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German Research Report for 2009

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Sub-area 1

A. Status of the Fishery

From 2007 to 2008, demersal fishing effort decreased in Division 1D inside the Greenland EEZ from from 2230 hours in '07 to 1891 hours in '08 and 1781 h in '09. The fishery was directed towards Greenland halibut (*Reinhardtius hippoglossoides*). By end of the year 2009, reported landings amounted to 1493 tons of Greenland halibut. The by-catch of roundnose grenadiers was < 1 t in 2008 and 2009 compared to 2.2 t (2006) to about 4 t (2007, 2008). Wolffish and skates were not reported as by-catch (presumably less than 1 ton). Table 1 lists a breakdown of the effort, landings, and non-standardised Greenland halibut CPUE by month and year. The annual trend is shown in Figure 1.

The pelagic fishery from 2000 to 2006 for pelagic redfish (*Sebastes mentella*) appeared as an intermezzo only. It occurred for the first time off Southwest Greenland in 1999, and increased substantially in 2000 due to a change in distribution patterns of the stock in westerly direction as derived from a biennial international hydro-acoustic surveys conducted in June/July 2001-2005 by Iceland, Russia and Germany (e.g. ICES CM, 2005). After 2000, the fishery was conducted in the NAFO Regulatory Area and Greenland EEZ in Div. 1F during the 3rd quarter at depths above 500 m and targeted almost exclusively mature redfish with almost no discard and no by-catch of other species. No fishery was reported since 2007. Table 2 lists a breakdown of the effort, landings, and non-standardised pelagic redfish CPUE by area, year and quarter. However, catch rate estimates for pelagic redfish can hardly be interpreted as stock size indices given the redistribution over the last years 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 and regularly reviewed by ICES ACOM.

In 2008, commercial German cod fisheries commenced again in Div. 1F. The catch in 2008 was 2415 t. In 2009, catch dropped to 370 t. Table 5 lists a breakdown of the effort, landings, and non-standardised CPUE by month and year.

B. Special Studies

1. Environment

During the German groundfish survey off Greenland (October 08 – November 20, 2009), fishery oceanographic measurements were performed at **34** fishing stations off West Greenland by means of CTD/Rosette. Additionally, temperature and salinity at stations of 2 NAFO standard oceanographic sections off West Greenland (Cape Desolation [4], Fyllas Bank [5]) were measured in order to describe long-term trends. Results on oceanographic measurements are given in Stein and Akimova (2010).

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 (Divisions 1B-1F) outside the 3-mile limit to the 400 m isobath. In October-November 2009, **34** valid hauls were carried out while covering about 88 % of the standard survey area. 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 (Nygard et al., 2010).

During the period 14 June until 12 July 2005, the German research vessel "Walther Herwig III" participated in the international hydro-acoustic pelagic trawl survey together with Icelandic and Russian vessels (ICES PGRS REPORT 2009, publ. as ICES CM 2009/RMC:05). The survey is designed to cover the entire distribution of pelagic redfish in NAFO and ICES Divisions down to 1 000 m depth. The survey will be continued in 2011.

The pelagic redfish size composition in the German catch is illustrated in Fig. 2. The size compositions of the catches in 2000-2004 are almost identical with mean fish sizes ranging about 35cm. Opposite to 2005, when there was an indication of a shift to older specimens >40 cm, average size declined in 2006.

Size distribution of catches of Atlantic cod in the catches is presented in Figure 3.

Sub-area 2

A. **Status of the Fishery**

2 J

No fisheries in 2007- 2009. 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 above 500 m and targeted almost exclusively mature redfish with almost no discard and no by-catch of other species. No fishery was carried out since 2006. Table 3 lists a breakdown of the effort, landings, and non-standardised pelagic redfish CPUE by year and quarter.

2 H

No fisheries in 2007 - 2009. In 2006, one catch of 4 t redfish was recorded for 2 H.

