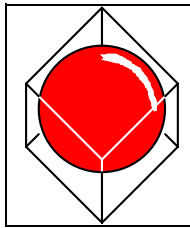


Rapport nr. Å0204

Results from Norwegian Commercial and Exploratory Fisheries on Hatton Bank in 2001



Nils-Roar Hareide, Inge Fossen & Jan Erik Dyb
Ålesund, Mars 2002



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RAPPORT

Tittel: Results from Norwegian Commercial and Exploratory Fisheries on Hatton Bank in 2001 (Norsk tittel: Resultater fra garantifisket og det norske kommersielle fisket ved Hatton Bank, 2001: fangst og fangstrater)	ISSN
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Sammendrag:

Rapporten sammenfatter biologisk prøvetaking og fangstrapportering i forbindelse med garanti fisket som ble gjennomført ved Hatton Bank sommeren 2001. Den totale innsatsen i området i form av landinger er også inkludert.

12 norske fartøy fisket i området rundt Hatton Bank i løpet av 2001. Blant disse var en tråler, en garnbåt og 10 autolinefartøyer. Foreløpige tall viser at disse fartøyene samlet landet 2908 tonn fra dette området. Blåkveite (1125), brosme (532) og blålange (409) utgjorde hovedandelen av dette, men det ble også levert fangster av blant annet ulike håarter (240), mora (166), havmus (67), isgalt (32) og skolest (32). Fisket forgikk i et vidt område fra om lag 600 til 1600 m dyp.

Rapporten er basert på et arbeidsdokument skrevet til et arbeidsgruppemøte i ICES "The Working Group on The Biology and Assessment of Deep-Sea Fisheries Resources". Rapporten foreligger av den grunn på engelsk med norske figur- og tabelltekster

Emneord:

Hatton Bank, fangstsammensetning, fangstrater, utkast, CPUE, line, trål

Distribusjon/Tilgang:

Åpen

Results from Norwegian Commercial and Exploratory Fisheries on
Hatton Bank in 2001.

*Resultater fra garantifisket og det norske kommersielle fisket ved
Hatton Bank, 2001: fangst og fangstrater.*

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Introduction

The Norwegian Directorate of Fisheries organized exploratory fishery expeditions to Hatton Bank in 1991, 1998, 1999 and 2000. The discovery of good concentrations of Greenland Halibut increased the interest in this fishery and a commercial longline fishery was established in 2000. This fishery expanded in 2001 and during this year Møre Research organized a feasibility fishery, with three longliners and one trawler on Hatton Bank (Kjerstad & al 2002). To collect fishery and biological data The Directorate of Fisheries hired in Hareide Fishery Consultants to gather information and to carry out onboard sampling. A report on the undertaking was to be prepared for ICES. This work has been carried out in co-operation with Møre Research.

Material and Methods

Official landing figures were not yet available from The Norwegian Directorate of Fisheries. Data was therefore collected from sales organizations in co-operation with The Directorate of Fisheries.

Logbooks were collected from three longliners and the trawler which participated in the feasibility study. The logbooks contain information from 19 days trawling and from 72 days longlining.

Data on total effort (days) was made available from the Directorate of Fisheries. The data was obtained from the satellite tracing system. Observers were onboard two of the longline vessels for two weeks each and sampled biological information, trained fishermen in identifying the different fish species and demonstrated the best way of processing the fish (Kjerstad & al 2002). Information on catch, discards and effort was collected during this period, and the skippers collected data on catch and effort for an additional three weeks.

To get access to catch data the skippers were promised that no exact positions would be published. Catch and effort were reported by areas as shown in Figure 1. The skippers recorded processed weight. Conversion factors (Table 1) were used to calculate live weight.

Lengths were measured as total lengths for all species except the grenadiers and *Hydrolagus spp.* which were measured as pre anal length and length to base of second dorsal fin respectively.

Maturity for bony fishes was determined in 7 stadia: 1-2 immature, 3 resting, 4 developing, 5-6 spawning and 7 spent. For the sharks, maturity was assessed by means of the maturity scale developed by Stehman (1998).

All biological data were sampled from depths between 1100 and 1600 meters. Neither of the vessels conducted a fishery between 500 and 1100 meters during the sampling period. The number of specimens examined for biological data is shown in Table 2.

Total catch and discards of all species were recorded by number from 20 longline settings. Mean weights for each species was used to calculate catch by weight. 6 settings were recorded in area 2a and 14 in area 1a. All settings were deployed in the depths between 1100 and 1600 meters.

Description of Fisheries

In 2001 one Norwegian trawler, 10 longliners and one gill-netter participated in deep-water fishery at Hatton Bank (including Edoras Bank, Fangorn Bank and George Bligh Bank) and the western slope of the Rockall Bank).

Trawl fishery

The trawler conducted two trips. Total fishing days for the trawler was 19 days.

The trawler conducted a fishery in depths from 500 to 1600 meters. The main target species were round-nose grenadier (*Coryphaenoides rupestris*), Greenland halibut (*Reinhardtius hippoglossoides*) and blue ling (*Molva dipterygia*).

Longline fishery

The longliners conducted a fishery in depths between 500 and 1600 meters. In the depth range 500 to 1100 meters the main target species were blue ling, tusk (*Brosme brosme*), mora (*Mora moro*), Portuguese dogfish (*Centroscyllium coelolepis*) and leafscale gulper shark (*Centrophorus squamosus*).

In depths between 1300 and 1600 meters the main target species was Greenland halibut. Bycatch species were rough-head grenadier (*Macrourus berglax*) and Portuguese dogfish.

Fishing in these two different depth ranges can be regarded as separate fisheries. The only overlapping commercial species is Portuguese dogfish.

The fishery for Greenland halibut is the first choice for the longliners. This species is distributed all along the western and northern slope of Hatton bank. In some areas it is found in high densities. Fishing on these concentrations gives high catch rates and profit. However, only 3-4 dense concentrations were discovered so far. The vessels which targeted Greenland Halibut spent many days searching before good concentrations were found. If they did not locate quantities of Greenland halibut they chose the second option in the shallower part of the slope. This fishery is far more predictable, but not as profitable as fishing on dense concentrations of Greenland halibut. On the other hand the catch rates of Greenland halibut drops quickly after 2-3 weeks of fishing (Figure 2).

