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Polish Research Report, 1979

by

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Introduction

The overall catch by the Polish fishing fleet in NAFO Subareas 2 to 6 in 1979 was 20,621 tons (Table 1), exceeding the 1978 catch by 2,495 tons. About 6.7% (1,385 tons) of that catch was taken under cooperative arrangement with Canada. A further rapid reduction occurred in the overall finfish catch from 16,182 tons in 1978 to 9,967 tons in 1979, mainly due to the reduction in the Polish allocation for capelin (from 14,500 to 1,820 tons) and Greenland halibut (from 5,290 tons to 1,850 tons), no quota for redfish (710 tons in 1978), as well as under-utilization of some quotas like cod in Div. 2GH (34.3% taken), cod in Div. 3M (0.4% taken), roundnose grenadier in Subareas 2+3 (4.8% taken), witch flounder in Div. 2J+3KL (53% taken) and squid-*Illex* in Subareas 5+6 (6% taken) (Table 2). The full utilization of the allocations was hampered either by hydrological features of the northern fishing area (ice coverage) or by gear restrictions (*Illex* fishery in Subareas 5+6) or by the low allocations and restrictions on seasonal and area operations which made the fishing operations unprofitable.

The main component of the overall catch was squid-*Illex* (51.7%), followed by cod (27.3%), witch flounder (9.0%) and Greenland halibut (8.8%) (Table 1). The quantities of other species taken as by-catch were negligible. The increase in the squid-*Illex* catch in comparison to that for 1978 was due to an allocation in 1979 of 8,000 tons from the Canadian quota.

Catches in Subarea 2 remained at about the same level as in 1978 at 47,000 tons, but the Subarea 3 catch declined from 11,100 tons in 1978 to only 5,400 tons in 1979. The squid catch in Subarea 4 was 10,600 tons in 1979 compared with only 1,800 tons in 1978. The introduction of jiggers on board of Polish fishing vessels allowed for the catching of squid-*Illex* in the USA fishery zone of 167 tons (6.0% of the total *Illex* catch.

Subarea 2

Status of the Fisheries

The overall catch by Polish vessels in Subarea 2 was 4,697 tons (Table 3) compared with 4,744 tons in 1978. About 54% of the total was taken in Div. 2J, 46% in Div. 2H, and only 2% in Div. 2G. Some increase in the catches of Greenland halibut and cod in Div. 2H, relative to 1978, was noted. In Subarea 2 as a whole, 79% of the total consisted of cod and 16% of Greenland halibut.

Cod. The cod allocation for Poland in 1979 was the same as in 1978. In the winter season, it was not possible to fish in Div. 2G and 2H due to heavy ice conditions, the catches in Div. 2H having been taken in September to December. Only in Div. 2J was it possible to fish for cod during the winter and nearly all of the catch was taken in January-February (Table 4).

In February in Div. 2J, 7,045 cod were measured (mean length 49.2 cm) (Table 5) and 6 samples were collected for detailed biological analysis. The 1973 and 1974 year-classes constituted more than 60% of the commercial cod catches (Table 6).

Greenland halibut. Although the Polish allocation was decreased from 5,290 tons in 1978 to 1,820 tons in 1979, the quantity of Greenland halibut taken in Subarea 2 (738 tons) was nearly the same as in 1978. Most of the catch was taken in Div. 2H in September (69%) (Table 7).

Length measurements consisted of 99 specimens in Div. 2G, where only 68 tons were caught, and 923 specimens in Div. 2H (Table 8). In the case of males, the 1971 year-class prevailed, followed by the 1972 year-class, whereas the opposite was observed in the case of females (Table 9).

Witch flounder. Only 19 tons were taken in Subarea 2 in 1979 compared with 236 tons in 1978 (Table 3). The observed decrease was related in a large extent to the overall decline of witch catches from the Div. 2J+3KL stock. The whole amount was taken in February (Table 11), and there was no biological sampling of the very small by-catches.

Redfish. The total catch in Subarea 2 was 88 tons in 1979 (Table 14). Unlike 1978, Poland had no redfish allocation for 1979 and all amounts were taken as by-catch. No biological samples were collected.

Subarea 3

Status of the Fisheries and Research

The overall catch in Subarea 3 decreased from 11,116 tons in 1978 to 5,356 tons in 1979, of which 25% was taken under cooperative arrangements with Canada (Table 10). As in preceding years, the bulk of the catch (94%) was taken in Div. 3K. Cod constituted 35.7% of the total catch, followed by witch flounder (34.3%) and Greenland halibut (20%).