B. **Special Studies**

1. **Environment**

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

2. **Biological studies**

2009 hydro-acoustic survey for pelagic redfish: see SA 1

Sub-area 3

A. **Status of the Fishery**

In 2007-2009, 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:

ICES CM 2009. Report of the Planning Groupon Redfish Surveys (PGRS). ICES CM 2009 RMC:05, 56 pp.

Nygaard, Rasmus; Fock, Heino Ove; Stransky, Christoph (2010) Assessment of demersal redfish in NAFO subarea 1. NAFO SCR Doc. 10/

Stein, M. and A. Akimova 2010. Climatic conditions around Greenland 2009. Serial No. N5620 NAFO SCR Doc. 10/05: 1-23.

Table 1. German effort (hours fished), landings (tons), unstandardized CPUE (kg/h) and accompanied standard deviations for Greenland halibut (*R. hippoglossoides*) in Sub-div. 1D by month and by year, 1996-2008. CPUE statistics calculated for catches > 100 kg only.

Year	Month	Effort 1D	Landing 1D	CPUE 1D	St.Dev.	Effort 1C	Landing 1C	CPUE 1C	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	total	1054	542	527	174				
2004	August	124	53	411	133				
2004	September	659	308	470	145				
2004	October	427	173	415	172				
2004	total	1210	534	443	155				
2005	September	356	194	561	169				
2005	October	610	307	522	179				
2005	November	98	48	485	149				
2005	total	1064	549	531	172				
2006	September	129	93	724	224				
2006	October	599	431	741	198				
2006	November	32	20	601	91				
2006	total	760	544	732	197				
2007	July	472	234	496	116				
2007	August	561	402	709	148				
2007	September	547	453	853	296				
2007	October	509	348	676	138				
2007	November	141	99	702	123				
2007	total	2230	1536	691	173				
2008	July	596	410	694.79	124.6				
2008	August	441	449	1032.13	222.19				
2008	September	559	444	795.41	164.14				
2008	October	295	249	846.83	349.2				
2008	November								
2008	total	1891	1551	830	194				
2009	June	245.83	161	650.78	241.06				
2009	July	15.5	3	209.6	0				
2009	August	380.75	422	1141.98	413.76				
2009	September	324.58	218	675.69	237.84	61.25	45	741.03	8
2009	October	256.75	188	732.99	343.1				
2009	November	483.58	418	902.65	343.41				
2009	December	74.92	83	1610.76	1541.7				
2009	total	1781.91	1493	875.2	334.6	61.25	45	741.03	8

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, 1999-2008.

Year	Quarter	Landings (t) NRA	Effort (h) NRA	CPUE (kg/h) NRA	Std.Dev. (kg/h) NRA	Landings (t) EEZ	Effort (h) EEZ	CPUE (kg/h) EEZ	Std.Dev. (kg/h) 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
2005	1								
2005	2								
2005	3	430	915	485	338	364	620	594	338
2005	4								
2005	annual	430	915	485	338	364	620	594	338
2006	1								
2006	2								
2006	3	154	326	486	231	836	894	937	451
2006	4								
2006	annual	154	326	486	231	836	894	937	451
2007	annual	0		-		0		-	
2008	annual	0		-		0		-	
2009	annual	0				0			

Table 3. **(a)** 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, 2003-2008.
(b) German landings (tons), effort (hours fished), unstandardized CPUE (kg/h) and accompanied standard deviations for pelagic redfish (*Sebastes mentella*) in Sub-division 2H.

