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Polish Research Report, 1990

by

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Introduction

The overall catch by Polish fishing vessels in NAFO Subareas 2 to 6 in 1990 declined to only 504 metric tons compared to 9329 metric tons in 1989 (Table 1). There were a few reasons of that dramatic decrease. In the northern portion of the NAFO Area (Subarea 2 and 3) they were: - a low and steadily diminishing catch quota level of the main species sought i.e. witch flounder and Greenland halibut, - the decreasing availability of both species resulting in a declining trend in CPUE, - a very poor and still lowering profitability of that fishery. These reasons eventually led to a decision on withdrawal of the last Polish fishing vessel operating there during a few preceding years. In the southern portion of the NAFO Area (Subarea 5 and Statistical Area 6) the main reason was an abrupt decline in the mackerel catch quota from 9000 tons in 1989 to 500 tons in 1990. As the result the only species taken by Polish fishery in NAFO area in 1990 was the small amount of Atlantic mackerel. Insignificant quantities of other by-catch species have not been retained on board and accordingly were not recorded.

Subarea 2

Status of Fisheries and Research

No Polish fishing vessel was involved in any fishing, scouting or research activity in this area in 1990.

Subarea 3

Status of Fisheries and Research

No Polish fishing vessel was involved in any fishing, scouting or research activity in this area in 1990.

Subarea 4

Status of Fisheries and Research

An exploratory fishing for mackerel in Divisions 4X and 4W

within a Canadian research program was conducted by m.t."Korwin" (B-29 type) in Divisions 4X and 4W between April 6 - 14. Only 4 tons of mackerel was caught in Division 4W (Table 2).

The biological samples collected there were handed over to the Canadian scientific observer present on board and therefore have not been processed and analysed by SFI in Gdynia.

Subarea 5 and Statistical Area 6

Status of Fisheries and Research

The total catch of mackerel taken by the only Polish vessel m.t. "Korwin" engaged in this fishery was precisely at the quota level and amounted to 500 tons. The major part of the catch (97.2%) originated from Division 5Zw. The share taken in Subdivision 6A constituted only 2.0 % of the total (Table 2).

More than 70% of the total was caught in Division 5Zw in April. The proportion taken in May amounted to 27.2 %.

Biological sampling of mackerel has not been confined only to the catches taken from on board m.t. "Korwin". Samples were also collected from quantities taken by US fishing boats and supplied for two Polish B-29 trawlers m.t. "Laskara" and m.t. "Korwin" (Table 3). The US trawlers catches originated mainly from Divisions 6A and 6B. Sampling comprised length measurements, collecting of otoliths for ageing, determination of gonad's maturity and degree of stomachs fulness.

For length measurements 14,629 mackerel specimens were collected (Table 4). The fork length of the mackerel in samples ranged from 19 to 45 cm. The length distribution of mackerel taken in February in shallow waters within 20 - 30 NM from the shore in NAFO Div. 6B and 6C was much more diversified than a year ago and comprised 4 modes (Table 4). The first one consisted of 19 - 24 cm specimens (age group 1 - up to 5.6 %, Table 3) was the least abundant. The second mode comprised fish of 25 - 29 cm (age group 2 - up to 13.1 %) and the third one of 30 - 35 cm mackerels (mainly age group 3 - up to 24.9 %). The most abundant were length-classes from 36 to 42 cm (age groups 5 - 10 - up to 56.1%).

In catches supplied by US vessels from NAFO Div. 6A and 6B in March all four length modes were also present but the share of the three bigger modes (age groups 2, 3 and 5-10) was at a similar level (25 - 33.7%).

Mackerel samples collected from m.t. "Korwin" catches in NAFO Div. 5Zw in April were dominated by specimens 36 - 40 cm in length (64.3 %). In the same Division in May the three bigger mode again prevailed but in the reverse order. The most abundant were two years old fish from the mode 23 - 30 cm (46.7 %) while age group 3 constituting the mode 31 - 34 cm were less abundant (31.4%), followed by the least abundant mode 36 - 40 cm consisted of older age groups (Table 3).

The age composition of mackerel catches supplied for m.t. "Laskara" by US fishing boats in Divisions 6B and 6C in February was dominated by age group 3 from 1987 year-class (up to 24.9 %) followed by 5 and 6 followed by 5 and 6 year old fish from 1985 and 1984 year-classes (up to 19.3 and 17.1 % respectively), (Table 3).