Total number of fishing days for the longliners was 412. The effort in days, number of hooks and nets are given in Table 3. The longliners conducted 1-3 trips each.

Official landings

Preliminary figures on official Norwegian landings by ICES area have been made available by the Norwegian Directorate of Fisheries. Total Norwegian landings of deep-water species from ICES sub-area XII and division VIb are given in Table 4. Landings of ling and tusk from the traditional longline fishery targeting ling and tusk in division VIb are not included in the table.

Catch, effort and CPUE from feasibility fisheries

Trawl fishery

Total effort for the trawler was 223 hours. Most of the effort (117 hours) was conducted in area 1a. 200 hours (90%) were carried out in depths between 1000 and 1500 meters (Table 7).

Total catch was 45 tonnes and the main species was round-nose grenadier at 32 tonnes (Table 5). Catch per unit of effort by area is shown in Table 6. The table shows that area 1a and 1b gave highest CPUE values for the target species, round-nose grenadier.

Longline fishery

The total effort of the longliners participating in the feasibility fishery was 1,080,200 hooks set. The most important areas were 1a (39%) and 4b (31%). The catches amounted to 337 tons round weight. The most important species were Greenland halibut (37.6%), Portuguese dogfish (17.0%), tusk (15.1%) and *Hydrolagus* spp. (13.1%) (Table 8).

As mentioned earlier the deep-water longline fishery can be divided into two different fisheries by depth. The first of these is in waters shallower than 1100 meter and the second is in depths greater than 1300 meters. Between 1000 and 1200 meters there is no profitable fishery because the catches are composed mainly of species with low value. The main species are *Centroscymnus crepidater*, *Centroscyllium fabricii* and *Etmopterus princeps*. (Langedal and Hareide 1999 and 2000) CPUE has been calculated for the two “commercial depth strata”.

Most longline vessels targeted Greenland halibut, at least for the first 5-10 days of a trip. The strategy was to fish along the slope at the correct depths and temperatures (< 4.5° C) until they found profitable concentrations of Greenland Halibut. If they were successful they then fished directly on the Greenland Halibut concentration until the end of the trip or until the fishing declined. An example of this fishery is shown in Figure 2. If good concentrations of Greenland halibut were not found after 5-10 days the vessel changed to shallower water or left the area. An example of one vessel that moved to shallower water is shown in Figure 3.

The two different longline fisheries at Hatton are defined by depth/temperature and target species. In Tables 11 – 13 trawl data is used to illustrate changes in catch per unit of effort by depth for the species Greenland halibut, blue ling and round nose grenadier.

Biological data

Information on length and weight for the most important species is presented in Table 14.

Greenland Halibut

Length distributions were collected during the feasibility fishery. The total length varied between 57 and 103 cm. The mean length was 83.4 cm. Total weight varied between 1.85 kg and 13.5 kg. Mean weight was 7.2 kg. Length distributions are presented in Figure 4 and Table 15. 95 % of the Greenland halibuts were found in the sexual maturation stage 3 (resting) and the remaining were recorded as stage 2 (Figure 5). Old sterile individuals were also found. Spawning specimens were observed during fish processing, but not during sampling.

Portuguese dogfish

The total length varied between 72 and 122 cm. The mean length was 101.9 cm. Total weights varied between 2.44 kg and 17.70 kg. Mean weight was 9.25 kg. Length distributions are presented in Figure 6 and Table 15.

Discards

The species compositions and discards are shown in Tables 15-17. The discard by weight represented 47% and 43% of total catch in areas 1a and 2a respectively. The sampling was carried out during the first two weeks of the feasibility fishery and hence before dense concentrations of Greenland halibut was found. The catch compositions therefore do not reflect the real situation in commercial fishery and can not be used to calculate total discard in the fishery.

The CPUE figures for each species (Tables 16-18), however give more reliable information on discards. We have therefore raised the CPUE for each discards species for all areas combined (Table 16) by the total effort in depth strata 1100 – 1600 meters (Table 3). Total discard in this interval was estimated to be 429 tons (Table 19).

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Figures – Figurer

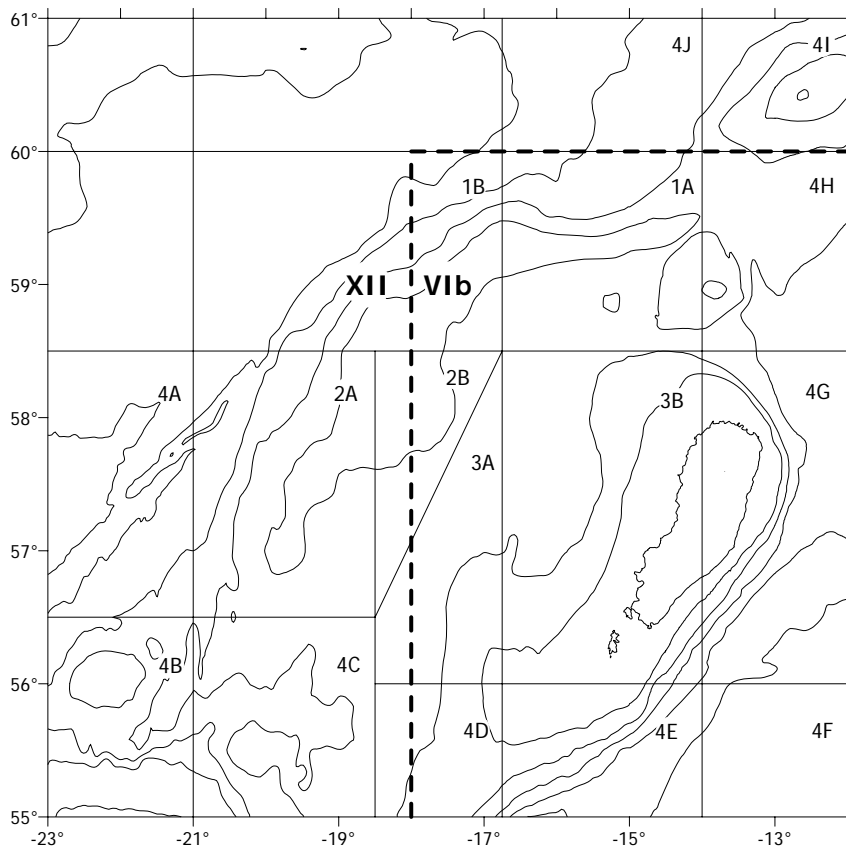


Figure 1 Hatton bank and Rockall. Areas (1A-4J) for reporting during feasibility fishery in 2001, ICES sub-area XII and division VIb are indicated.

