

Northwest Atlantic



Fisheries Organization

Serial No. N1504

NAFO SCS Doc. 88/17

SCIENTIFIC COUNCIL MEETING - JUNE 1988

Cuban Research Report for 1987

by

R. Tizol

Centro de Investigaciones Pesqueras
Barlovento, Santa Fe., Habana, Cuba

and

R. Dominguez and A. Alvarez

Flota Cubana de Pesca
Habana Vieja, Cuba

and

B. Moreno

Ministerio de la Industria Pesquera
Barlovento, Santa Fe., Habana, Cuba

A. Status of the Fisheries

The Cuban Fishing Fleet (FCP) operated in Subareas 3 and 4 of the Northwest Atlantic Ocean during 1987, with fisheries directed towards redfish and silver hake. The total nominal catch was 28 129 MT, the highest in the last 4 years in this areas, due to the very good results from the silver hake fishery (table 1).

The fishing operations were carried out by 8 stern trawlers, all being tonnage class 7. The total fishing effort was 838 fishing days (DF), 968 days on ground (DG), and 7989 fishing hours (HF), the smallest in the last 4 years (table 2).

There was not directed fishery for squid in 1987, because this species was not found in sufficient abundance in Subareas 3 and 4.

1. Subarea 3

The directed fisheries for redfish were carried out in Divs. 3M, 3N and 3O mainly outside the Canadian 200-miles fishing zone. Some fishing effort was performed by one vessel inside the Canadian 200-miles fishing zone in Div. 3O, obtaining results slightly higher than the ones obtained by the rest of them. The total nominal catch was 7 054 MT lower than the 1986 catch level but higher than the ones for 1984 and 1985 (table 1). Midwater trawls were used in all divisions.

The fishing effort and catch rates by divisions are given in tables 2 and 3. The nominal catches and percents by species are shown in table 4 for the last 4 years, redfish reached the 99.9% of the total catch in 1987, more similar to the 1984 species composition than the ones for 1985 and 1986. The nominal catches and percents by divisions are shown in table 5.

The redfish fishery was carried out during July in Div. 30, 3N and 3M. During August the fisheries were in Div. 30, 3N and 3M and in the first days of september it was in Div. 30.

2. Subarea 4

The silver hake fishery was the directed fishery in this Subarea, it was conducted totally in Div. 4W. The 1987 nominal catch reached 28 129 MT, the highest in the last 4 years, 3 574 MT over the 1986 one and represented the 75% of the total nominal catch in the area (table 1).

Cuban vessels began to fish on April the first, obtaining very good results and very low by catches of other species. Dogfish represented a small problem during the first part as well it was in 1986.

The best results in catch and catch rate were obtained in May, April was also a good month. The fishing effort and cpue for Subarea are shown in Tables 2 and 3, and the nominal catches and percents by species are given in table 6. Silver hake represented the 95.9% of the total nominal catch.

B. Special Research Studies

Biological samples were taken for analyses of size composition, ageing and lenght-weight relationship for silver hake (Div. 4W) and redfish (Div. 3M), on board Cuban commercial vessels TACSA-95, between May and July.

A total of 41 samples were taken, involving 20 928 individual measurements and the collection of 154 pairs of silver hake otoliths (table 7).

Results obtained on size composition samples of silver hake and redfish were grouped by weeks (table 8 and 9). The mean lenght and weight at age for silver hake are contained on table 10 and mean weight at lenght for redfish on table 11.

Age composition (%) of commercial silver hake catches in Div. 4W are shown in table 12.

/015Table 1. Nominal catch per Subarea 1984-1987

Year	Subarea 3		Subarea 4		Total	
	MT	%	MT	%	MT	%
1984	5258	26	15263	74	20521	100
1985	5120	22	18389	78	23509	100
1986	7648	31	16907	69	24555	100
1987	7054	25	21075	75	28129	100

/015Table 2. Fishing effort per Subarea and Division 1984-1987

Subarea	Div	DF				DB				HF			
		1984	1985	1986	1987	1984	1985	1986	1987	1984	1985	1986	1987
3	N	111	82	57	58	147	99	61	80	1102	660	424	507
3	N	161	150	119	95	188	198	180	137	1154	1217	1106	827
3	O	59	74	170	128	70	107	193	164	602	848	1442	1011
4	W	495	591	503	557	545	663	573	587	5631	7526	5649	5646
TOTAL		826	897	849	838	950	1067	1007	968	8489	10251	8623	7989

/015Table 3. Catch per unit effort per Subarea and Division

Subarea	Div	CATCH/DF				CATCH/DB			
		1984	1985	1986	1987	1984	1985	1986	1987
3	N	14.1	22.4	31	30.3	1.4	2.8	4.2	3.5
3	N	14.7	14.4	21.7	25.7	2	1.8	2.3	2.9
3	O	22.3	15.6	19.4	22.3	2.2	1.3	2.3	2.9
4	W	30.8	31.1	33.6	37.8	2.7	2.4	3	3.7

7015Table 4. Nominal catch per species for Subarea 3: 1984-1987.

