Northwest Atlantic Fisheries Organization

Serial No. N669

NAFO SCR Doc. 83/VI/20

SCIENTIFIC COUNCIL MEETING - JUNE 1983

Spanish Investigations on Cod in Divisions 3M and 3N in 1982

by

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Introduction

Since April to August 1982 J. Fontenla was an observer on board of the PTB-4 "TERRA-NOVA", and E. J. Varela another one on board of the PTB-5 "BAHIA DE GUIPUZCOA-BAHIA DE SAN SEBASTIAN". They sampled cod lengths, got samples of otoliths and carried out many observations to improve statistics. All the otoliths were read by Fontenla and Varela, with the aid of our colleague A. Vázquez. Spanish catch and sampling data for 3M and 3N cod in 1982 are shown in Table 1.

Results

Age composition of cod catches is shown in Table 2. Relative age composition of Spanish cod catches in Div. 3M and 3N is shown in Figure 1. In Div. 3M the most important age group is that of 4 years, fishes belonging to the 1978 annual class, and in Div. 3N those of 4 and 8 years, the last ones belonging to the 1974 annual class.

Relationship between age and length for cod sampled in 1982 is shown in Table 3. Although in Div. 3M there is rather little sampling it seems that growth rate has been greater in Div. 3M than in Div. 3N for young fish and smaller for the oldest one.

Cod catches and fishing effort in Div. 3N are shown in Table 4. The overall fishing effort of the Spanish vessels has been calculated using factors of the multiplicative model proposed by Váquez and Larrañeta (1980). The year factor for 1982, equivalent to a catch per unit effort index, has been estimated to be 0.52. This means that if an effort of 100,000 units would be spent in the 3NO cod fishery in 1982 the catch would have been 52000 tm. As in this model 86667 units have been calculated to be 2/3 of the MSY effort, the

resulting total allowable catch will be 45067 tm. As since 1976 fishing effort is showing a rather constant level, fish density cannot be far from an equilibrium state. So, 45000 tm could be taken as a realistic point in an effort/catch--per-unit effort relationship.

Otherwise since the Spanish vessels were only fishing in the area off 200 mile limit, necessarily the most exploited segment of the 3NO cod stock, it is reasonable to suppose that a level of 45000 tm will be a minimum estimation of a total allowable catch.

Acknowledgement

We are indebted to A. Vázquez for his valuable help in reading otoliths and in calculations.

References

Vázquez, A. and M. G. Larrañeta. 1980.- Assessment of cod stock in Divisions 3NO. NAFO SCR Doc. 80/II/10.

Table 1. Spanish commercial sampling for 3M and 3N cod in 1982

Div.	No. measured	No. aged	Samplig weight (kg)	Catch (tm)
3M	2864	122	1909	4513
3N	18091	1243	18094	14361

Table 2.- Age composition ($x10^{-3}$) of cod catches in sampled months.

Age	3M May	3N April	3N May	3N June	3N July	3N August
1	-	-	-	-	-	-
2	-	2.9	20.8	67.4	83.3	1.0
3	1.6	5.4	154.2	51.1	81.1	7.8
4	300.2	18.0	540.4	79.3	285.6	33.5
5	165.0	19.9	401.9	70.4	69.2	4.7
6	34.1	10.8	168.0	43.0	37.9	3.4
7	2.1	23.0	200.9	103.0	83.3	37.6
8	8.5	43.4	161.1	154.1	67.7	57.8
9	9.6	28.7	43.3	80.0	21.6	54.9
10	2.1	18.0	15.6	36.3	4.5	21.4
11	-	24.4	17.3	41.5	1.5	9.7
12	-	3.5	3.5	5.2	-	1.8
13	-	1.2	1.7	0.7	0.7	3.4
14	-	2.3	1.7	2.2	-	2.4
15	-	2.3	1.7	1.5	-	-
16+	-	1.2	1.7	0.7	-	2.4
Catch	1016	1110	4322	3004	1588	1289

Table 3.- Average sizes at ages 2-10 years, from 1982 sampling

	3M May		3N April-June		3N July-Aug.	
Age	mm	N	mm	N	mm	N
2	-	-	274	90	271	31
3	440	3	349	98	343	25
4	521	41	451	117	471	49
5	634	29	542	109	571	21
6	685	12	649	88	652	20
7	835	4	765	140	764	56
8	833	12	859	146	849	53
9	849	17	969	68	964	31
10	985	4	1035	33	1027	10

Table 4.- Fishing effort (hours) and cod Catches (tm) of the Spanish vessels in Division 3N during 1982.

