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German Research Report for 2004

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Sub-area 0

B. Special Studies

1. Environment

A new oceanographic section line between Greenland and Canada was formed during the autumn 2004 cruise of FRV “*Walther Herwig III*” to measure the flow of water masses across the Davis Strait sill and the West Greenland shelf which is a 330 km wide gap between West Greenland and Baffin Island/Canada. Leaving the port of Holsteinsborg/Sisimiut on 31 October, FRV “*Walther Herwig III*” followed five NAFO Standard Stations of the Holsteinsborg Section (N1, ... , N5) and, after reaching the 200 nm EEZ of Canada, continued with five stations following historic Canadian RV “*Hudson*” positions along 66°30’N (5, ... , 1). The section was completed on 1 November in the vicinity of Cape Dyer/Baffin Island, Canada. All profiles were obtained with a CTD (SeaBird 911+). Scientific results on this section are given in Stein (2005a). The manuscript of this paper is submitted for publication in the *Journal of Northwest Atlantic Fisheries Science*.

Sub-area 1

A. Status of the Fishery

In 2004, demersal fishing was conducted with low effort in Div. 1D inside the Greenland EEZ from August until October. The fishery was directed towards Greenland halibut (*Reinhardtius hippoglossoides*). By end of the year, reported landings amounted to 534 tons of Greenland halibut. There was negligible by-catch of roundnose grenadiers, wolffish and skates reported. Table 1 lists a breakdown of the effort, landings, and non-standardised Greenland halibut CPUE by month. The annual trend is shown in Fig. 1.

While the demersal fishery for Greenland halibut is a normal activity, the pelagic fishery for pelagic redfish (*Sebastes mentella*) occurred for the first time off West Greenland in 1999 and increased substantially in 2000 due to a change in distribution patterns of the stock in westerly direction as derived from an international hydro-acoustic survey conducted in June/July 2001 by Iceland, Russia and Germany (ICES CM, 2002). The German fisheries in Div. 1F as well as historic survey results are described in detail by (Rätz and Stransky, 2001). In 2004, the fishery was conducted in the NAFO Regulatory Area and Greenland EEZ in Div. 1F mainly during the 3rd quarter at depths shallower than 500 m and targeted almost exclusively mature redfish with almost no discard and no by-catch of other species. In comparison with 2003 when total landings of 2 536 tons were reported, both landings and effort in 2004 decreased substantially by more than 50% and amounted to 1 020 tons and 1 049 trawling hours, respectively. Table 2 lists a breakdown of the effort, landings, and non-standardised pelagic redfish CPUE by area, year and quarter.

B. Special Studies

1. Environment

During the autumn cruise of FRV “*Walther Herwig III*” to Greenland waters, CTD profiles were obtained at each fishing position of the surveyed area (123 stations). Observations on Standard Oceanographic Stations (Stein, 1988) were done at the Cape Desolation Section (3 stations) and the Fyllas Bank Section (5 stations). Scientific results on these oceanographic measurements are given in Stein (2005b).

2. Biological Studies

Since 1982, annual groundfish surveys were conducted. During the fourth quarter, stratified random surveys covered shelf areas and the continental slope off West Greenland (Div. 1B-1F) outside the 3-mile limit to the 400 m isobath. In October-November 2004, 65 valid hauls were carried out and the standard survey area was completely covered. The total survey catch amounted to 4 911 kg. 18 875 specimens were classified to 49 taxonomic units. Based on this survey information, assessments of the stock status for demersal redfish (*Sebastes marinus*, *S. mentella*), American plaice (*Hippoglossoides platessoides*), Atlantic wolffish (*Anarhichas lupus*), and thorny skate (*Raja radiata*) are documented (Rätz and Stransky, 2005).

During the period 27 May until 22 June 2003, the German research vessel “*Walther Herwig III*” participated in the international hydro-acoustic pelagic trawl survey together with Icelandic and Russian vessels. The survey is designed to cover the entire distribution area of pelagic redfish in NAFO and ICES Divisions down to 1 000 m depth. The redfish abundance in NAFO Div. 1F was found very low in June 2003. However, the survey results are found inconsistent with earlier stock size estimates and recommended not to be used for assessment purposes (ICES CM, 2003). This survey will be repeated in June/July 2005 (ICES CM, 2005).