Table 3 a
NAFO SA 2J

Year	Quarter	Landings (t) NRA	Effort (h) NRA	CPUE (kg/h) NRA	Std.Dev. (kg/h) NRA	Landings (t) EEZ	Effort (h) EEZ	CPUE (kg/h) EEZ	Std.Dev. (kg/h) 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		
2005									
2005									
2005	3	232	393	662	513				
2005									
2005	annual	232	393	662	513	0	0	0	-
2006	annual	0	0	0	-	0	0	0	-
2007	annual	0	0	0	-	0	0	0	-
2008	annual	0	0	0	-	0	0	0	-
2009	annual	0	0			0	0		

Table 3 b
NAFO SA 2H

Year	Quarter	Landings (t) NRA	Effort (h) NRA	CPUE (kg/h) NRA	Std.Dev. (kg/h) NRA	Landings (t) EEZ	Effort (h) EEZ	CPUE (kg/h) EEZ	Std.Dev. (kg/h) EEZ
2006	1								
2006	2								
2006	3	4	17	224	-				
2006	4								
2006	annual	4	17	224	-	0	0		-
2007	annual	0	0		-	0	0		-
2008	annual	0	0			0	0		
2009	annual	0	0			0	0		

Table 4 Size composition of the German catch of pelagic redfish in Div. 1 F in 2000-2006 by quarter, above 500 m. Subsamples in 2002 – 2006 not raised to total catch. No catches in 2007, 2008 and 2009.

Length (cm)	2000 3rd Quarter NAFO 3rd Q <500 m	2000 4th Quarter NAFO 4th Q <500 m	2000 Total	2001 3rd Quarter NAFO 3rd Q <500 m	2002 3rd Quarter NAFO 3rd Q <500 m	2004 3rd Quarter NAFO 3rd Q <500 m	2006 3rd Quarter NAFO 3rd Q <500 m
20.5	0	0	0	0	0	0	249
21.5	3464	419	3883	0	0	0	421
22.5	6928	838	7766	830	0	0	801
23.5	28576	3457	32033	1433	0	0	1198
24.5	39833	4820	44653	7950	0	6	1347
25.5	44163	5343	49506	10577	62	12	1407
26.5	48493	5867	54360	16095	151	41	1813
27.5	69275	8382	77657	16283	228	95	7031
28.5	105645	12782	118427	20607	255	265	16693
29.5	182714	22107	204821	27759	518	420	30376
30.5	211290	25564	236854	38757	788	573	52033
31.5	282298	34156	316454	52967	1078	722	70355
32.5	443363	53643	497006	79871	2365	1024	105137
33.5	693621	83923	777544	159013	3373	1466	120941
34.5	1089357	131803	1221160	220408	4784	2181	128909
35.5	1214919	146995	1361914	251605	5657	3050	150461
36.5	1205393	145843	1351236	220628	5491	2756	128480
37.5	1088491	131699	1220190	210579	5611	2342	96871
38.5	685827	82980	768807	143321	3111	1857	56993
39.5	419117	50710	469827	62035	1642	924	29798
40.5	142015	17183	159198	25585	525	412	15146
41.5	55420	6705	62125	3545	166	68	4371
42.5	19917	2410	22327	415	62	23	484
43.5	4330	524	4854	0	0	2	85
44.5	0	0	0	415	0	0	32
45.5	866	105	971	0	0	0	33
46.5	866	105	971	0	0	0	0
47.5	0	0	0	0	0	0	0
48.5	0	0	0	0	0	0	0
49.5	0	0	0	0	0	0	0
50.5	0	0	0	0	0	0	0
sum	8086181	978363	9064544	1570678	35867	18239	1021465
kg	3992000	483000	4475000	817000	20000	9467	477000
mean l (cm)	35.3	35.3	35.3	35.2	35.5	35.5	34.6
mean w (kg)	0.49	0.49	0.49	0.52	0.56	0.52	0.47

Table 5 German effort (hours fished), landings (tons), unstandardized CPUE (kg/h) and accompanied standard deviations for Atlantic cod (*Gadus morhua*) in Sub-div. 1F by month and by year, 2008 and 2009. CPUE statistics calculated for catches > 100 kg only.

