

Northwest Atlantic



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Cuban Research Report for 1985

by

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A. Status of the Fisheries

The Cuban fishing fleet operated in Subareas 3 and 4 of the Northwest Atlantic during 1985, with fisheries directed towards redfish and silver hake. The total nominal catch was 23,509 (metric) tons, the highest in the last 4 years, mainly 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 fishing effort totalled 897 fishing days (DF), 1,067 days on ground (DG), and 10,251 fishing hours (HF), the highest in the last 4 years (Table 2).

There was no directed fishery for squid in 1985, because they were not found in sufficient abundance in Subareas 3 and 4.

1. Subarea 3

The directed fishery for redfish was carried out in Div. 3M, 3N and 3O, totally outside the Canadian 200-mile fishing zone. The total catch was 5,120 tons, the lowest during the 1982-85 period (Table 1). Midwater trawls were used in all divisions. Redfish constituted 91.6% of the total catch in 1985, but the by-catch was more diverse than in the previous years.

The nominal catches and percents by species are shown in Table 4 for the 1982-85 period. The nominal catches and percents by division are shown in Table 5. The fishing effort and catch rates by division are given in Tables 2 and 3.

The redfish fishery was carried out during August in Div. 3M, from February to September (excluding May and June) in Div. 3N, and during March, April and September in Div. 3O.

2. Subarea 4

The directed fishery in this subarea was for silver hake. The total nominal catch was 18,389 tons, the highest in the last 4 years and an increase of 3,126 tons over the catch in 1984 (Table 1). Cuban vessels began successfully fishing on 1 April, with very low by-catches of other species, although dogfish presented a small

problem during the first week.

The best results (in catch) were obtained in June and the catch rates were highest during April, end of June and beginning of July. The fishing effort and catch-per-unit-effort for Subarea 4 are shown in Tables 2 and 3, and the nominal catches and percents by species are given in Table 6.

B. Special Research Studies

Biological samples were taken for analyses of size composition, maturity, morphometric studies, ageing, and length-weight relationship for silver hake on board three Cuban vessels, which operated in Div. 4W from April to July.

A total of 102 samples were taken, involving 66,011 individual measurements.

The results of this sampling are given in Tables 7-12 and Fig. 1-3.

Table #1. Nominal catch per sub-area. 1982-1985

Year	Sub-area 3		Sub-area 4		Total	
	M.T.	%	M.T.	%	M.T.	%
1982	6152	33	12413	67	18565	100
1983	6232	42	8554	58	14786	100
1984	5258	26	15263	74	20521	100
1985	5120	22	18389	78	23509	100

Table #2. Fishing Effort per Sub-area and Division. 1982-1985

Sub Area	Div	D.F.				D.G.				H.F.			
		1982	1983	1984	1985	1982	1983	1984	1985	1982	1983	1984	1985
3	M	74	224	111	82	--	250	147	99	549	2331	1102	660
	N	98	188	161	150	--	359	188	198	671	1325	1154	1217
	O	67	60	59	74	--	96	70	107	342	517	602	848
4	4W	511	416	495	591	--	515	845	663	5465	5429	5631	7526
TOTAL		750	888	826	897	--	1220	950	1067	7027	9602	8489	10251

Table #3. Catch per Unit Effort per Sub-area and Division.

Sub Area	Div.	Catch/D.F.				Catch/H.F.			
		1982	1983	1984	1985	1982	1983	1984	1985
3	M	25.3	10.4	14.1	22.4	3.4	1	1.4	2.8
3	N	26.8	12.8	14.7	14.4	3.9	1.8	2	1.8
3	O	20.7	25	22.3	15	4.1	2.9	2.2	1.3
4	4W	24.3	20.6	30.8	31.1	2.3	1.6	2.7	2.4