For 1996-2004, estimates of landings, effort and catch rates (CPUE) for Greenland halibut and pelagic redfish by year and month or quarter are presented (Tables 1-3). The series of average Greenland halibut CPUEs is shown in Fig. 1 and does not reveal a significant trend. The catch rate estimates for pelagic redfish can hardly be interpreted as stock size indices given the recent redistribution of the fishery and its seasonal limitation. Catch rate analyses including the entire stock distribution in the NAFO and ICES Divisions are undertaken by the ICES North-western Working Group (ICES CM, 2005) and recently reviewed by ACFM. There are no biological sampling data available for commercial Greenland halibut catches but size distribution of pelagic redfish catches from the commercial fishery in 2004 is given in Table 4. The computations in 2000 are based on 16 stations and 9 336 length measurements, in 2001 on 5 stations and 4 994 length measurements, in 2002 on 2 stations and 1 090 length measurements, and in 2004 on 24 stations and 18 239 length measurements, respectively. Measurements represent total body length and their precision is in cm below. The pelagic redfish size compositions in the German catches are illustrated in Fig. 2. The size compositions of the catches in 2000-2004 are almost identical with mean fish sizes ranging about 35 cm. There is indication of recruitment of pelagic redfish below 30 cm length in all three years.

Sub-area 2

A. Status of the Fishery

In 2003, German trawlers conducted a pelagic fishery for pelagic redfish (*Sebastes mentella*) for the first time in the NAFO Regulatory Area of Div. 2J. The fishery was conducted in Div. 2J during the 3rd quarter only at depths shallower than 500 m and targeted almost exclusively mature redfish with almost no discard and no by-catch of other species. In 2003, landings and effort amounted to 467 t and 606 trawling hours, respectively. This seasonal fishery was also conducted during the 3rd quarter in 2004 yielding 28 t from 35 trawling hours only. Table 3 lists a breakdown of the effort, landings, and non-standardised pelagic redfish CPUE by year and quarter.

B. Special Studies

1. Environment

No research in relation to environment was carried out by Germany in NAFO Sub-area 2.

2. Biological studies

During the period 27 May until 22 June 2003, the German research vessel “*Walther Herwig III*” participated in the international hydro-acoustic together with Icelandic and Russian vessels. The survey is designed to cover the entire distribution are of pelagic redfish in NAFO and ICES Divisions down to 1 000 m depth. The redfish abundance in NAFO Div. 2H and 2J (NRA only) was found very low in June 2003. However, the survey results are found inconsistent with earlier stock size estimates and recommended not to be used for assessment purposes (ICES CM, 2003). This survey will be repeated in June/July 2005 (ICES CM, 2005).

There are no biological sampling data available from the commercial fishery in 2003.

Sub-area 3

A. Status of the Fishery

In 2003, German fishing vessels did not fish in Sub-area 3.

B. Special Studies

1. Environment

No research in relation to environment was carried out by Germany in NAFO Sub-area 3.

2. Biological studies

No biological samplings or studies were performed by Germany in NAFO Sub-area 3.

References

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 Stein, M. 2005a. Atlantic Subpolar Gyre Warming – Impacts on Greenland Offshore Waters?. NAFO SCR Doc.05/01, 14p.
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TABLE 1. German effort (hours fished), landings (tons), unstandardized CPUE (kg/h) and accompanied standard deviations for Greenland halibut in Sub-division 1D by month, 1996-2004.

Year	Month	Effort 1D	Landing 1D	CPUE 1D	St.Dev.
1996	September	74	19	265	97
1996	October	490	136	270	104
1996	November	562	259	457	147
1996	December	90	37	415	150
1996		1217	452	365	158
1997	November	758	334	456	262
1997	December	262	112	423	138
1997		1020	446	448	237
1998	October	34	16	482	225
1998	November	506	205	430	191
1998	December	267	129	494	154
1998		806	350	446	186
1999	September	208	89	428	80
1999	October	439	163	371	71
1999	November	462	187	400	83
1999		1108	439	393	80
2000	September	318	161	504	119
2000	October	471	194	426	120
2000	November	209	89	426	62
2000		998	444	447	118
2001	September	296	133	435	256
2001	October	873	277	329	164
2001	November	342	127	376	185
2001		1511	537	364	196
2002	September	119	58	482	187
2002	October	591	268	459	125
2002	November	463	191	416	111
2002	December	47	20	396	73
2002		1220	537	440	125
2003	October	449	204	460	121
2003	November	517	291	570	177
2003	December	88	47	611	267
2003		1054	542	527	174
2004	August	124	53	411	133
2004	September	659	308	470	145
2004	October	427	173	415	172
2004		1210	534	443	155

TABLE 2. German landings (tons), effort (hours fished), unstandardized CPUE (kg/h) and accompanied standard deviations for pelagic redfish (*Sebastes mentella*) in Sub-division 1F in the NAFO Regulatory Area (NRA) and the Greenland Exclusive Economic Zone (EEZ) by quarter, 1999-2004.