Year	Month	Effort 1F	Landing 1F	CPUE 1F	St.Dev.
2008					
2008	8	962	1511	1604	952
2008	9	894	905	992	560
2008	total	1856	2415	1309	763
2009	8	126	253	2122	1229
2009	9	62	70	995	796
2009	10	102	47	514	360
2009	total	290	370	1316	830

Table 6 Size composition of the the sampled portion of the German catch of Atlantic cod in Div. 1 F in 2008 by quarter. No catches in 2007. Some 500 t sampled from a total catch of 2415 t.

Length (cm)	2008 3rd Quarter
24.5	8
26.5	4
29.5	19
30.5	19
31.5	137
32.5	208
33.5	336
34.5	592
35.5	871
36.5	841
37.5	1092
38.5	1629
39.5	1753
40.5	3007
41.5	3935
42.5	4614
43.5	6416
44.5	7662
45.5	10286
46.5	12576
47.5	15663
48.5	18501
49.5	18379
50.5	23514
51.5	22223
52.5	25618
53.5	28838
54.5	28126
55.5	28212
56.5	25295
57.5	28658
58.5	26621
59.5	21837
60.5	21009
61.5	16449
62.5	14135
63.5	12518
64.5	10291
65.5	9105
66.5	6837
67.5	7564
68.5	7602
69.5	5390
70.5	4847
71.5	3877
72.5	2881
73.5	2628
74.5	2341
75.5	1706
76.5	1228
77.5	754
78.5	734
79.5	487
80.5	491
81.5	369
82.5	229
83.5	258
84.5	335
85.5	321
86.5	164
87.5	272
88.5	41
89.5	107
90.5	156
91.5	139
92.5	46
93.5	146
94.5	93
95.5	36
96.5	9
97.5	66
98.5	31
99.5	36
100.5	110
102.5	67
103.5	5
104.5	62
105.5	57
106.5	17
107.5	9
sum	503543
kg	89538

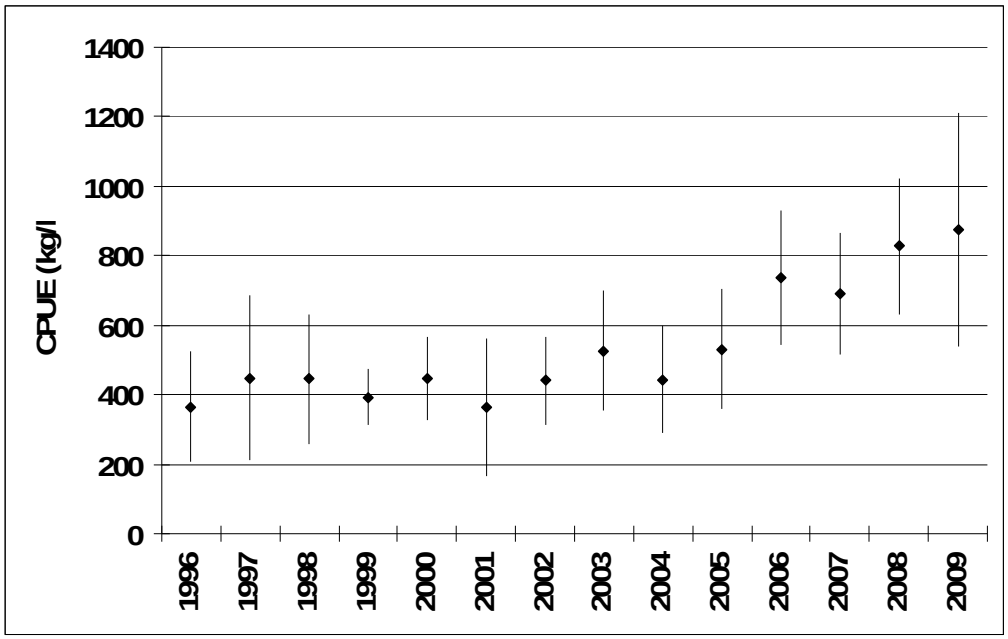

Fig. 1. Greenland halibut in NAFO Div. 1D. Unstandardised CPUE and accompanied standard deviation by year as derived from German commercial landings mainly taken during the 4th quarters, 1996-2007. Respective values are listed in Table 1.