Table #4. Nominal catch per species for sub-area 3, 1982-1985

	1982		1983		1984		1985	
	M.T.	%	M.T.	%	M.T.	%	M.T.	%
Atlantic cod	3	0	1	0	16	.3	135	2.6
Haddock	---	---	4	.1	7	.1	12	.2
Atlantic Redfishes	6125	99.7	6154	98.9	5198	98.9	4692	91.6
Silver Hake	1	0	---	---	---	---	44	.9
Red Hake	0	0	1	0	2	0	24	.6
Pollock	1	0	---	---	---	---	4	.1
American Plaice	---	---	---	---	11	.2	30	.6
Witch Flounder	---	---	---	---	---	---	31	.6
Yellowtail Flounder	---	---	---	---	11	.2	12	.3
Atlantic Halibut	1	0	---	---	4	.1	26	.5
Flatfishes Nei	0	0	53	.8	---	---	28	.6
White Hake	---	---	---	---	---	---	7	.1
Ground Fishes Nei	0	0	13	.2	8	.2	12	.2
Atlantic Mackerel	---	---	---	---	---	---	1	0
Argentines	1	0	---	---	1	0	33	.7
Capelin	---	---	---	---	---	---	3	0
Skates Nei	---	---	6	.1	---	---	26	.5
Pelagic Fishes Nei	20	.3	---	---	---	---	---	---
<b>Total</b>	<b>6152</b>	<b>100</b>	<b>6232</b>	<b>100</b>	<b>5258</b>	<b>100</b>	<b>5120</b>	<b>100</b>

Table #5. Catch per Division, Sub-area 3, 1982-1985

Year	3M		3N		3O		Total	
	M.T.	%	M.T.	%	M.T.	%	M.T.	%
1982	1870	30.4	2629	42.7	1653	26.9	6152	100
1983	2324	37.3	2408	38.6	1500	24.1	6232	100
1984	1567	29.8	2373	45.1	1318	25.1	5258	100
1985	1840	35.9	2168	42.3	1112	21.8	5120	100

Table #6. Nominal catch per species for sub-area 4, 1982-1985

	1982		1983		1984		1985	
	M.T.	%	M.T.	%	M.T.	%	M.T.	%
Atlantic cod	33	.3	59	.7	24	1.5	1	0
Haddock	41	.3	126	1.5	229	1.5	79	.4
Atlantic Redfishes	17	.1	20	.2	11	.1	93	.5
Silver Hake	11969	96.4	7418	86.7	14496	94	17683	96
Red Hake	93	.8	188	2.2	106	.7	68	.4
Pollock	84	.7	261	3	123	.8	66	.3
American Plaice	---	---	7	.1	9	.1	31	.3
Witch Flounder	2	0	---	---	---	---	3	0
Yellowtail Flounder	2	0	---	---	3	0	6	.1
Atlantic Halibut	---	---	5	.1	---	---	14	.1
Flatfishes Nei	3	0	16	.2	---	---	6	0
American Angler	---	---	---	---	---	---	15	.1
Cusk	---	---	---	---	---	---	24	.1
White Hake	---	---	---	---	---	---	2	0
Wolfishes	---	---	---	---	---	---	3	0
Ground Fishes Nei	22	.2	60	.7	42	.1	2	0
Atlantic Herring	1	0	---	---	---	---	6	.1
Atlantic Mackerel	---	---	1	0	32	.1	130	.7
Argentines	53	.4	364	4.3	151	1	144	.8
Skates Nei	---	---	18	.2	---	---	5	0
Short-Finned Squid	93	.8	3	0	34	.1	8	.1
Dogfish Sharks Nei	---	---	8	.1	---	---	---	---
Summer Flounder	---	---	---	---	3	0	---	---
<b>Total</b>	<b>12413</b>	<b>100</b>	<b>8554</b>	<b>100</b>	<b>15263</b>	<b>100</b>	<b>18389</b>	<b>100</b>

Table #7 Length Composition Samples in Silver Hake (*Merluccius bilinearis*) Fisheries, Division 4W, 1965.

	Males				Total
	April	May	June	July	
No. of Samples	37	39	22	4	102
No. of Individuals	15334	15333	8053	2299	41279
Sample Weight (Kg)	3300	2523	1556	441	7820
Mean Weight (Kg)	.212	.164	.193	.192	.189
Mean Total Length (cm)	29.3	28.6	28.9	28.4	28.9
Standard Deviation (s) (+/-)	2.2656	2.8349	2.0542	1.8264	2.4224
% (In Numbers)	58.4	62.7	68.5	74.1	62.5
% (In Weight)	55.2	59.9	61.2	71.2	58.6
Females					
No. of Samples	37	39	22	4	102
No. of Individuals	11123	9104	3702	803	24732
Sample Weight (Kg)	2680	1686	986	174	5526
Mean Weight (Kg)	.241	.185	.266	.217	.223
Mean Total Length (cm)	30.6	29.8	31.2	31	30.4
Standard Deviation (s) (+/-)	3.3235	4.0652	4.1302	2.3548	3.5548
% (In Numbers)	41.6	37.3	31.5	25.9	37.5
% (In Weight)	44.8	40.1	38.8	28.3	41.4
Total					
No. of Samples	37	39	22	4	102
No. of Individuals	26717	24437	11755	3102	66011
Sample Weight (Kg)	5980	4209	2542	615	13346
Mean Weight (Kg)	.224	.172	.216	.198	.202
Mean Total Length (cm)	29.8	29	29.6	29.1	29.5
Standard Deviation (s) (+/-)	2.8570	3.3934	2.5061	2.2844	2.9837
% (In Numbers)	100	100	100	100	100
% (In Weight)	100	100	100	100	100