Year	Quarter	Landings (t)	Effort (h)	CPUE (kg/h)	Std.Dev. (kg/h)	Landings (t)	Effort (h)	CPUE (kg/h)	Std.Dev. (kg/h)
		NRA	NRA	NRA	NRA	EEZ	EEZ	EEZ	EEZ
1999	1	0	0			0	0		
1999	2	0	0			0	0		
1999	3	0	0			154	231	663	226
1999	4	0	0			0	0		
1999		0	0			154	231	663	226
2000	1	0	0			0	0		
2000	2	0	0			0	0		
2000	3	2558	2219	1231	571	1434	1325	1360	1156
2000	4	438	506	909	374	46	69	716	214
2000		2996	2725	1171	554	1480	1394	1324	1134
2001	1	0	0			0	0		
2001	2	0	0			0	0		
2001	3	26	36	752	147	791	654	1540	1744
2001	4	0	0			0	0		
2001		26	36	752	147	791	654	1540	1744
2002	1	0	0			0	0		
2002	2	0	0			0	0		
2002	3	2167	2122	1088	678	155	218	864	977
2002	4	0	0			0	0		
2002		2167	2122	1088	678	155	218	864	977
2003	1	0	0			0	0		
2003	2	0	0			0	0		
2003	3	1669	1389	1375	1019	622	694	896	368
2003	4	0	0			245	278	918	512
2003		1669	1389	1375	1019	867	972	902	408
2004	1	0	0			0	0		
2004	2	0	0			0	0		
2004	3	777	625	1623	1676	243	424	633	320
2004	4	0	0			0	0		
2004		777	625	1623	1676	243	424	633	320

TABLE 3. German landings (tons), effort (hours fished), unstandardized CPUE (kg/h) and accompanied standard deviations for pelagic redfish (*Sebastes mentella*) in Sub-division 2J in the NAFO Regulatory Area (NRA) by quarter, 2004.

Year	Quarter	Landings (t)	Effort (h)	CPUE (kg/h)	Std.Dev. (kg/h)	Landings (t)	Effort (h)	CPUE (kg/h)	Std.Dev. (kg/h)
		NRA	NRA	NRA	NRA	EEZ	EEZ	EEZ	EEZ
2003	1	0	0			0	0		
2003	2	0	0			0	0		
2003	3	467	606	785	208	0	0		
2003	4	0	0			0	0		
2003		467	606	785	208	0	0		
2004	1	0	0			0	0		
2004	2	0	0			0	0		
2004	3	28	35	900	544	0	0		
2004	4	0	0			0	0		
2004		28	35	900	544	0	0		

TABLE 4. Size composition of the German catch of pelagic redfish in Div. 1 F in 2000-2004 by quarter, shallower than 500 m.