Figur 1 Kart med dybdeanmerkning over Hatton Bank og Rockall. Fangstene rapportert fra ulike deler av banken (1A – 4I). Grensen mellom ICES sub-område XII og divisjon VIb er indikert.

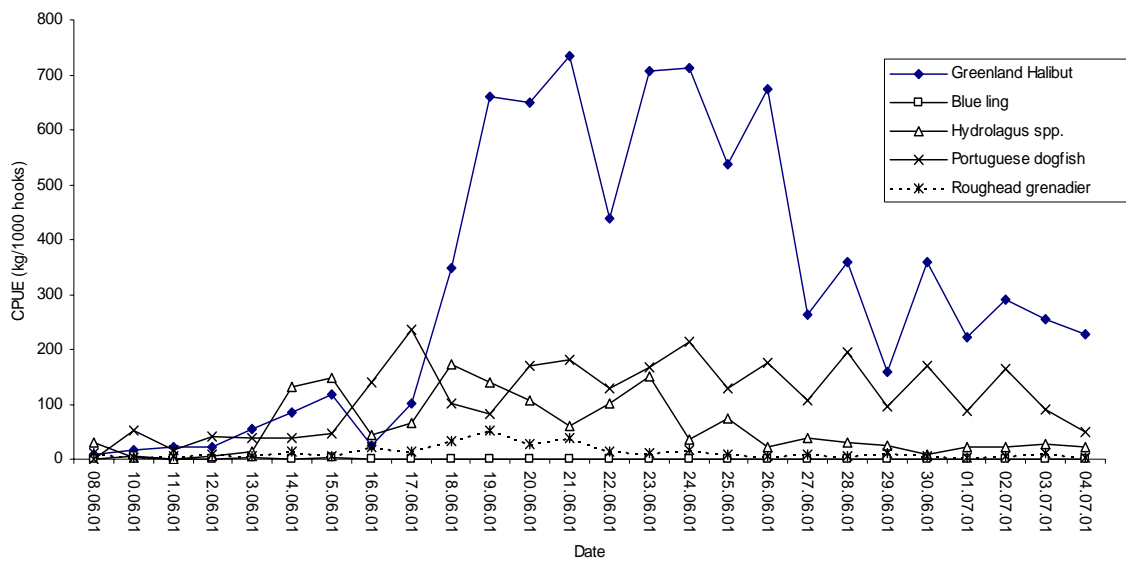


Figure 2 CPUE for one longline vessel fishing in depths between 1200 and 1600 meters. The period between June 8 and June 17 was used for searching. The vessel found good concentrations of Greenland halibut and fished on these concentrations between June 18 and July 4.

Figur 2 Fangstrater (CPUE) for en linebåt under fiske på dyp fra 1200-1600 m. Perioden fra 8 – 17 juni ble brukt til leting. Fartøyet fant en god konsentrasjon av blåkveite og fisket på denne fra 18 juni til 4 juli.

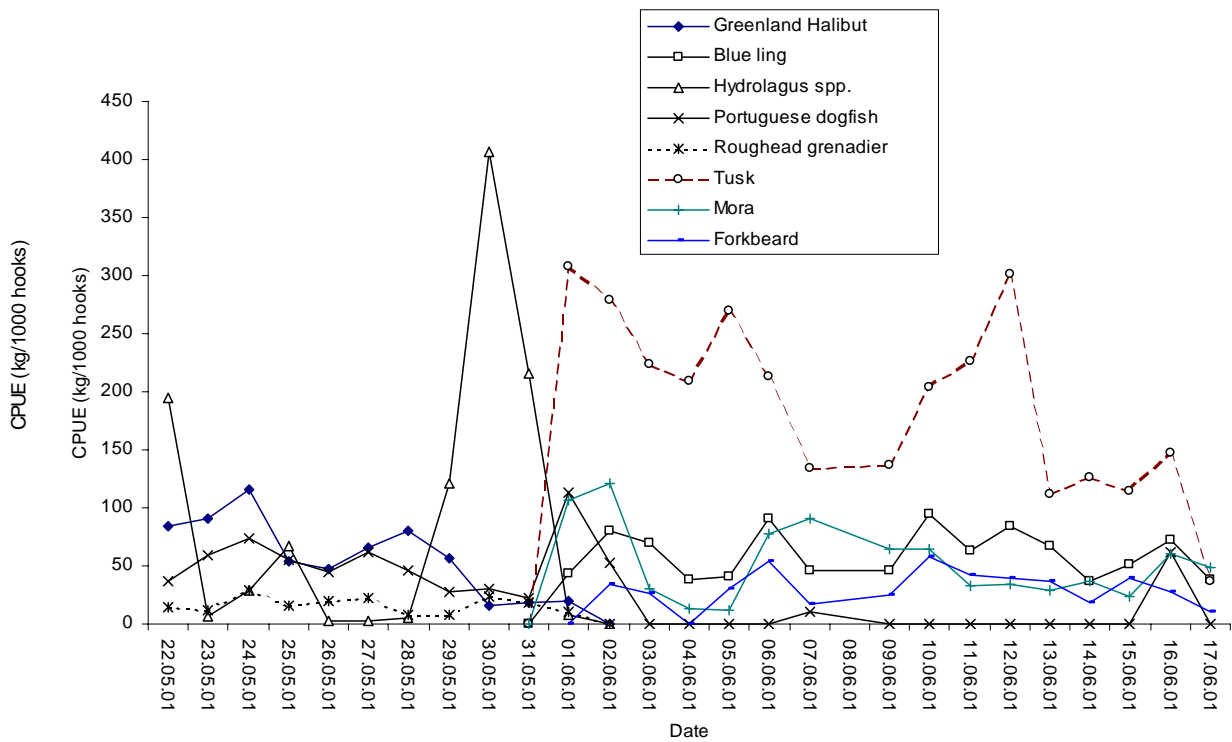


Figure 3 CPUE for one longline vessel fishing in depths between 1200 and 1600 metres. The period between May 5 and May 30. No good concentrations of Greenland Halibut was found and the vessel switched to depths between 500 and 1000 meters.