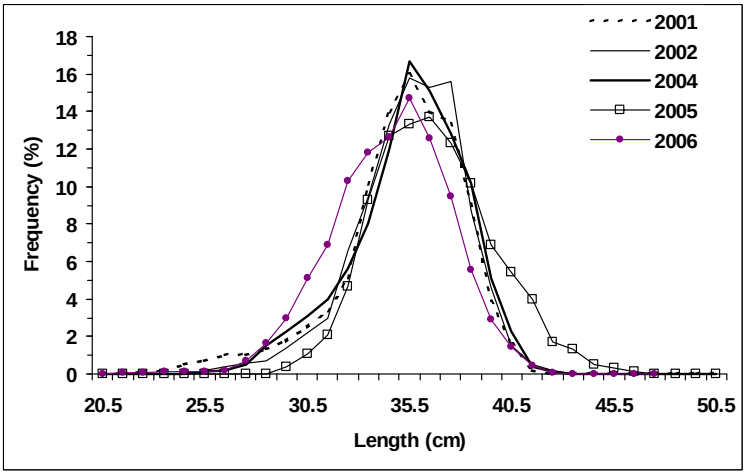

Fig. 2. Size composition of German catches of pelagic redfish in Div. 1 F, 2001-2006. Respective values are listed in Table 4. No catch in 2007 and 2008.

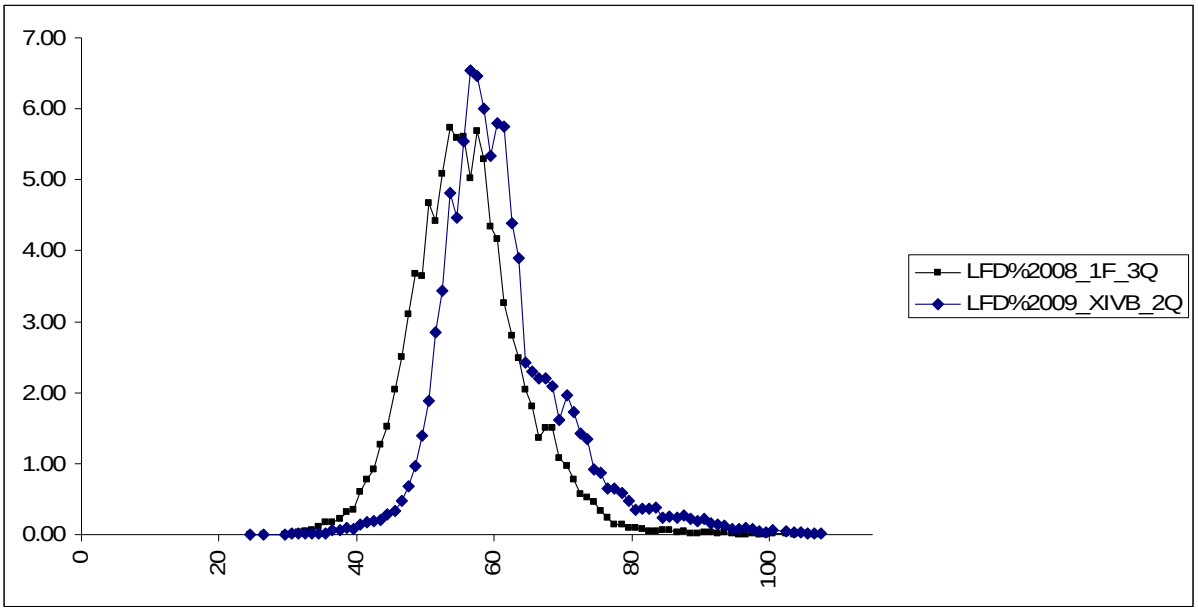

Fig. 3. Size composition of German catches of Atlantic cod in Div. 1 F, 2008, and XIVb in 2009. Respective values are listed in Table 6. No catch in 2007.