Cod. The 1979 catch in Subarea 3 was 1,914 tons, nearly twice the amount taken in 1978. Most of the catch originated from Div. 3K (93.7%) (Table 10). The fishing season extended from February to March, during which 92.3% of the total was taken (Table 4).

Length measurements were taken on 13,138 specimens (Table 5) in Div. 3K during February to April, and 2,961 specimens in Div. 3L in March. The mean lengths varied from 49.6 to 53.9 cm. The most abundant year-class observed in Div. 3K in February was 1973 (42.9%) and to a lesser extent in March (34.3%) (Table 6). The 1974 year-class prevailed in Div. 3K in April and in Div. 3L in March.

Witch flounder. The Polish allocation of 3,500 tons for 1979 was not fully taken, due largely to 2 factors : (a) somewhat lower effort directed for that species in 1979 compared to 1978, when the quota was fully utilized, and (b) the catch rates were lower (8-10 tons per day) in 1979 than in 1978 (12-14 tons per day fished). The fishery on this species was mainly in Div. 3K where 90% of the catch was taken in February and March (Table 11).

Length measurements were taken for 119 males and 363 females in Div. 3K, with mean lengths of 44.6 and 48.8 cm respectively (Table 12). In the age compositions, age-groups 7 to 15+ were present with prevailing numbers of 8-10 year old males (67.8%) and 10-11 year old females (37.5%) (Table 13).

Greenland halibut. The reduction in the Polish allocation resulted in a considerable decrease in the catch of this species in Subarea 3 to 1,075 tons in 1979 compared to 4,510 tons in 1978 (Table 10). The directed fishery for this species had to be terminated during the best part of the fishing season (February to April), but resumed in May and June when 70% of the Subarea 3 catch was taken.

No biological samples were collected in this area as no sampling team was available to cover the fishing in the late spring season.

Redfish. There was no directed fishery by Polish vessels in 1979, nearly all of the catch (231 tons) being taken as by-catch in Div. 3K during February to April (Table 14). As in Subarea 2, no biological samples were collected in 1979.

Subarea 4

Status of Fisheries and Research

Following the pattern observed in 1977 and 1978, the only directed fishery in Subarea 4 during 1979 was for squid-*Illex*. The national allocation was the same as for 1978 (2,000 tons), and an additional allocation of 8,500 tons was authorized from the Canadian quota (Table 2). Consequently, the total squid catch was 10,405 tons, which comprised 97.1% of the total Polish *Illex* catch in the NAFO Area.

Squid (*Illex illecebrosus*). The Polish fishery in Subarea 4 was confined to Div. 4W, being conducted with midwater trawls and extending from the beginning of July to late October (Table 15). Five stern trawlers participated in the fishery. Catch rates varied from 25 to 40 tons per day, the mean for all vessels being 31.3 tons per day. This was about one-third higher than in 1978 (20 tons per day).

Biological sampling was conducted on the trawler *Orka* during 6 July-30 September and on the trawlers *Gopto*, *Wigry* and *Murena* during 2 August-18 September 1979. Length measurements were made on 30,061 specimens, and observations on parasite occurrence were made on 5,900 specimens.

Length frequency distribution of *Illex* in the commercial catches were different for males and females and varied with the season (Table 16). According to M. Lipinski (unpublished data), and from the length frequencies in Table 16, it may be deduced that growth in males is about 2.5 cm/month in July, 1.7 cm/month in August and up to 1.0 cm/month in September. However, these apparent growth changes may reflect a gradual influx of different sub-populations to the fishing grounds rather than real growth.

Special Research Studies

The Polish research vessel *Wieczno* conducted one survey cruise during 14 September-12 December 1979, in cooperation with the Northeast Fisheries Center, Woods Hole, USA. The first part of the cruise (6-28 October) was aimed at: (a) collecting food and feeding information from sharks and swordfish, (b) collecting vertebral samples from sharks for age and growth studies, and (c) marking apex predators with standard dart tags. The fishing was carried out using pelagic longline gear. In 28 sets, 338 specimens of blue shark (*Prionace glauca*) were caught, of which 157 were tagged, and 36 water temperature measurements were made. In addition, 56 temperature measurements were made during a hydrographic survey across 2 eddies to which the vessel was directed.