Figur 3 Fangstrater (CPUE) for en linebåt under fiske på dyp fra 1200-1600 m. Perioden fra 5 – 30 mai ble brukt til leting uten å finne konsentrasjoner av blåkveite. Fartøyet gikk da over til å fiske på dyp mellom 500 og 1000 m.

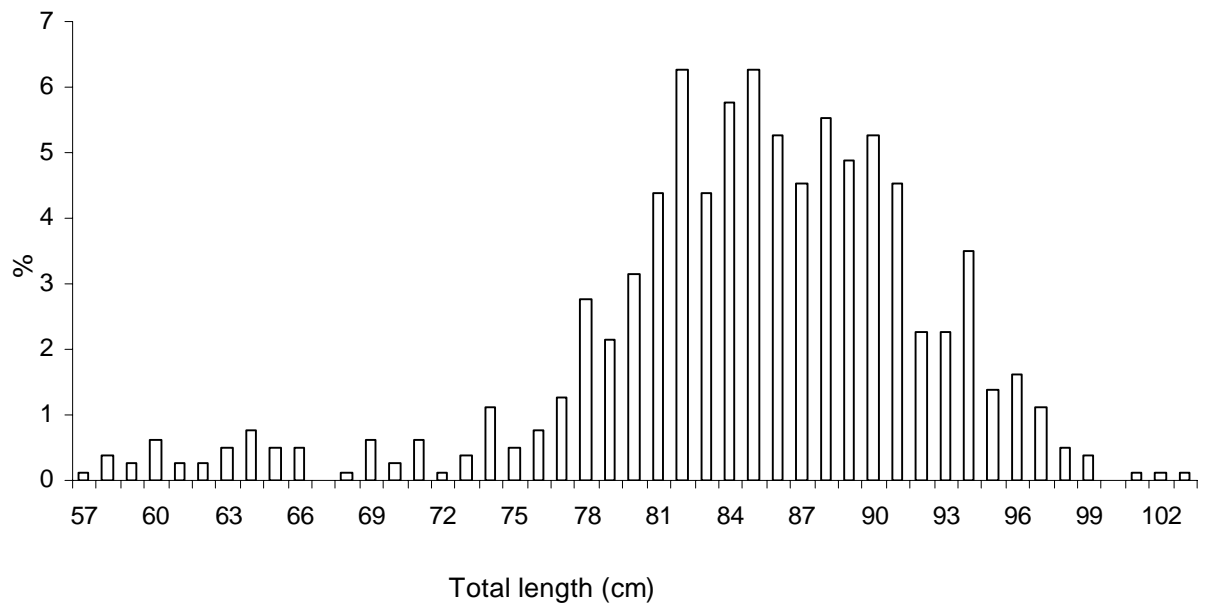


Figure 4 Greenland halibut, length distribution Hatton Bank 2001 (n=797).

Figur 4 Blåkveite, lengdefordeling i linefangster under garantiperioden (n=797).

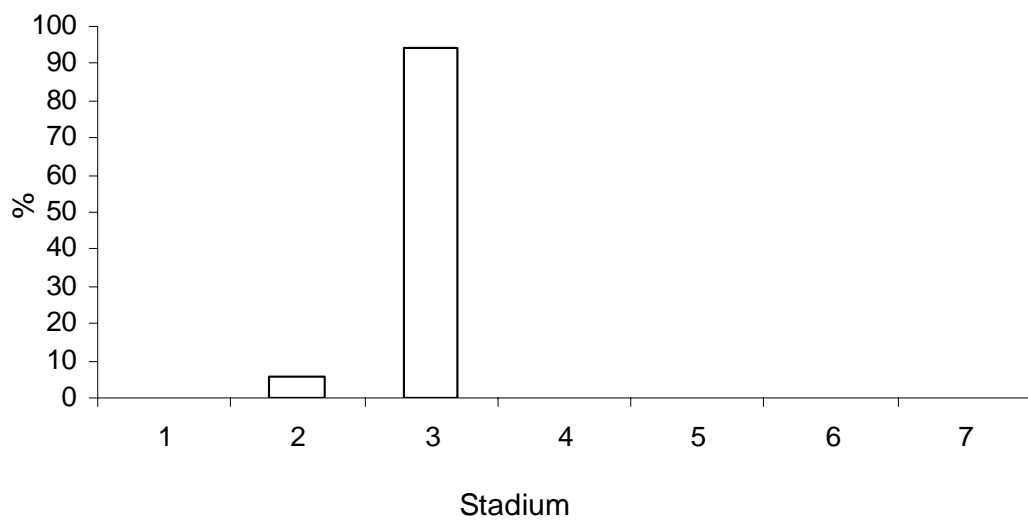


Figure 5 Greenland halibut, distribution of maturity stages for females (n=146).

Figur 5 Blåkveite, andel individer i ulike modningsstadier i linefangster under garanti garantiperioden (n=146).

