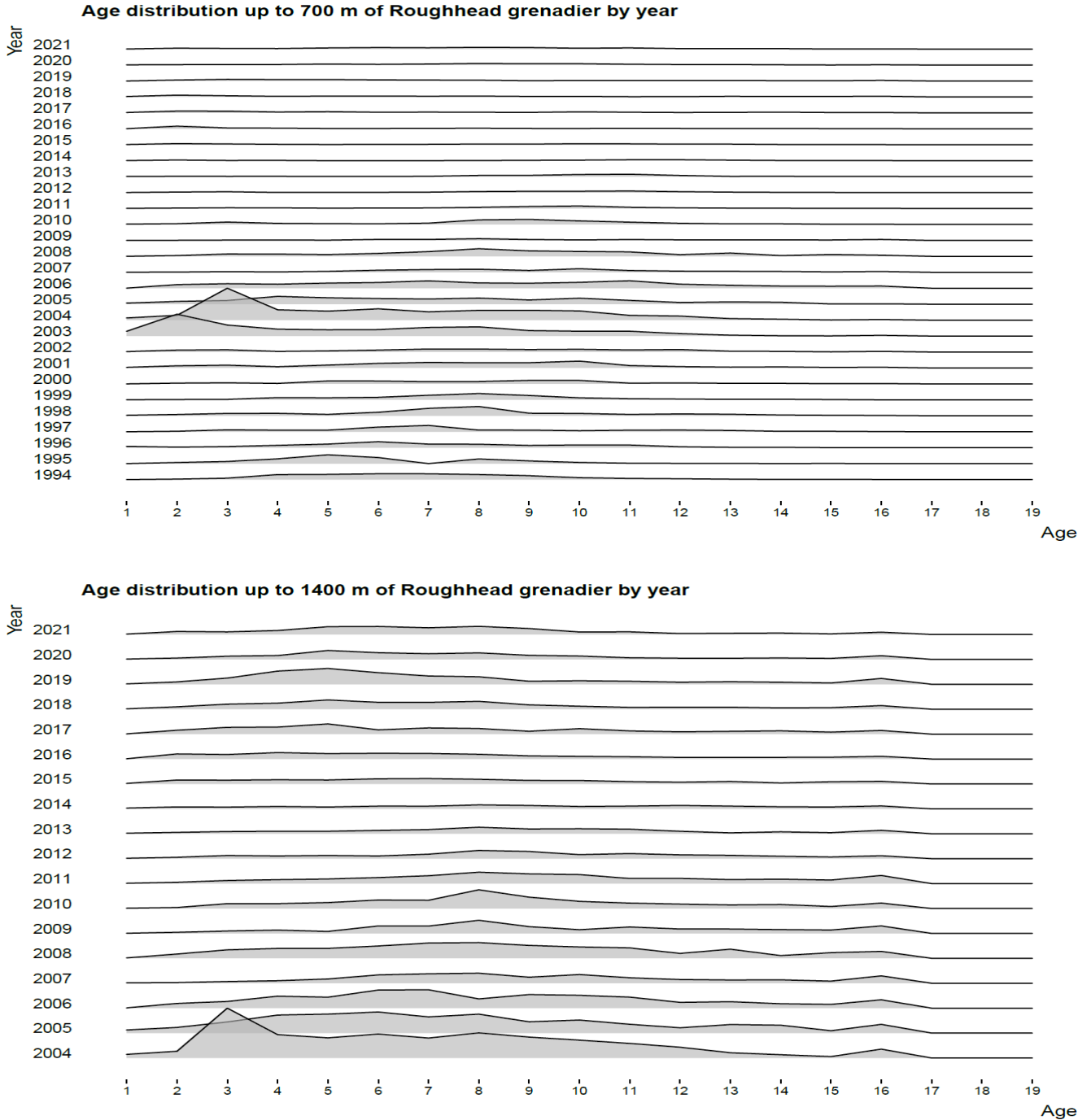


Figure 15. Roughhead grenadier (*Macrourus berglax*) age distribution on Flemish Cap in depths < 730 m (up, 1988-2021) and until 1440 m (bottom, 2004-2021), NAFO Div. 3M.