Length (cm)	2000 3rd	2000 4th	2000	2001 3rd	2001	2002 3rd	2002	2004 3rd	2004
	Quarter	Quarter		Quarter		Quarter			
	NAFO 3rd Q	NAFO 4th Q	Total	NAFO 3rd Q	Total	NAFO 3rd Q	Total	NAFO 3rd Q	Total
	<500 m	<500 m		<500 m		<500 m		<500 m	
20.5	0	0	0	0	0	0	0	0	0
21.5	3464	419	3883	0	0	0	0	0	0
22.5	6928	838	7766	830	830	0	0	0	0
23.5	28576	3457	32033	1433	1433	0	0	0	0
24.5	39833	4820	44653	7950	7950	0	0	6	6
25.5	44163	5343	49506	10577	10577	62	62	12	12
26.5	48493	5867	54360	16095	16095	151	151	41	41
27.5	69275	8382	77657	16283	16283	228	228	95	95
28.5	105645	12782	118427	20607	20607	255	255	265	265
29.5	182714	22107	204821	27759	27759	518	518	420	420
30.5	211290	25564	236854	38757	38757	788	788	573	573
31.5	282298	34156	316454	52967	52967	1078	1078	722	722
32.5	443363	53643	497006	79871	79871	2365	2365	1024	1024
33.5	693621	83923	777544	159013	159013	3373	3373	1466	1466
34.5	1089357	131803	1221160	220408	220408	4784	4784	2181	2181
35.5	1214919	146995	1361914	251605	251605	5657	5657	3050	3050
36.5	1205393	145843	1351236	220628	220628	5491	5491	2756	2756
37.5	1088491	131699	1220190	210579	210579	5611	5611	2342	2342
38.5	685827	82980	768807	143321	143321	3111	3111	1857	1857
39.5	419117	50710	469827	62035	62035	1642	1642	924	924
40.5	142015	17183	159198	25585	25585	525	525	412	412
41.5	55420	6705	62125	3545	3545	166	166	68	68
42.5	19917	2410	22327	415	415	62	62	23	23
43.5	4330	524	4854	0	0	0	0	2	2
44.5	0	0	0	415	415	0	0	0	0
45.5	866	105	971	0	0	0	0	0	0
46.5	866	105	971	0	0	0	0	0	0
47.5	0	0	0	0	0	0	0	0	0
48.5	0	0	0	0	0	0	0	0	0
49.5	0	0	0	0	0	0	0	0	0
50.5	0	0	0	0	0	0	0	0	0
sum	8086181	978363	9064544	1570678	1570678	35867	35867	18239	18239
kg	3992000	483000	4475000	817000	817000	20000	20000	9467	9467
mean	35.3	35.3	35.3	35.2	35.2	35.5	35.5	35.5	35.5

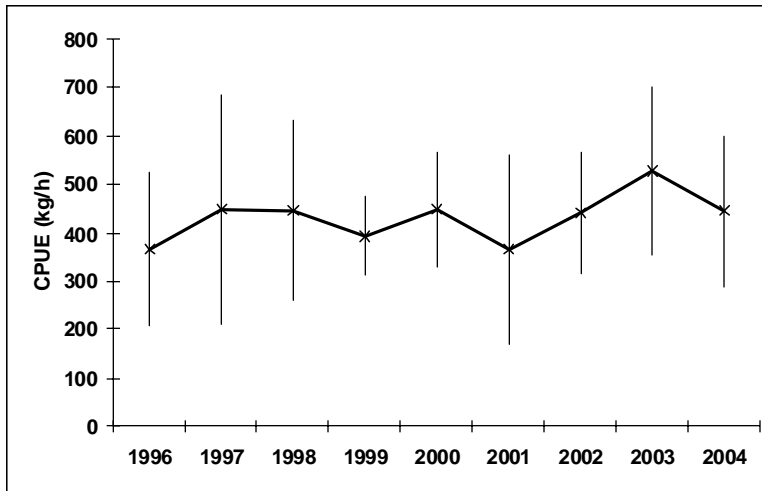


Fig. 1. Greenland halibut in NAFO Div. 1D. Unstandardised CPUE and accompanied standard deviation by year as derived from German commercial landings mainly taken during the 4th quarters, 1996-2004. Respective values are listed in Table 1.

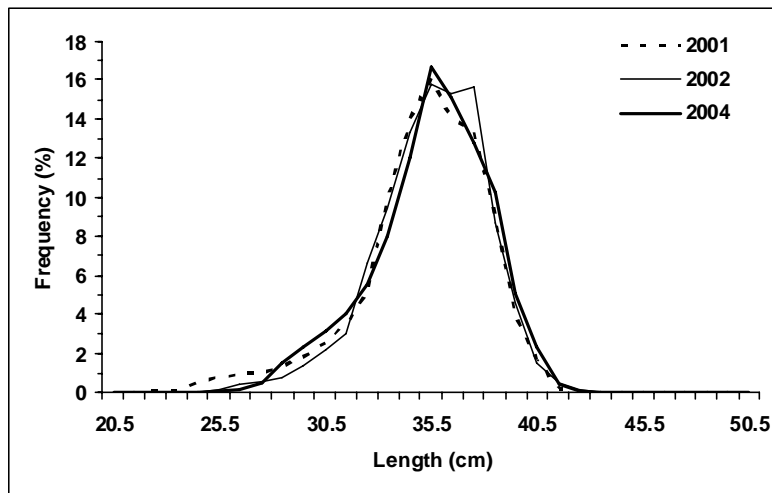


Fig. 2. Size composition of German catches of pelagic redfish in Div. 1 F, 2001-2004. Respective values are listed in Table 4.