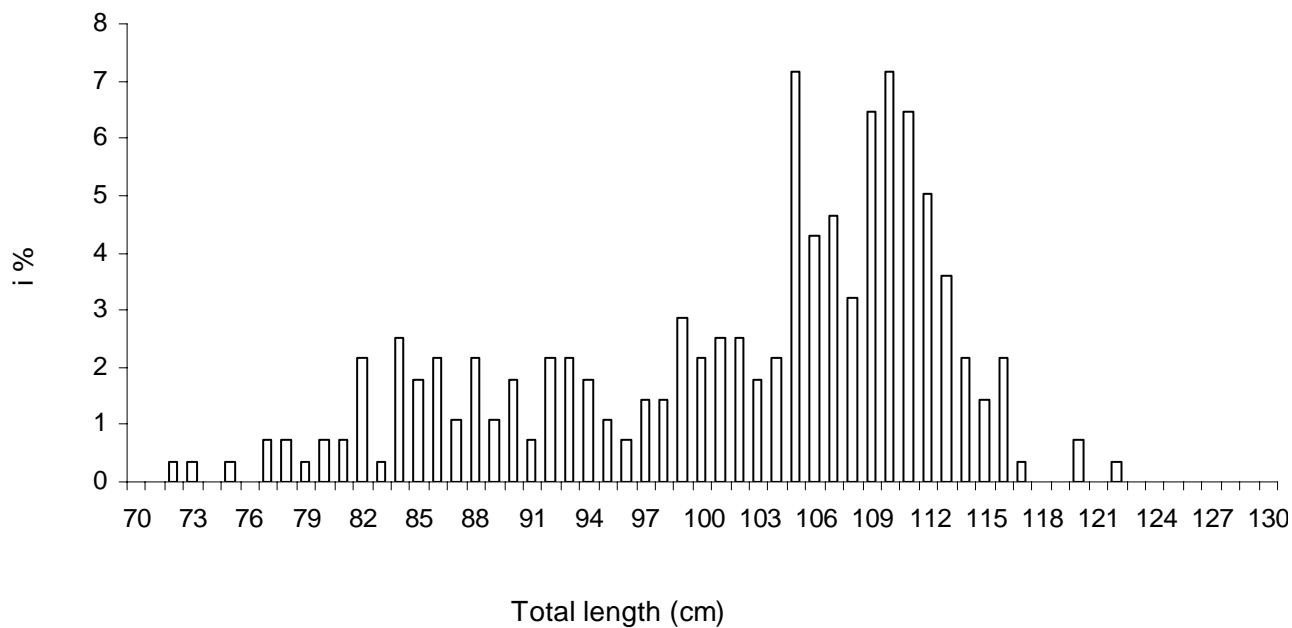


Figure 6 Portuguese dogfish, length distribution Hatton Bank 2001 (n=279).

Figur 6 Dypvannshå, lengdefordeling i linefangster under garantiperioden (n=279).

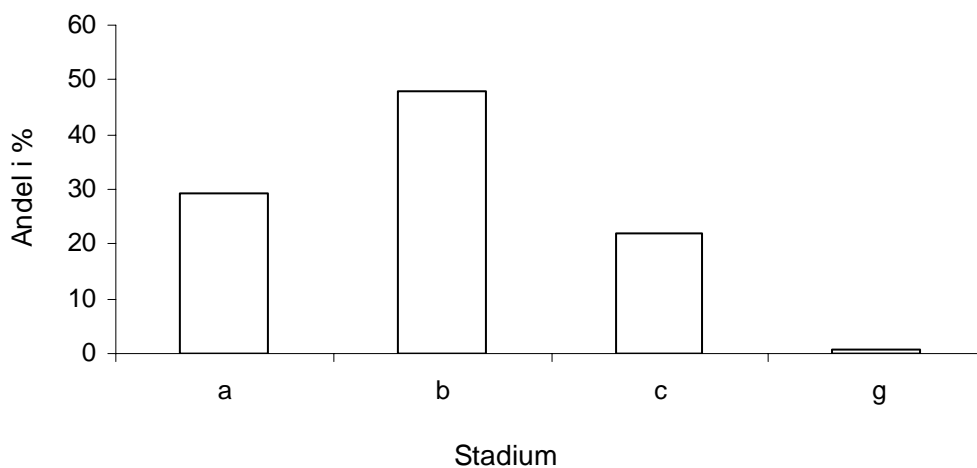


Figure 7 Portuguese dogfish, distribution of maturity stages for females (n=120)

Figur 7 Dypvannshå, andel hunnfisk i ulike modningsstadier i linefangster under garanti garantiperioden (n=120).

Tables - Tabeller

Table 1 Conversion factors for different products. (Pers. Information Møre Research)

Tabell 1 Omregningsfaktorer fra ulike produkter til rundvekt for ulike arter (Data fra Møreforskning)

Species	Product	Conversion factor to round weight
Greenland halibut	Headed & gutted	1,43
Blue ling	Headed & gutted	1,40
Rabbitfish	H&G, tail off	3,20
Portuguese dogfish	Backs, skin off	4,40
Leafscale gulper shark	Backs, skin off	4,40
Rough-head grenadier	H&G, tail off	2,24

Table 2 Number of biological samples.

Tabell 2 Oversikt over antall registreringer av ulike biologiske prøver for ulike arter.

Art	Species	Length	Round weight	Sex	Stadium
Blå antimora	A. rostrata	43	-	-	-
Blåkveite	R. hippoglossoides	797	125	146	146
Blålange	M. dipterygia	12	-	10	10
Havmusarter	Hydrolagus spp.	38	-	-	-
Brunhå	C. squamosus	12	4	5	4
Dypvannshå	C. coelolepis	279	152	177	120
Isgalt	M. berglax	186	-	50	50
Islandshå	C. fabricii	652	-	78	-
	Lepidion Schmidtii	17	9	14	14
Storsvarthå	E. princeps	221	-	86	-

Table 3 Norwegian longliners, total effort by target species and depth.

Tabell 3 Norske linebåters totale innstats i området fordelt på målarter og dybdeintervaller.

Target species	Depth	Days	Hooks per day	Total hooks (mill)
Greenland halibut	1100 -1700m	258	14300	3.689
Blue ling & tusk	500-1100 m	154	16500	2.541
Total		412		6.230

Table 4 Preliminary Norwegian official landings (tonnes round weight) from deep-water fisheries in ICES sub-area XII and division VIb. Landings of ling and tusk from traditionally longline fishery targeting ling and tusk in division VIb are not included in the table.

Tabell 4 Foreløpige norske landinger (tonn rundvekt) fra dyphavsfiskeriet i ICES underområde XII og divisjon VIb. Landinger av brosme og lange fra tradisjonelt fiske rettet mot disse artene i VIb er ikke inkludert i tabellen.

Species	VIb	XII	Total
Deep water sharks	84	156	240
Greenland halibut	316	809	1125
Blue ling	256	153	409
Tusk	475	57	532
<i>Hydrolagus</i> spp.	51	16	67
Rough-head grenadier	26	9	35
Mora	72	94	166
Greater forkbeard	35	9	44
Round-nose grenadier	31	1	32
Unspecified fish	17	15	32
Total	1447	1461	2908

Table 5 Trawl, catch (kg round weight) and effort (hours) from feasibility fishery by areas at Hatton Bank, 2001.

Tabell 5 Trål data angående fangst (kg rundfisk) per art og samlet innsats (tråltid) i ulike områder under garantifisket ved Hatton Bank.