The seond part of the cruise (30 October-11 November) was devoted to acoustic telemetry experiments, with depth and temperature transmitters attached to blue sharks. Deep muscle temperature of the sharks was also measured.

The third part of the cruise (13-21 November) consisted of the standard MARMAP-I ichthyoplankton survey of seasonal changes in the distribution and abundance of larval herring, larvae and juveniles of other fish species, and of their predators and prey. This survey was conducted in the region of the Gulf of Maine, Georges Bank, Nantucket Shoal and south of Long Island. Samples were collected, using the Bongo net, Neuston net, Nansen bottles and XBT, at 33 stations.

Table 1. Polish catches in NAFO Subareas 1-5 and Statistical Area 6 in 1978 and 1979[1].

Species	1978 Tons	1978 %	1979 Tons		1979 %
Cod	4,517	24.9	5,633	(1,282)	27.3
Redfish	708	3.9	319	(59)	1.5
American plaice	159	0.9	33	-	0.2
Witch flounder	3,490	19.3	1,856	(3)	9.0
Greenland halibut	5,215	28.8	1,813	(8)	8.8
Atlantic halibut	2	+	7	(1)	+
Skates	-	-	18	-	0.1
Silver hake	4	+	-	-	-
Roundnose grenadier	51	0.3	96	-	0.5
Wolffishes	39	0.2	19	-	0.1
Capelin	1,538	8.5	-	-	-
Mackerel	2	+	-	-	-
Swordfish	6	+	-	-	-
Squid-Illex	1,944	10.7	10,654	-	51.7
Other finfish	451	2.5	173	(32)	0.8
TOTAL	18,126	99.9	20,621	(1,385)	100.0

[1] Quantities in parantheses taken under cooperative arrangement with Canada are included in the totals.

Table 2. Polish allocations versus catches in NAFO area in 1979 (metric tons).

Species	Stock division	Catch quotas	Catches	Catch/quota (%)
Cod	2GH	4,000	1,372	34.3
	2J+3KL	3,000	2,974	99.1
	3M	1,400	5	0.4
Witch flounder	2J+3KL	3,500	1,855	53.0
Greenland halibut	2+3KL	1,850	1,805	97.6
Roundnose grenadier	2+3	2,000	96	4.8
Capelin	2+3K	1,820	-	-
Squid-Illex	3+4	10,500	10,486	99.9
	5+6	2,759	167	6.0
Squid-Loligo	5+6	75	-	-
Mackerel	5+6	35	-	-
Butterfish	5+6	37	-	-
River herring	5+6	14	-	-
Other finfish	5+6	1,551	-	-

Table 3. Polish catches in SA 2, 1979 (metric tons).

Species	Subarea 2			Total
	2G	2H	2J	
Cod	1	1,371	2,347 (46)[1]	3,719
Redfish	-	26	62	88
American plaice	-	2	17	19
Witch flounder	-	1	18	19
Greenland halibut	68	582	88	738
Roundnose grenadier	10	14	1	25
Squid-Illex	-	1	-	1
Other finfish	-	82	6	88
TOTAL	79	2,079	2,539 (46)	4,697

[1] Catch in parentheses taken under cooperative arrangement with Canada is included in the total.

Table 4. Polish cod catches in SA 2 and 3, 1979 (metric tons).

Div.	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
2G	-	-	-	-	-	-	-	-	-	1	-	-	1
2H	26	-	-	-	-	-	-	11	290	339	615	90	1371
2J	1207	1094	34	12	-	-	-	-	-	-	-	-	2347
3K	-	399	1004	365	4	21	-	-	-	-	-	-	1793
3L	-	-	116	-	-	-	-	-	-	-	-	-	116
3M	-	-	-	-	-	-	-	5	-	-	-	-	5
TOTAL	1233	1493	1154	377	4	21	-	16	290	340	615	90	5633

Table 5. Length-frequencies of cod commercial catches, 1979, per mille (Div. 2J, 3K, 3L).