LENGTH FREQUENCIES REPORTED BY THE FLOTA CUBANA DE PESCA

Table #8

Species: Silver Hake		Region: Northwest Atlantic Ocean		Division: AW		Gear: Bottom										
Exploratory or commercial fishing: Commercial		Catches or landings:		Catches		Mesh size: 50 mm										
Method of measuring fish		Lengths:		Total		To the nearest cm		Reported by: R. Dominguez								
Length group		01-07/04/85 (1)		08-14/04/85 (2)		15-21/04/85 (3)		22-28/04/85 (4)		April/85						
1cm	2cm	1	2	1	2	1	2	1	2	1	2	total	total	NOTE:		
13																
14																
15																
16		1												1		
17		0												4		
18		3												10		
19		3												38		
20		0												74		
21		1												108		
22		0												118		
23		0												96		
24		2												61		
25		12												40		
26		67												21		
27		160												70		
28		297												124		
29		391												433		
30		485												185		
31		410												466		
32		233												1122		
33		121												804		
34		65												2125		
35		18												3192		
36		1												1014		
37		1												4251		
38		0												4573		
39		0												2805		
40		0												1781		
41		0												875		
42		0												459		
43		1												222		
44		1												198		
45		0												111		
46		2												66		
47		0												44		
48		0												30		
49		0												21		
50		0												17		
51		0												15		
52		1												10		
TOTAL		2273	1972	4245	3378	3059	6437	3398	2462	5860	6545	3630	10175	15594	11123	26717
No. of samples		12			11			6				8			37	
Mean length (mm)		2273	1972	4245	3378	3059	6437	3398	2462	5860	6545	3630	10175	15594	11123	26717
Standard dev. +/-		28.9	30.5	29.6	28.7	29.8	29.3	29.9	31.5	30.6	29.4	30.7	29.9	29.3	30.6	29.8
Mean weight (g)		.198	.238	.217	.194	.221	.207	.234	.253	.242	.203	.252	.227	.212	.241	.224
Depth range (m)		160-340			240-330			170-295			175-315			160-340		

Table #9  
LENGTH FREQUENCIES REPORTED BY THE FLOTA CUBANA DE PESCA

Species: Silver hake		Region: Northwest Atlantic Ocean		Divisions: 4W		Gear: Bottom	
Exploratory or commercial fishing: Commercial		Catches or landings: Catches		Mesh size: 50 mm		Method of measuring fish: Length: Total	
Reported by: R. Dominguez		To the nearest cm		20-26/05/85 (8)		27-31/05/85 (9)	
Length group		06-12/05/85 (5)		13-19/05/85 (7)		20-26/05/85 (8)	
1cm	2cm	1	2	1	2	1	2
total	total	total	total	total	total	total	total
13				1		1	
14				1		1	
15				0		0	
16				0		0	
17				1		4	
18				2		6	
19				6		26	
20				22		42	
21				30		27	
22				50		42	
23				70		27	
24				88		56	
25				82		56	
26				91		60	
27				96		46	
28				30		35	
29				30		35	
30				60		16	
31				87		32	
32				70		86	
33				163		117	
34				143		86	
35				61		31	
36				206		258	
37				116		83	
38				461		403	
39				622		521	
40				413		483	
41				280		150	
42				693		633	
43				441		483	
44				234		150	
45				675		533	
46				894		772	
47				753		770	
48				847		603	
49				549		169	
50				806		119	
51				819		651	
52				717		489	
53				299		1016	
54				702		540	
55				433		494	
56				333		262	
57				175		376	
58				349		246	
59				524		180	
60				324		240	
61				155		80	
62				123		24	
63				8		165	
64				43		52	
65				51		9	
66				29		33	
67				28		26	
68				17		3	
69				3		23	
70				10		2	
71				10		24	
72				14		15	
73				6		6	
74				6		16	
75				0		14	
76				1		7	
77				3		6	
78				3		7	
79				4		7	
80				4		8	
81				5		5	
82				2		2	
83				2		2	
84				2		1	
85				2		5	
86				2		1	
87				3		2	
88				3		1	
89				1		1	
90				1		1	
91				1		1	
92				1		1	
93				1		1	
94				1		1	
95				1		1	
96				1		1	
97				1		1	
98				1		1	
99				1		1	
100				1		1	
101				1		1	
102				1		1	
103				1		1	
104				1		1	
105				1		1	
106				1		1	
107				1		1	
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124				1		1	
125				1		1	
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232				1		1	
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263				1		1	
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265				1		1	
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267				1		1	
268				1		1	
269				1		1	
270				1		1	
271				1		1	
272				1		1	
273				1		1	
274				1		1	