In March more than 50% of the catches constituted of 1987

year-class (up to 27,5 %) followed by 1988 year-class (up to 25.8 %). Prevalence of these two year-classes was even more pronounce in May in Div. 5Zw were their total share exceeded 78 %.

Much older mackerels dominated catches supplied for m.t. "Korwin" in April. During that month in Div. 6A the most abundant year-classes were 1984 and 1983 (age group 6 and 7) constituting 30.1 6 and 24.1 % of the total respectively. In the same month in Div. 5Zw the prevailing age group in catches taken by m.t. "Korwin" were 7 year-old mackerels from 1983 year-class (22.1 %), followed by almost equal shares of age groups 3, 4 and 5 (14.5 - 16.9 %) and somewhat less abundant 6 and 8 years old mackerels (12.3 and 11.8 % respectively), (Table 3).

The general picture of the gonads maturation rate was quite different compared to the preceding years. The relative high abundance of mackerel specimens in the second and third stage of maturity (up to 36.2 % and 35.3 %) maintained throughout the season from February to May (Table 5). Almost no maturing or mature fish (maturity stages 5 and 6) were found even as late as in April and May. These features together with very high abundance of mackerel in stage 4 (80.4 %) in April may reflect either unfavorable hydrological conditions in the area fished or may result from a bias in examining of gonads maturity stages by an inexperienced technician.

Somewhat peculiar changes of the stomach fulness distribution were also observed. The highest feeding intensity (44.9 % of stomachs at third degree of fullness and 50.9 % at fourth degree) was found in SA 6B in February. The share of these 2 degrees continuously declined during the season to as low values as 12.1 and 2.3 % respectively, while share of mackerels with empty stomachs (degree 0) or only slightly filled with food showed and increasing trend (Table 6). Since the erroneous estimation of the degree of stomach fullness is much less probable than that in determination of gonads' maturity one may conclude that the observed changes could have resulted from unknown environmental factors influencing the food availability.

Table 1 Polish catches in NAFO Area in 1989 and 1990
(metric tons)

Species	1989		1990	
	Tons	%	Tons	%
Atlantic redfish	8	0.1	-	-
American plaice	84	0.9	-	-
Witch flounder	691	7.4	-	-
Greenland halibut	360	3.9	-	-
Roundnose grenadier	17	0.2	-	-
Atlantic herring	288	3.1	-	-
Atlantic mackerel	7653	82.0	504	100.0
Spiny dogfish	47	0.5	-	-
Blueback herring	6	0.1	-	-
Alewife	18	0.2	-	-
Porgies	84	0.9	-	-
Silver hake	8	0.1	-	-
Sea robins	6	0.1	-	-
Haddock	4	+	-	-
BSX	1	+	-	-
Other finfish	53	0.6	-	-
Squids	1	+	-	-
	9329	99.9	504	100.0

Table 2 Polish mackerel catches by NAFO division and month in 1990 fishing season

(metric tons)

Division	Month		Grand total
	April	May	
4W	4	-	4
5Zw	353	137	490
6A	10	-	10
Total	367	137	504

Table 3 Age composition of mackerel catches taken by Polish trawler m.t."Korwin" or supplied to m.t. "Korwin" and m.t. "Laskara" by US fishing vessels in 1990 (per mille)

Division	Month	Vessel name	Origin (caught/ supplied)	Age group / year-class							
				1/89	2/88	3/87	4/86	5/85	6/84	7/83	8/82
6C	February	Laskara	supplied	55.9	98.7	248.9	29.6	193.7	171.1	105.3	77.6
6B	February	Laskara	supplied	55.6	131.4	183.2	80.5	147.8	163.9	130.3	75.2
6B	March	Laskara	supplied	40.0	250.2	275.4	92.2	66.8	56.0	134.6	62.1
6A	March	Laskara	supplied	37.7	258.2	271.8	93.1	55.0	109.3	108.3	58.8
6A	April	Korwin	supplied	-	4.2	56.6	75.0	112.4	301.2	240.6	164.6
5Zw	April	Korwin	caught	-	40.9	168.6	144.9	168.6	122.8	221.1	118.3
5Zw	May	Korwin	caught	0.9	466.9	313.8	71.9	54.1	22.1	35.6	34.1