Length (3 cm)	2J	3K			3L
	Feb	Feb	Mar	Apr	Mar
27-	+			+	
30-	3		1	1	+
33-	11	1	10	4	1
36-	74	11	43	25	3
39-	132	45	91	96	19
42-	106	61	110	135	72
45-	111	83	127	144	130
48-	131	129	146	165	180
51-	125	167	145	161	191
54-	118	161	115	106	169
57-	88	137	88	74	120
60-	50	90	60	39	62
63-	24	49	31	26	23
66-	11	27	15	11	14
69-	5	14	8	6	7
72-	2	8	4	3	2
75-	3	5	3	3	1
78-	2	5	1	1	2
81-	2	3	1	+	1
84-	1	1	+	+	1
87-	1	1		+	1
90-	+	1	1		1
93-		1			
96-		+			
99-	+		+		
102-					
105-			+		
108-					
111-		+			
TOTAL	1,000	1,000	1,000	1,000	1,000
Number measured	7,045	5,110	5,855	2,173	2,916
Average length(cm)	49.2	53.9	50.3	49.6	52.4

Table 6. Age composition of cod commercial catches, 1979, per mille (Div. 2J, 3K, 3L).

Div.	Month	Age											
		3	4	5	6	7	8	9	10	11	12	12+	Total
2J	Feb	6	231	308	319	106	16	4	4	3	2	1	1,000
3K	Feb	1	93	284	429	133	38	9	5	5	2	1	1,000
3K	Mar	7	196	330	343	94	22	4	1	2	1		1,000
3K	Apr	2	220	397	268	96	14	3					1,000
3L	Mar	2	109	554	284	38	10	2	1				1,000

Table 7. Polish Greenland halibut catches in SA 2 and 3, 1979 (metric tons).

Div.	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
2G	-	-	-	-	-	-	-	63	2	3	-	-	68
2H	2	-	-	-	-	-	-	6	448	95	30	1	582
2J	65	8	-	-	-	-	-	15	-	-	-	-	88
3K	-	90	93	22	364	379	23	97	-	-	-	-	1,068
3L	-	-	7	-	-	-	-	-	-	-	-	-	7
TOTAL	67	98	100	22	364	379	23	181	450	98	30	1	1,813

Table 8. Length frequencies of Greenland halibut commercial catches in October 1979, per mille (Div. 2G, 2H).

Length class (2 cm)	2G		2H	
	Male	Female	Male	Female
30-	-	-	2	-
32-	-	-	4	2
34-	-	-	2	-
36-	-	-	11	20
38-	-	-	6	5
40-	42	-	11	10
42-	-	-	8	23
44-	28	37	15	35
46-	14	-	25	48
48-	29	37	32	38
50-	69	74	40	58
52-	97	37	46	76
54-	14	37	55	78
56-	97	74	61	83
58-	222	185	89	53
60-	97	186	90	101
62-	111	74	122	73
64-	125	111	107	68
66-	55	74	110	60
68-	-	-	70	58
70-	-	37	57	48
72-	-	-	25	25
74-	-	37	4	13
76-	-	-	4	8
78-	-	-	4	8
80-	-	-	-	5
82-	-	-	-	-
84-	-	-	-	2
86-	-	-	-	-
88-	-	-	-	2
Total	1,000	1,000	1,000	1,000
Number measured	72	27	526	397
Average length(cm)	56.8	59.0	58.9	57.6

Table 9. Age composition of Greenland halibut commercial catches in October 1979, per mille (Div. 2H).

Sex	Age 4	5	6	7	8	9	10	11	11+	Total
Male	13	79	106	229	341	152	42	34	4	1,000
Female	43	64	144	316	216	132	57	19	10	1,000

Table 10. Polish catches in SA 3, 1979 (metric tons)*.

Species	3K		3L		3M	3N	3O	Total	
Cod	1,793	(1,120)	116	(116)	5	-	-	1,914	(1,236)
Redfish	214	(59)	4		13	-	-	231	(59)
American plaice	12		-		2	-	-	14	
Witch flounder	1,749	(3)	88		-	-	-	1,837	(3)
Greenland halibut	1,068	(8)	7		-	-	-	1,075	(8)
Atlantic halibut	7	(1)	-		-	-	-	7	(1)
Skates	16		2		-	-	-	18	
Roundnose grenadier	68		3		-	-	-	71	
Wolffishes	17		2		-	-	-	19	
Squid-*Illex*	-		-		13	31	37	81	
Other finfish	85	(32)	4		-	-	-	89	(32)
TOTAL	5,029	(1,223)	226	(116)	33	31	37	5,356	(1,339)

* Quantities in parentheses taken under cooperative arrangement with Canada are included in the totals.