Table #10

LENGTH FREQUENCIES REPORTED BY THE FLOTA CUBANA DE PESCA

Species: Silver Hake		Region: Northwest Atlantic Ocean		Division: 4W		Gear: Bottom									
Exploratory or commercial fishing: Commercial		Catches or landings:		Catches		Mesh size: 50 mm									
Method of measuring fish: Length:		Total		To the nearest cm		Reported by: R. Dominguez									
Length group		17-23/06/85 (10)		24-30/06/85 (12)		Junio/85									
1cm	2cm	1	2	1	2	1	2	total	1	2	total	1	2	total	NOTE:
13															1
14															2
15															M
16															F
17															E
18		3	1									3	1	4	M
19		5	1									5	1	6	A
20		8	1									8	1	9	L
21		5	4									5	4	9	M
22		14	6									14	6	20	A
23		15	8									15	8	23	L
24		48	6									48	6	54	M
25		143	16									143	16	159	A
26		299	45									299	45	344	L
27		566	55									566	55	621	M
28		782	90									782	90	872	A
29		698	140									698	140	838	L
30		556	226									556	226	782	M
31		291	250									291	250	541	A
32		123	339									123	339	462	L
33		29	350									29	350	379	M
34		12	318									12	318	330	A
35		6	88									6	88	94	L
36		11	36									11	36	47	M
37		2	22									2	22	24	A
38		3	11									3	11	14	L
39		5	10									5	10	15	M
40		3	5									3	5	8	A
41		1	3									1	3	4	L
42		0	1									0	1	1	M
43		2	0									2	0	2	A
44															L
45															M
46															A
47															L
48															M
49															A
50															L
51															M
52															A
TOTAL		3625	2034	5659	1348	466	1814	3080	1202	4282	8053	3702	11755		
No. of samples			11			3			8			14			
No. of fish meas.		3625	2034	5659	1348	466	1814	3080	1202	4282	8053	3702	11755		
Mean length (mm)		29.4	31.7	30.2	28.4	31.2	29.1	28.5	30.3	29	28.9	31.2	29.6		
Standard dev. +/-		.221	.261	.235	.161	.264	.187	.175	.276	.203	.193	.266	.216		
Mean weight (g)															
Depth range (m)			140-330			140-180			115-135			115-330			

Table #11

LENGTH FREQUENCIES REPORTED BY THE FLOTA CUBANA DE PESCA

Species: Silver Hake		Region: Northwest Atlantic Ocean		Division: 4W		Gear: Bottom	
Exploratory or commercial fishing: Commercial		Catches or landings:		Catches		Mesh size: 60 mm	
Method of measuring fish: Lengths		Total		To the nearest cm		Reported by: R. Dominguez	
Length group: 01-07/07/83 (13)							
1cm	.5cm	1	2	total	1	2	total
13							
14							
15							
16							
17							
18							
19							
20							
21							
22							
23		1		1			
24		7		7			
25		50		51			
26		332	14	346			
27		457	31	488			
28		340	61	401			
29		485	110	595			
30		293	109	402			
31		235	171	406			
32		72	104	176			
33		24	108	132			
34		2	38	40			
35		1	35	36			
36			5	5			
37			8	8			
38			1	1			
39			0	0			
40			7	7			
41							
42							
43							
44							
45							
46							
47							
48							
49							
50							
51							
52							
TOTAL		2299	803	3102			

NOTE:  
1 = FEMALE  
2 = FEMALE

No. of samples: 4  
No. of fish meas.: 2299; 803; 3102  
Mean length (mm): 28.4; 31; 29.1  
Standard dev. +/-: 1.826; 2.354; 2.2844  
Mean weight (g): .192; .217; .198  
Depth range (m): 110-220





FIG. #1 Mean total length  
Silver hake (1+2).