Area	1a	1b	2a	2b	3a	3b	4d	4e	Total
Effort (hours)	117	19	36	3	16	18	11	2	223
Greenland halibut (blåkveite)	1300	350	200		50			0	1900
Blue ling (blålange)	500	100	100		300	100	50	0	1150
<i>C. crepidater</i> (bunnhå)	1600	150	150		150	100	250	0	2400
Black scabbard (dolkefisk)	500					100	100	0	700
Portuguese dogfish (dypvannshå)	1650	150	300	150	100	50	50	0	2450
<i>Hydrolagus</i> spp. (havmus arter)	50				50			0	100
Round-nose grenadier (skolest)	23520	3300	780	100	700	2500	700	0	31600
Smooth head (glatthode fisk)	4550	200						0	4750
Total	33670	4250	1530	250	1350	2850	1150	0	45050

Table 6 Trawl, catch (kg round weight) per unit of effort (hours) from feasibility fishery by areas at Hatton Bank, 2001.

Tabell 6 Tråldata, fangst per enhet innsats (kg rundvekt / tråltid) i ulike områder for ulike arter under garantifisken ved Hatton Bank 2001.

Species	1a	1b	2a	2b	3a	3b	4d	4e	Total
Greenland halibut	11.12	18.28	5.49	0.00	3.09	0.00	0.00	0.00	8.53
Blue ling	4.28	5.22	2.74	0.00	18.56	5.54	4.59	0.00	5.16
<i>C. crepidater</i>	13.68	7.83	4.11	0.00	9.28	5.54	22.94	0.00	10.77
Black scabbard	4.28	0.00	0.00	0.00	0.00	5.54	9.17	0.00	3.14
Portuguese dogfish	14.11	7.83	8.23	50.00	6.19	2.77	4.59	0.00	10.99
<i>Hydrolagus</i> spp.	0.43	0.00	0.00	0.00	3.09	0.00	0.00	0.00	0.45
Round-nose grenadier	201.13	172.32	21.39	33.33	43.32	138.50	64.22	0.00	141.79
Smooth head	38.91	10.44	0.00	0.00	0.00	0.00	0.00	0.00	21.31
Total	287.93	221.93	41.96	83.33	83.54	157.89	105.50	0.00	202.14

Table 7 Trawl, total Norwegian effort (hours) in different areas and depths at Hattonbank 2001.

Tabell 7 Trål, total norsk innsats (tråltimer) fordelt på dyp og områder.

Depth	1a	1b	2a	2b	3a	3b	4d	4e	Total
200 - 500 m						1.8		1.4	3.2
500 -1000 m	4.3		2.5	3.0	2.0			0.8	12.6
1000 - 1300 m	35.2	18.2	15.3		9.7	16.3	6.7		101.2
1300 - 1500 m	77.5	1.0	11.3		4.5		4.3		98.5
1500 - 1800 m			7.3						7.3
Total	116.9	19.2	36.5	3.0	16.2	18.1	10.9	2.2	222.9

Table 8 Effort (hooks) and catch (kg round weight) from Norwegian feasibility fishery on Hatton Bank 2001.

Tabell 8 Innsats (antall krok) og fangst (kg rundfisk) under det norske garantifisket med line.

	Area						% of catch	Total
	1a	2a	2b	3a	4b	4c		
Effort (hooks)	416,448	159,552	13,824	41,472	333,504	115,392		1,080,192
Effort (%)	38.6	14.8	1.3	3.8	30.9	10.7		100.0
Greenland halibut (blåkveite)	7821	5269		600	109367	3635	37.6	126692
Blue ling (blålange)	16269	2182	746		35	20	5.7	19252
<i>Hydrolagus</i> spp. (havmus)	12513	3361	0	3078	15553	9668	13.1	44173
Portuguese dogfish (dypvannshå)	10060	4768	148	1692	33545	7092	17.0	57306
Rough-head grenadier (isgalt)	2242	883		710	5354	2124	3.4	11313
Tusk (Brosme)	50385	280	350				15.1	51015
Mora	12183						3.6	12183
Greater forkbeard (skjellbrosme)	8026						2.4	8026
Halibut (kveite)	3557	120					1.1	3677
Leafscale g. shark (brunhå)	490		614				0.3	1104
Skates (skater)	225	130	100	50	590	975	0.6	2070
Total	123771	16993	1958	6130	164445	23514	100.0	336810

Table 9 Effort (hooks) and catch (kg round weight) from Norwegian feasibility fishery on Hatton Bank 2001, in depths between 500 and 1000 meters.

Tabell 9 Innsats (antall krok) og fangst (kg rundfisk) under det norske garantifisket med line, på dyp mellom 500 og 1000 meter.

	Area						% of catch	Total
	1a	2a	2b	3a	4b	4c		
Hooks	265600	34500	13824					313924
Greenland halibut	183						0.19	183
Blue ling	16237	2058	746				19.52	19041
<i>Hydrolagus</i> spp.	50						0.05	50
Portuguese dogfish	2498	100	148				2.82	2746
Rough-head grenadier	70						0.07	70
Tusk	50385		350				52.02	50735
Mora	12183						12.49	12183
Greater forkbeard	8026						8.23	8026
Halibut	3557	120					3.77	3677
Leafscale g. shark			614				0.63	614
Skates		100	100				0.21	200
Total	358789	36878	15782	0	0	0	100.00	97525

Table 10 Effort (hooks) and catch (kg round weight) from Norwegian feasibility fishery on Hatton Bank 2001, in depths between 1200 and 1600 meters.

Tabell 10 Innsats (antall krok) og fangst (kg rundfisk) under det norske garantifisket med line, på dyp mellom 1200 og 1600 meter.

	Area						% of catch	Total
	1a	2a	2b	3a	4b	4c		
Hooks	150848	125052	0	41472	333504	115392		766268
Greenland halibut	7638	5269	0	600	109367	3635	52.87	126509
Blue ling	32	124	0	0	35	20	0.09	211
<i>Hydrolagus</i> spp.	12463	3361	0	3078	15553	9668	18.44	44123
Portuguese dogfish	7562	4668	0	1692	33545	7092	22.80	54560
Rough-head grenadier	2172	883	0	710	5354	2124	4.70	11243
Tusk	0	280	0	0	0	0	0.12	280
Mora	0	0	0	0	0	0	0.00	0
Greater forkbeard	0	0	0	0	0	0	0.00	0
Halibut	0	0	0	0	0	0	0.00	0
Leafscale g. shark	490	0	0	0	0	0	0.20	490
Skates	225	30	0	50	590	975	0.78	1870
Total	30582	14615	0	6130	164445	23514	100.00	239285

Table 11 Greenland Halibut CPUE (kg / hour trawling)

Tabell 11 Fangst per enhet innsats (kg / tråltime) fordelt på område og dyp i trålfisket etter blåkveite.