Table 11. Polish witch flounder catches in SA 2 and 3, 1979 (metric tons).

Div.	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
2H	-	-	-	-	-	-	-	-	-	-	-	1	1
2J	-	18	-	-	-	-	-	-	-	-	-	-	18
3K	-	561	929	177	49	15	2	16	-	-	-	-	1749
3L	-	-	88	-	-	-	-	-	-	-	-	-	88
TOTAL	-	579	1017	177	49	15	2	16	-	-	-	1	1856

Table 12. Length frequencies of witch flounder commercial catches in October 1979, per mille (Div. 3K).

Length class (2 cm)	3K	
	Male	Female
34-	-	8
36-	17	-
38-	50	8
40-	160	39
42-	244	94
44-	134	129
46-	126	151
48-	84	127
50-	84	110
52-	34	91
54-	34	94
56-	17	52
58-	-	47
60-	8	27
62-	8	17
64-	-	-
66-	-	6
TOTAL	1,000	1,000
Number measured	119	363
Average length(cm)	44.6	48.8

Table 13. Age composition of witch flounder commercial catches in February 1979, per mille (Div. 3K).

Sex	Age										
	7	8	9	10	11	12	13	14	15	15+	Total
Male	17	271	176	231	78	62	44	54	67	-	1,000
Female	8	21	73	136	239	97	60	45	71	250	1,000

Table 14. Polish redfish catches in SA 2 and 3, 1979 (metric tons).

Div.	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
2H	13	-	-	-	-	-	-	1	8	1	3	-	26
2J	41	18	-	-	-	-	-	3	-	-	-	-	62
3K	-	53	101	47	11	2	-	-	-	-	-	-	214
3L	-	-	4	-	-	-	-	-	-	-	-	-	4
3M	-	-	-	-	-	-	-	13	-	-	-	-	13
TOTAL	54	71	105	47	11	2	-	17	8	1	3	-	319

Table 15. Polish squid-*Illex* catches in SA 2-5, 1979 (metric tons).

Div.	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
2H	-	-	-	-	-	-	-	-	-	1	-	-	1
3M	-	-	-	-	-	-	-	3	8	2	-	-	13
3N	-	-	-	-	-	-	-	31	-	-	-	-	31
3O	-	-	-	-	-	-	-	-	-	37	-	-	37
4W	-	-	-	-	-	-	2398	2402	3638	1967	-	-	10,405
5Z	-	-	-	-	-	-	-	112	55	-	-	-	167
TOTAL	-	-	-	-	-	-	2398	2548	3701	2007	-	-	10,654

Table 16. *Illex illecebrosus* length frequencies from Polish commercial catches in Div. 4W, 1979 (per mille).

Mantle length (cm)	SAMPLING DATE															
	July 7		July 18		July 30		August 19		August 30		September 4		September 8		September 15	
	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F
14.0																
.5			10													
15.0			25	7												
.5			15	22												
16.0	8		40	15												
.5	12		15	15												
17.0	21		40	7		7										
.5	41	53	70	44	5	-										
18.0	99	100	164	124	-	7	7		4							
.5	160	167	194	175	-	-	7	31	-							
19.0	230	187	164	182	23	46	49	47	8	7	4					
.5	189	147	174	153	59	53	81	16	59	29	19		15		4	
20.0	140	113	40	117	81	132	137	31	72	36	45	16	34		15	
.5	41	73	20	66	226	106	158	63	194	43	87	16	44	5	50	7
21.0	21	80	10	36	258	126	246	141	253	115	166	24	117	32	146	43
.5	8	40	10	15	136	146	218	109	169	216	177	126	249	54	287	72
22.0	12	40	5		131	152	49	125	122	194	196	126	171	135	180	130
.5	8		5		32	99	7	125	63	151	128	134	166	146	172	152
23.0	8			7	14	73	14	94	30	94	113	181	102	146	96	116
.5				15	18	7	7	47	21	36	38	118	49	103	23	51
24.0					14	33	21	78	4	29	11	94	20	103	11	116
.5					6	7		31		29	11	63	20	97	11	51
25.0						7		31		14	4	47	15	86	4	94
.5								16		7		8		38		72
26.0								16				8		27		29
.5												24		5		29
27.0												8		5		-
.5												-		5		7
28.0												-				22
.5												8				-
29.0																-
.5																7
Number measured	243	150	201	137	221	151	285	128	237	139	265	127	205	185	261	138