	1984		1985		1986		1987	
	MT	%	MT	%	MT	%	MT	%
Atlantic cod	16	.3	135	2.6	49	1	.1	-
Haddock	7	.1	12	.2	1	-	-	-
Atlantic redfishes	5198	98.9	4642	91.6	7199	94	7048	99.9
Silver hake	-	-	44	.9	280	4	-	-
Red hake	-	-	24	.6	4	-	.3	-
Pollock	-	-	4	.1	2	-	-	-
American plaice	11	.2	30	.6	7	-	-	-
Witch flounder	-	-	31	.6	46	.6	-	-
Yellowtail flounder	11	.2	12	.2	4	-	-	-
Atlantic halibut	4	.1	26	.5	36	.4	-	-
Flatfishes nei	-	-	28	.6	8	-	-	-
White hake	-	-	7	.1	-	-	-	-
Groundfishes nei	8	.2	12	.2	8	-	-	-
Atlantic mackerel	-	-	1	0	-	-	-	-
Argentine	1	0	33	.7	2	-	-	-
Capelin	-	-	3	0	-	-	-	-
Skates nei	-	-	26	.5	-	-	-	-
Angler	-	-	-	-	2	-	-	-
Granadier	-	-	-	-	-	-	4	.1
Squids (Illex)	-	-	-	-	-	-	1.6	-
TOTAL	5258	100	5120	100	7648	100	7054	100

7015Table 5. Catch per Division, Subarea 3. 1984-1987

Year	3 M		3 N		3 D		TOTAL	
	MT	%	MT	%	MT	%	MT	%
1984	1567	29.8	2373	45.1	1318	25.1	5258	100
1985	1840	35.9	2168	42.3	1112	21.8	5120	100
1986	1770	23.1	2582	33.8	3296	43.1	7648	100
1987	2438	34.6	1757	24.9	2859	40.5	7054	100

/015 Table 6. Nominal catch per species for Subarea 4, 1984-1987.

Year	1984		1985		1986		1987	
	MT	%	MT	%	MT	%	MT	%
Atlantic cod	24	1.5	1	-	2	-	28.9	.1
Haddock	229	1.5	79	.4	78	.5	153.3	.7
Atlantic redfishes	11	.1	93	.5	4	-	13.4	.1
Silver hake	14496	94	17683	96	16041	95	20219	95.9
Red hake	106	.7	68	.4	129	1	194.6	.9
Pollock	123	.8	66	.3	387	2	341.5	1.6
American plaice	9	.1	31	.3	23	.1	7.3	.1
Witch flounder	-	-	3	-	-	-	4.9	-
Yellowtail flounder	3	-	6	.1	-	-	-	-
Atlantic halibut	-	-	14	.1	5	-	2.6	-
Flatfishes nei	-	-	6	-	8	-	2.5	-
American angler	-	-	15	.1	33	.2	19.7	.1
Cusk	-	-	24	.1	4	-	8.6	-
White hake	-	-	2	-	-	-	15.1	.1
Wolffishes	-	-	3	-	-	-	.2	-
Groundfishes nei	42	.1	2	-	3	-	.4	-
Atlantic herring	-	-	6	.1	53	.3	36.9	.2
Atlantic mackerel	32	.1	130	.7	80	.6	18.1	.1
Argentines	151	1	144	.8	53	.3	5.7	-
Skates nei	-	-	5	-	-	-	-	-
Short-Finned squid	34	.1	8	.1	-	-	-	-
Dogfish sharks nei	-	-	-	-	-	-	-	-
Summer flounder	3	-	-	-	-	-	-	-
Squids (Illex)	-	-	-	-	4	-	2.8	-
TOTAL	15263	100	18389	100	16907	100	21075	100

/015 Table 7. Biological survey data (1987).

	Silver hake Div. 4W	Redfish Div. 3M
No. of samples	29	13
No. of individuals	15008	5920
No. of otoliths pairs	154	--

Table 8. Length frequencies (by weeks) of silver hake in 1987 (Div. 4W)
 Total length measured to nearest cm. (1=males; 2=females).