Depth	Area								Total
	1a	1b	2a	2b	3a	3b	4d	4e	
200 - 500 m						0,0		0,0	0,0
500 -1000 m			20,0	0,0	0,0			0,0	4,0
1000 - 1300 m	4,3	19,3	0,0		0,0	0,0	0,0		4,9
1300 - 1500 m	14,8	0,0	0,0		11,1		0,0		12,2
1500 - 1800 m			20,5						20,5
Total	11,1	18,3	5,5	0,0	3,1	0,0	0,0	0,0	8,5

Table 12 Blue ling, CPUE (kg / hour trawling).**Tabell 12** Fangst per enhet innsats (kg / tråltid) fordelt på område og dyp i trålfisket etter blålange.

Depth	1a	1b	2a	2b	3a	3b	4d	4e	Total
200 - 500 m								0,0	0,0
500 -1000 m	0,0		0,0	0,0	100,0			0,0	15,8
1000 - 1300 m	7,1	5,5	6,5		10,4	6,2	7,5		6,9
1300 - 1500 m	3,2	0,0	0,0		0,0		0,0		2,5
1500 - 1800 m			0,0						0,0
Total	4,3	5,2	2,7	0,0	18,6	5,5	4,6	0,0	5,2

Table 13 Round-nose grenadier, CPUE (kg / hour trawling).**Tabell 13** Fangst per enhet innsats (kg / tråltid) fordelt på område og dyp i trålfisket etter skolest.

Depth	1a	1b	2a	2b	3a	3b	4d	4e	Total
200 - 500 m						0,0		0,0	0,0
500 -1000 m	0,0		20,0	33,3	50,0			0,0	19,8
1000 - 1300 m	194,9	181,8	11,8		46,6	153,8	45,1		134,2
1300 - 1500 m	215,2	0,0	26,5		33,3		94,1		177,8
1500 - 1800 m			34,1						34,1
Total	201,1	172,3	21,4	33,3	43,3	138,5	64,2	0,0	141,8

Table 14 Length (cm) and weight (kg) for different species.**Tabell 14** Gjennomsnittslengde og vekt samt maks og minimums verdier for ulike arter registrert under prøvetaking.

Species	Mean L	Max L	Min L	Mean W	Max W	Min W
<i>A. rostrata</i>	58.8	80	48	-	-	-
<i>R. hippoglossus</i>	84.7	103	57	7.27	13.97	1.74
<i>M. dipterygia</i>	94.5	113	82	-	-	-
<i>Hydrolagus spp.</i>	113.5	124	104	-	-	-
<i>C. squamosus</i>	104.8	138	70	7.09	14.10	1.86
<i>C. coelolepis</i>	101.9	122	72	9.25	17.70	2.44
<i>M. berglax</i>	28.6	42	14	-	-	-
<i>C. fabricii</i>	54.5	94	25	-	-	-
<i>L. Schmidtii</i>	85.9	123	50	4.55	7.22	1.11
<i>E. princeps</i>	53.9	88	22	-	-	-

Table 15 Length distributions.

Tabell 15 Lengdefordeling av ulike arter samlet og fordelt på kjønn.

Length (cm)	M. Dypetrigya			Hydrolagus spp.			C. Squamosus			C. Crepidater			C. Coelolepis			R. berglax			C. Fabricii		E. Princeps		R. Hippoglossus. Area 4b&c			R. Hippoglossus. Area 1a&b		R. Hippoglossus. All areas			
	♀	♂	Tot	♀	♂	Tot	♀	♂	Tot	♀	♂	Tot	♀	♂	Tot	♀	♂	Tot	♀	♂	Tot	♀	♂	Tot	♀	♂	Tot	♀	♂	Tot	
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Tabell 15 Continued.

Length (cm)	M. Dyrterigya			Hydrolagus spp.			C. Squamosus			C. Crepidater			C. Coelolepis			R. berglax			C. Fabricii		E. Princeps		R. Hippoglossus. Area 4b&c			R. Hippoglossus. Area 1a&b		R. Hippoglossus. All areas
	♀	♂	Tot	Tot	♀	♂	Tot	Tot	♀	♂	Tot	Tot	♀	♂	Tot	♀	♂	Tot	Tot	Tot	♀	♂	Tot	Tot	Tot	Tot	Tot	
76																			9	1			1	5	1	6		
77											1	2							13	1			5	1	10	1	10	
78											1	2							18				4	1	18	4	22	
79											1	1							11				1		14	3	17	
80											2	2							8				3		20	5	25	
81											1	2							10				4		28	7	35	
82			1	1				1			2	6							10				5		39	11	50	
83											1	1							9				8		29	6	35	
84											2	7	1						13				4		39	7	46	
85			1	1							2	5	2						5				12		47	3	50	
86	1		1								3	6	1						4				11		37	5	42	
87	1		1								1	3							2				7		27	9	36	
88											2	6	2						3				11		37	7	44	
89											1	3											9		29	10	39	
90								1			3	5	1						1				9		39	3	42	
91											2	2											12		33	3	36	
92											2	6	2										1		17	1	18	
93			2	2							3	6		2									5		16	2	18	
94											3	5							1				6		23	5	28	
95							1				2	3											4		8	3	11	
96											1	2													12	1	13	
97											2	4											2		7	2	9	
98	1		1								3	4											1		4		4	
99	1		1			1	1				3	8													2	1	3	
100			1								4	6																
101						1	1				3	7														1		1
102							1				5	7											1		1		1	1
103	1		1								1	5															1	1
104				2							5	6																
105				2							13	20																
106				1							8	12																
107											10	13																
108				1							4	9																
109				1			1				12	18																
110				1							11	20																
111				2							14	18																
112				5			1				11	14																
113	1		1								10	10																
114				2							3	6																
115				5							3	4																
116				1							2	6																
117				9							1	1																
118				2																								
119							1																					
120											1	2																
121																												
122											1	1																
123				1																								
124				1																								
125					1		1																					
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127																												
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135																												
136																												
137																												
138						1	1																					
Total	8	2	11	37	4	1	12	1	168	9	279	25	25	181	652	221	130	16	576	129	705							

Table 16 Catch composition (kg round weight) from Norwegian feasibility fishery on Hatton Bank 2001, all areas combined, in depths between 1200 and 1600 meters.