Month	OTB2-4		PTB-4		PTB-5	
	Effort	Catch	Effort	Catch	Effort	Catch
Jan			239	79.7		
Feb			464	124.7	37	46.9
Mar			796	261.9	1798	686.7
Apr	253	86.7	2146	667.4	1260	355.4
May	188	36.0	3382	2194.6	3150	2092.1
Jun	94	5.1	1742	1526.0	2248	1472.8
Jul	63	8.7	300	295.6	1340	1283.6
Aug			420	331.1	939	958.3
Sep			272	167.1	148	48.1
Oct			361	221.8	100	50.5
Nov			1087	655.5	825	353.9
Dic			275	47.3	383	303.8
Total	598	136.5	11484	6572.7	12228	7652.0

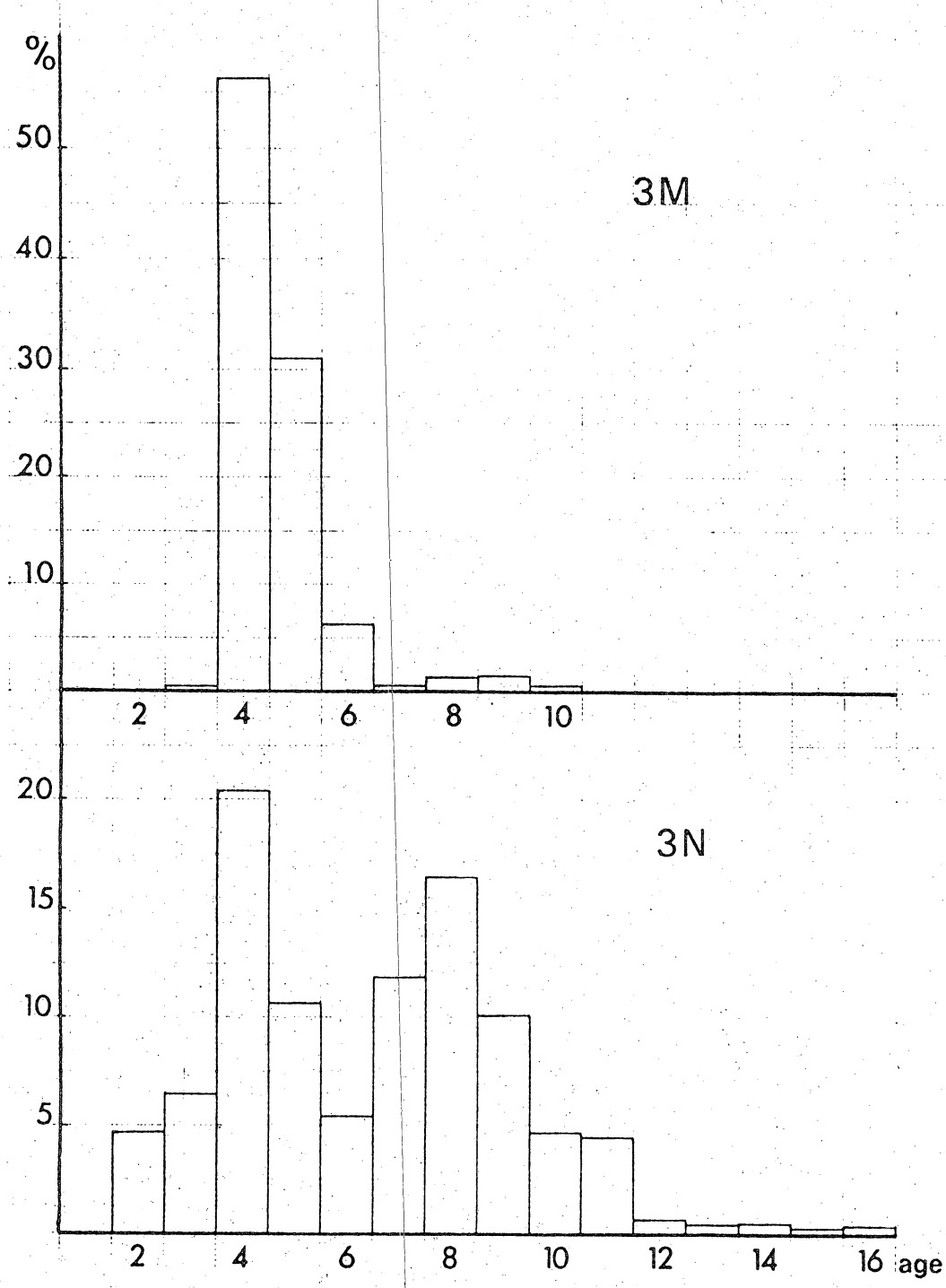

Figure 1.- Age composition of cod catches in Div. 3M and 3N, in 1982. From Spanish vessels.