L	01-05/06/87			06-12/06/87			13-19/06/87			20-26/06/87			27-31/06/87		
	1	2	Tot	1	2	Tot	1	2	Tot	1	2	Tot	1	2	Tot
16															
17		2	2												
18		2	2												
19		1	1												
20	3	3	6												
21	2	1	3												
22	6	3	9												
23	3	3	6	16	7	23	2		2				2		2
24	20	11	31	32	22	54	27	7	34	13	13	26	5		5
25	35	9	44	58	28	86	52	28	80	58	34	92	12	15	27
26	30	46	76	114	51	165	92	55	147	103	68	171	25	10	35
27	42	35	77	52	64	116	60	57	117	71	79	150	25	14	39
28	36	44	80	76	56	132	72	79	151	63	96	159	34	16	50
29	50	44	94	113	64	177	66	70	136	78	94	172	20	15	35
30	55	46	101	121	69	190	123	94	217	106	111	217	22	14	36
31	52	47	99	125	97	222	145	125	270	75	147	222	32	27	59
32	48	66	114	141	153	294	104	169	273	67	179	246	23	27	50
33	34	59	93	107	157	264	65	169	234	44	183	227	20	23	43
34	18	49	67	63	121	184	26	129	155	33	146	179	16	23	39
35	8	18	26	32	89	121	31	142	173	25	107	132	7	16	23
36	9	16	25	13	83	96	20	97	117	14	84	98	2	13	15
37	4	14	18	10	53	63	12	71	83	7	52	59	1	10	11
38	5	6	11	4	43	47	3	44	47	1	41	42	2	7	9
39	1	3	4		32	32		34	34		22	22		5	5
40	2	4	6	1	30	31		19	19		16	16		4	4
41		2	2		18	18		16	16		6	6		4	4
42					9	9		8	8		8	8		2	2
43		2	2		2	2	1	2	3		1	1		1	1
44					2	2		2	2						
45					2	2		1	1					1	1
46					2	2									
47					1	1									
n	463	536	999	1264	1255	2519	901	1418	2319	758	1487	2245	248	237	485
Mean L	29.4	30.6	30.1	29.9	32.5	31.3	29.8	32.5	31.5	29.4	31.9	31.1	29.6	32.3	30.9
#:sampl	3	3	3	7	7	7	8	8	8	7	7	7	1	1	1
mean W	173	203	189	181	196	188	15	222	194	196	223	213	165	244	193

Table 9. Length frequencies (by weeks) of redfish in 1987 (Div. 4W)
Total length measured to nearest cm. (1=males; 2=female)

L	01-05/07/87			06-12/07/87			13-19/07/87		
	1	2	Tot	1	2	Tot	1	2	Tot
18	-	1	1	-	3	3	-	-	-
19	3	3	6	16	8	24	7	8	15
20	7	9	16	7	15	22	16	15	31
21	11	11	22	18	39	57	35	29	64
22	22	23	45	44	69	113	51	60	111
23	57	24	81	80	108	188	164	96	260
24	68	42	110	142	159	301	197	165	362
25	69	26	95	221	258	479	305	202	507
26	49	23	72	302	248	550	254	135	389
27	22	6	28	294	209	503	145	86	231
28	14	7	21	163	90	253	67	44	111
29	3	1	4	78	42	120	43	13	56
30	5	2	7	45	36	81	10	7	17
31	4	-	4	44	29	73	11	5	16
32	2	-	2	52	31	83	9	6	15
33	2	-	2	66	37	103	17	6	23
34	2	-	2	41	37	78	3	6	9
35	3	-	3	23	27	50	4	1	5
36	1	-	1	17	20	37	1	1	2
37	-	-	-	12	6	18	2	3	5
38	-	-	-	5	3	8	1	-	1
39	-	-	-	4	4	8	2	-	2
40	-	-	-	1	3	4	1	-	1
41	-	-	-	3	-	3	1	-	1
42	-	-	-	-	-	-	1	-	1
43	-	-	-	-	2	2	-	-	-
44	-	-	-	-	1	1	-	-	-
n	344	178	522	1678	1484	3162	1347	888	2235
Mean L	24.8	23.8	24.5	27.1	26.5	26.8	25.04	24.9	25.2
# sampl	1	1	1	7	7	7	5	5	5
mean W	.186	.215	.196	.185	.214	.199	.185	.214	.152

Table 10

Table 10. Mean length (cm) and weight (gr) at age by sex of silver hake (Div. 4W) 1987.

	II	III	IV	V	VI	VII
L 1+2	27.04	30.75	34.12	36.33	39.14	41.7
W 1+2	114.3	180.1	261.2	296.9	419.2	480.5
L 1	27.35	29.68	34.15	35.5	38.3	-
W 1	112.4	190.4	277	289.8	413.2	-
L 2	26.6	29.1	34.1	37.1	39.5	41.7
W 2	99.7	169.7	247.3	396.8	451.5	480.5

1=males 2=females

/015TABLE 11. Mean weight at length class of redfish (Div. 3A) 1987.

L (cm)	21	22	23	24	25	26	27	28	29	30
W (gr)	107.3	110.5	133.5	174.5	194	218	247	269	300	303
L (cm)	31	32	33	34	35	36	37	38	39	
W (gr)	376	423	426	507	519	619	662.5	735	810	

kkkk

/015

TABLE 12. Age composition (%) of commercial silver hake catches in Div 4W (1987).

Age	I	II	III	IV	V	VI	VII	VIII
%	5.57	28	33.6	23	7.5	2	.16	.17