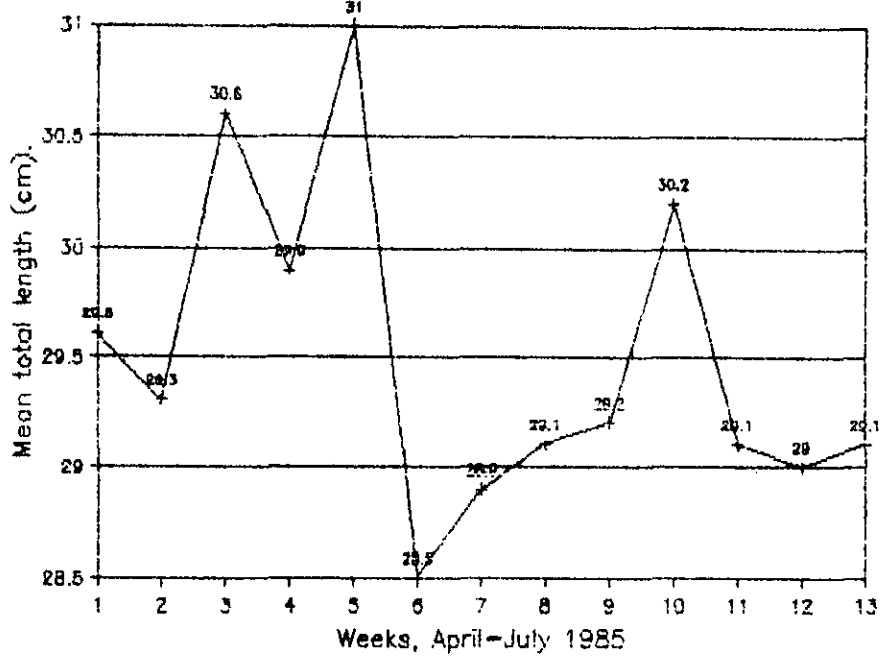


FIG. #2 Mean total length  
Silver hake (1&2)

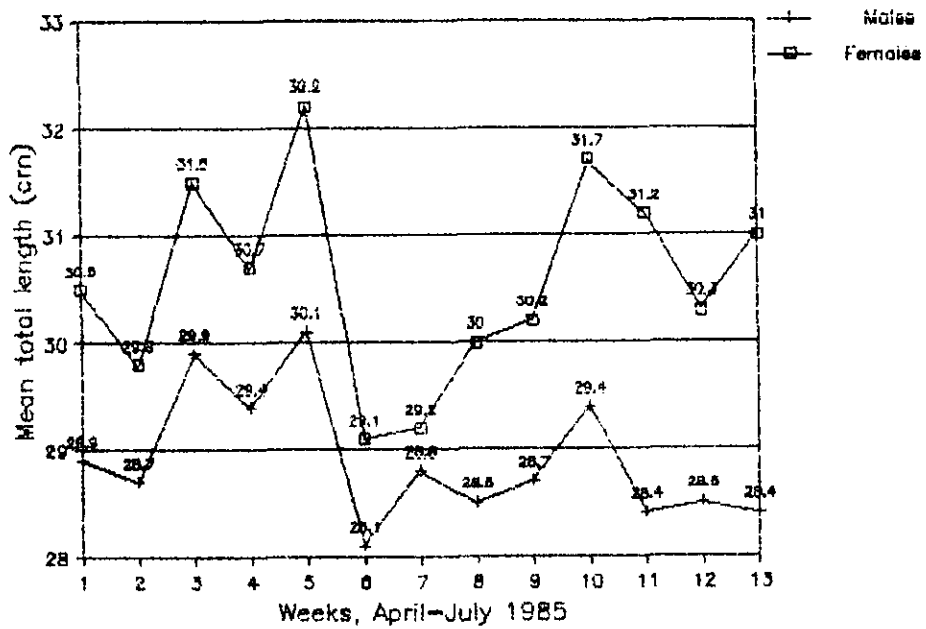


FIG. #3 Sex composition by numbers  
Silver hake