Tabell 16 For ulike arter viser tabellen samlet fangst, fangstrater, andel av fangst, andel utkast og vekten av utkast under det norske garantifisket ved Hatton Bank på dyp mellom 1200 og 1600m.

Species	Kg	Kg/1000 hooks	% of catch	% discarded	Kg discarded
Centrosyllium fabricii	9341	112,71	30,94	100	9341
Hydrolagus affinis	5222	63,01	17,30	0	0
Reinhardtius hippoglossus	4413	53,24	14,62	0	0
Centrosymnus coelolepis	4264	51,45	14,12	0	0
Etmopterus princeps	3788	45,71	12,55	100	3788
Macrourus berglax	1836	22,15	6,08	0	0
Antimora rostrata	475	5,73	1,57	100	475
Skates	372	4,49	1,23	10	37
Centrophorus squamosus	99	1,20	0,33	0	0
Psuedotriakis microdon	85	1,03	0,28	100	85
Lepidion Smithi	59	0,71	0,20	100	59
Trachyrhynchus trachyrhynchus	56	0,68	0,19	100	56
Lepidion eques	41	0,50	0,14	100	41
Coelorhynchus occa	31	0,37	0,10	100	31
Centrosymnus crepidater	28	0,33	0,09	100	28
Molva dipterygia	22	0,26	0,07	0	0
Galeus murinus	19	0,22	0,06	100	19
Synaphobranchus kaupi	13	0,16	0,04	100	13
Rinochimaera atlanticus	12	0,14	0,04	100	12
Chimaera monstrosa	8	0,10	0,03	0	0
Cottonculus thomsonii	6	0,08	0,02	100	6
Onogadus argentatus	1	0,01	0,002	100	1
	30191	364,28	100,00		13992

Table 17 Catch composition (kg round weight) from Norwegian feasibility fishery on Hatton Bank 2001, area 1a, in depths between 1200 and 1600 meters.

Tabell 17 For ulike arter viser tabellen for område 1 a fangst, fangstrater, andel av fangst, andel utkast og vekten av utkast under det norske garantifisket ved Hatton Bank på dyp mellom 1200 og 1600m.

Species	Kg	Kg/1000 hooks	% of catch	% discarded	Kg discarded
Centrosyllium fabricii	7786	136,30	32,14	100	7786
Hydrolagus affinis	4733	82,86	19,54	0	0
Reinhardtius hippoglossus	3562	62,37	14,71	0	0
Etmopterus princeps	3126	54,73	12,91	100	3126
Centrosymnus coelolepis	2831	49,55	11,69	0	0
Macrourus berglax	1504	26,33	6,21	0	0
Antimora rostrata	243	4,25	1,00	100	243
Skates	132	2,31	0,54	10	13
Centrophorus squamosus	57	0,99	0,23	0	0
Trachyrhynchus trachyrhynchus	56	0,99	0,23	100	56
Lepidion Smithi	55	0,96	0,23	100	55
Lepidion eques	41	0,72	0,17	100	41
Centrosymnus crepidater	25	0,43	0,10	100	25
Coelorhynchus occa	16	0,28	0,07	100	16
Molva dipterygia	14	0,24	0,06	0	0
Galeus murinus	14	0,24	0,06	100	14
Rinochimaera atlanticus	12	0,21	0,05	100	12
Chimaera monstrosa	8	0,14	0,03	0	0
Synaphobranchus kaupi	6	0,11	0,03	100	6
Cottonculus thomsonii	3	0,06	0,01	100	3
Onogadus argentatus	1	0,01	0,002	100	1
Psuedotriakis microdon	0,00	0,00	0,000	100	0
	24223	424,08	100,00		11396

Table 18 Catch composition (kg round weight) from Norwegian feasibility fishery on Hatton Bank 2001, area 2a, in depths between 1200 and 1600 meters.

Tabell 18 For ulike arter viser tabellen for område 2 a fangst, fangstrater, andel av fangst, andel utkast og vekten av utkast under det norske garantifisket ved Hatton Bank på dyp mellom 1200 og 1600m.

Species	Kg	Kg/1000 hooks	% of catch	% discarded	Kg discarded
Centrosyllium fabricii	1556	60,39	26,07	100	1556
Centroscyrnus coelolepis	1434	55,66	24,02	0	0
Reinhardtius hippoglossus	851	33,02	14,25	0	0
Etmopterus princeps	662	25,69	11,09	100	662
Hydrolagus affinis	490	19,01	8,20	0	0
Macrourus berglax	332	12,87	5,56	0	0
Skate	240	9,32	4,02	10	24
Antimora rostrata	233	9,03	3,90	100	233
Psuedotriakis microdon	85	3,30	1,42	100	85
Centrophorus squamosus	43	1,65	0,71	0	0
Coelorhynchus occa	14	0,56	0,24	100	14
Molva dipterygia	8	0,32	0,14	0	0
Synaphobranchus kaupi	7	0,26	0,11	100	7
Galeus murinus	5	0,20	0,09	100	5
Lepidion Smithi	5	0,18	0,08	100	5
Cottonculus thomsonii	3	0,12	0,05	100	3
Centroscyrnus crepidater	3	0,11	0,05	100	3
Total	5968	231,68	100,00		2596

Table 19. Estimated discards from Norwegian longline fishery on Hatton Bank 2001, in depths between 1200 and 1600 meters.

Tabell 19 Estimert utkast fra norsk linefiske ved Hatton bank på dyp fra 1200-1600 meter.

Species	Kg/1000 hooks	Tons
Centrosyllium fabricii	112,71	286
Etmopterus princeps	45,71	116
Antimora rostrata	5,73	15
Psuedotriakis microdon	1,03	2,6
Lepidion Smithi	0,71	1,8
Trachyrhynchus trachyrhynchus	0,68	1,7
Lepidion eques	0,50	1,3
Coelorhynchus occa	0,37	0,9
Centroscyrnus crepidater	0,33	0,8
Galeus murinus	0,22	0,6
Synaphobranchus kaupi	0,16	0,4
Rinochimaera atlanticus	0,14	0,4
Cottonculus thomsonii	0,08	0,2
Skates	4,49	1,0
Onogadus argentatus	0,01	0,02
Total	172,86	429