Catch map of squid. 3M EU survey

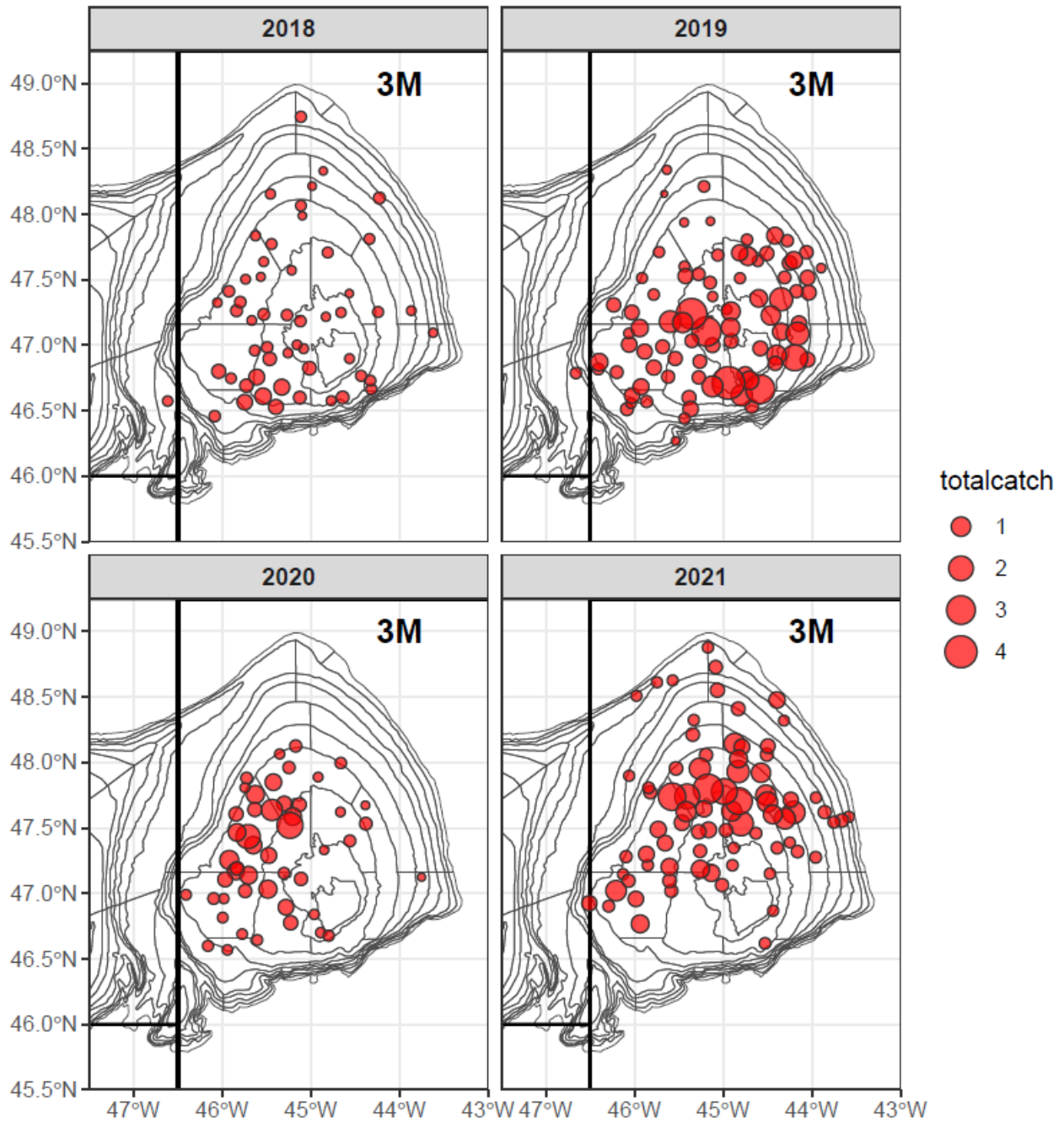


Figure 16. Squid (*Illex illecebrosus*) catch distribution (kg) in the last four surveys.

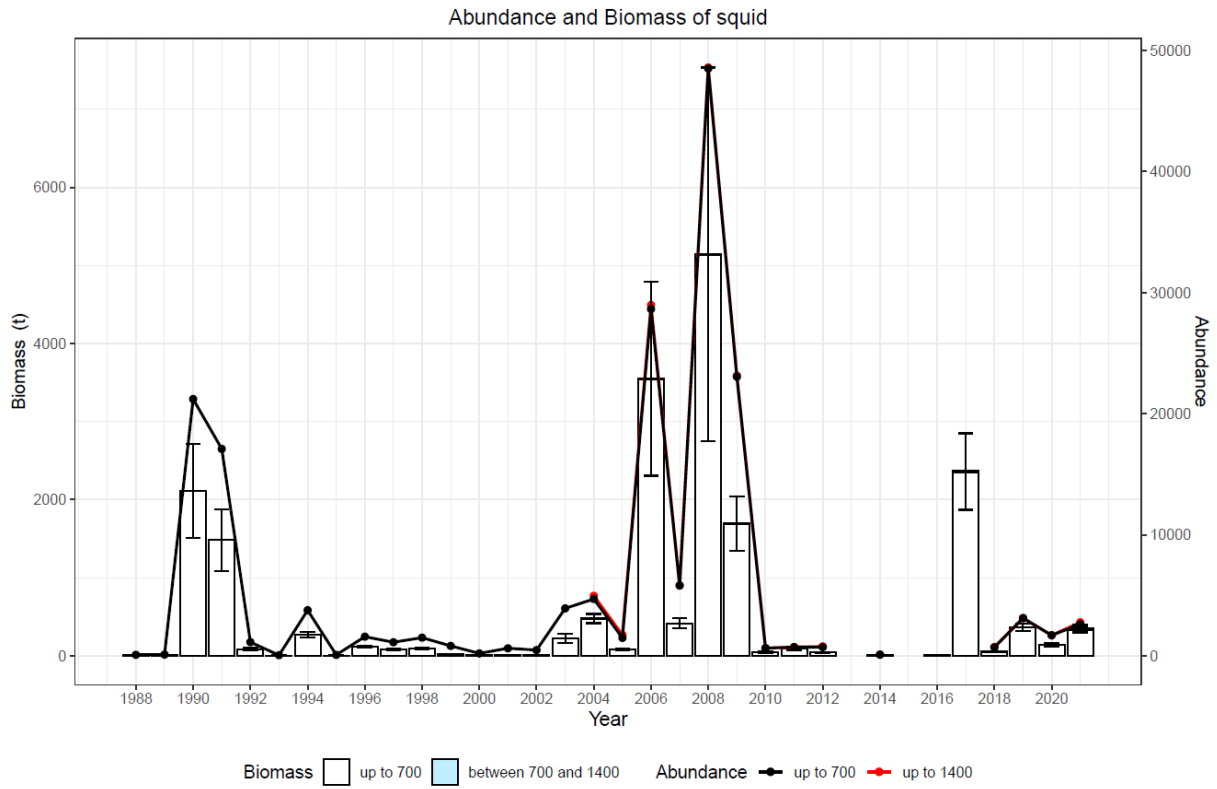


Figure 17. Squid (*Illex illecebrosus*) biomass (t.) \pm S.E. and number ('000) 1988-2021.