Division	Month	Vessel name	Origin (caught/ supplied)	Age group / year-class						
				9/81	10/80	11/79	12/78	13/77	14/76	15/75
6C	February	Laskara	supplied	-	14.0	-	1.8	3.5	-	-
6B	February	Laskara	supplied	16.9	9.8	1.0	0.3	0.5	3.7	-
6B	March	Laskara	supplied	14.7	3.2	-	1.2	3.0	0.7	-
6A	March	Laskara	supplied	3.2	0.7	-	2.0	-	1.1	0.5
6A	April	Korwin	supplied	25.1	1.8	10.7	3.5	1.2	0.7	2.4
5Zw	April	Korwin	caught	9.6	2.6	0.2	1.4	0.7	-	0.2
5Zw	May	Korwin	caught	0.3	-	0.4	-	-	-	-

Table 4 Length frequencies of Polish mackerel catches in NAFO Divisions 5Zw and 6A in 1990 (per mill)

Length -class	Division / month				
	6C Feb.	6B Mar.	6A Apr.	5Zw Apr.	5Zw May
19	0.2	0.2	-	-	-
20	1.4	1.2	-	-	-
21	1.9	1.4	-	-	-
22	0.9	0.8	-	-	-
23	0.5	0.2	-	-	0.1
24	0.6	0.2	-	0.1	0.1
25	0.6	0.7	-	0.1	0.2
26	2.1	3.5	-	0.2	2.6
27	5.2	9.8	0.1	1.2	15.0
28	3.9	7.7	0.1	1.8	19.6
29	2.1	3.8	0.1	1.1	9.7
30	2.8	4.1	0.2	0.9	5.4
31	4.6	7.4	0.8	2.3	8.6
32	5.6	8.8	0.7	4.6	10.0
33	4.8	6.0	3.4	8.1	7.5
34	3.1	3.1	2.0	6.2	4.5
35	3.8	4.7	6.0	8.7	3.2
36	6.4	5.5	9.1	10.8	3.3
37	14.8	9.9	21.9	19.6	4.5
38	18.6	11.0	30.3	20.7	3.1
39	10.5	6.4	17.6	10.1	1.9
40	3.6	2.1	5.2	2.7	0.6
41	0.8	0.7	1.7	0.5	0.1
42	0.4	0.4	0.6	0.2	0.1
43	0.4	0.3	0.2	0.2	0.0
44	0.2	0.1	0.2	0.1	-
45	0.1	0.1	-	-	-
Total (%)	100.0	100.0	100.0	100.0	99.9
Number measured	4331	4430	1428	1022	3419

Table 5 Gonad's maturity of mackerel caught in NAFO Divisions 6A, 6B, 6C and 5Zw in 1990
(per mille)

Division	Month		Maturity stage						
			I	II	III	IV	V	VI	VII
6C	Feb.	(%.)	66.5	335.6	353.4	244.5	0.0	0.0	0.0
		(No.)	8	22	24	15	0	0	0
6B	Feb.	(%.)	55.1	170.6	249.0	524.1	1.1	0.0	0.0
		(No.)	19	61	67	107	2	0	0
6B	Mar.	(%.)	51.5	231.1	283.5	433.9	0.0	0.0	0.0
		(No.)	12	29	38	62	0	0	0
6A	Mar.	(%.)	57.7	247.2	281.2	413.9	0.0	0.0	0.0
		(No.)	8	24	38	68	0	0	0
5Zw	Apr.	(%.)	11.9	38.3	145.4	804.2	0.0	0.0	0.2
		(No.)	3	23	64	204	0	0	1
5Zw	May	(%.)	0.0	362.2	321.7	311.4	4.7	0.0	0.0
		(No.)	0	50	54	96	1	0	0

Remarks: - numbers (No.) refer to number of fish analysed
- shares have been calculated on maturity-length key basis

Table 6 Stomach fullness of mackerel caught in NAFO Divisions 6A, 6B, 6C and 5Zw in 1990
(per mille)

Division	Month		Degree of stomach fullness				
			0	1	2	3	4
6C	Feb.	(%.)	128.2	76.5	221.6	373.3	199.4
		(No.)	7	3	18	25	15
6B	Feb.	(%.)	0.8	2.6	37.9	449.8	508.9
		(No.)	1	1	12	106	135
6B	Mar.	(%.)	35.1	349.1	144.0	280.8	191.1
		(No.)	9	45	23	37	27
6A	Mar.	(%.)	181.2	400.1	272.0	140.9	5.8
		(No.)	21	50	46	20	1
5Zw	Apr.	(%.)	257.0	347.4	160.3	130.1	105.2
		(No.)	84	108	44	33	26
5Zw	May	(%.)	183.7	442.1	230.4	120.8	22.9
		(No.)	33	85	48	29	6

Remarks: - numbers (No.) refer to number of fish analysed
- shares have been calculated on stomach fullness-length key basis