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Fourteen trawlers and 138 pair trawlers (these vessels represent 69 gears) operated in the ICNAF Area during 1970. Total catch was 276,006 tons (97% cod, 2.4% haddock and 0.6% other species (white hake and pollock)). Total tonnage of the fleet was 83,605 tons and 4,053 fishermen made the crew.

Table 1. Total nominal catch by Spanish trawlers, 1969 and 1970, by subareas.

Subarea	1969			1970		
	Otter Trawlers	Pair Trawlers	Total	Otter Trawlers	Pair Trawlers	Total
1	1,856	21,925	23,781	1,303	17,502	18,805
2	33,148	4	33,152	10,469	214	10,683
3	31,367	142,038	173,405	18,493	150,030	168,523
4	3,636	44,472	48,108	18,524	51,311	69,835
5	-	15,526	15,526	-	8,162	8,162
Total	70,007	223,965	293,972	48,789	227,218	276,007

Samples of cod were taken from the M/T Bochorno in Subareas 2, 3 and 4, only during July-December period. Length, sex and age (by otolith reading) was recorded. No studies were carried out in Subareas 1 and 5, and no other species than cod.

## Subarea 1

A. Status of the Fisheries

Main fishing was carried out by pair trawlers in Div.1D, 1B and 1A (1D 10,943 tons of cod). Single trawler catches (otter and stern trawlers) were negligible - 8%. Total catch decreased from 1969 in 5,776 tons.

## Subarea 2

Total catch has decreased from 33,152 in 1969 to 10,862 tons in 1970. Table 2 gives the rate of decrease in the 1960's. Catches of pair trawlers increased from 4.5 to 213.6 tons. Catches were mainly in Div.2J.

Table 2. Cod catches (metric tons) in Subarea 2.

	<u>Trawlers</u>	<u>Pair Trawlers</u>	<u>Total</u>
1964	45,285	-	45,285
1965	59,481	-	59,481
1966	48,071	550	48,621
1967	36,815	142	36,957
1968	32,575	278	32,853
1969	33,148	4	33,152
1970	10,469	214	10,683

B. Special Research Studies

Cod

Samples in July-August and October (6,053 cod measured and 308 age and sex determinations) show that in the last quarter great numbers of 3-year-old cod entered the fishery. The most important age-group in the catch is the 5-year-old cod (1965 year-class), as in recent past years.

The average length was 47.8 cm (53.3 in 1969) and the average age 5.27 years (ranges from 2 to 12) (5.7 in 1969).

Tables 3 and 4 give the length frequencies and age compositions.

Table 3. Length frequencies (in %.)

cm	Subarea 2 Quarters	
	III	IV
24-26	3	-
27-29	12	-
30-32	32	50
33-35	64	50
36-38	93	57
39-41	122	91
42-44	126	91
45-47	110	78
48-50	97	104
51-53	101	85
54-56	86	91
57-59	57	79
60-62	38	80
63-65	21	55
66-68	17	47
69-71	12	24
72-74	6	7
75-77	1	6
78-80	1	2
....		
90-92	-	1
<b>Total</b>	<b>999</b>	<b>998</b>

Table 4. Age composition (in %.)

Year-class	Subarea 2 Quarters		
	Age	III	IV
1967	3	39	247
1966	4	143	196
1965	5	359	266
1964	6	240	241
1963	7	146	28
1962	8	48	7
1961	9	18	9
1960	10	5	-
1959	11	-	-
1958	12	1	1
<b>Total</b>		<b>999</b>	<b>996</b>

Sex ratios (calculated directly from age samples) are grouped each two months and for immature or mature cod (more or less than 53.5 cm). A very high significant deviation from the 50% ratio is observed in cod from July-August greater than 53.5 cm. These data suggest sex segregation in summer and autumn, greater in mature cod (greater than 53.5 cm).

Table 5. Sex ratios, Subarea 2.

Cod	Sex	July-August		September-October	
		No	%	No	%
< 53.5 cm	Male	90	34	43	38
	Female	175	66	71	62
	Total	265	100	114	100
> 53.5 cm	Male	26	18	26	29
	Female	120	82	64	71
	Total	146	100	90	100

Subarea 3

A. Status of the Fisheries

For pair trawlers this subarea had the major fishing activity with an increase of catches (7,992 tons more). Catches of trawls (with a decrease of 50% from 1969) suggest that activity of the pair trawlers were higher than in the past. Division 3L and 30 provided 58% of the whole catch from this subarea. Divisions 3L, 30, 3Ps, provided 3,108 tons of haddock, 582 of pollock and 303 of white hake.

B. Special Research Studies

Cod

Samples from Div. 3L and 3K were made. 5,045 cod measured and 261 ages and sex determinations. Mean length 49.4 cm (56.0 in 1969) and mean age of 4.81 (5.9 in 1969). Predominant year-classes were 1965 and 1966. Modal class 1966. A high deviation of 50% ratio in segregation of sexes can be observed in cod greater than 53.5 cm in July-August. Samples from October-November do not reveal any significant sex-ratio deviations (Table 8).

Tables 6 and 7 show length and age composition in this subarea.

Table 6. Length composition (in %.)

Table 7. Age composition (in %.)

Subarea 3 Quarters			Subarea 3 Quarters			
cm	III	IV	Year-class	Age	III	IV
21-23	4	-	1968	2	40	24
24-26	11	-	1967	3	65	160
27-29	24	-	1966	4	349	210
30-32	48	-	1965	5	206	366
33-35	57	24	1964	6	138	158
36-38	81	32	1963	7	120	22
39-41	96	42	1962	8	23	15
42-44	96	76	1961	9	10	-
45-47	89	94	1960	10	6	-
48-50	93	113	1959	11	2	-
51-53	81	113	1958	12	1	-
54-56	88	161				
57-59	79	126	Total		960	955
60-62	49	108				
63-65	34	58				
66-68	24	30				
69-71	23	10				
72-74	10	8				
75-77	7	-				
78-80	5	2				
81-83	-	-				
84-86	-	2				
87-89	-	-				
90-92	-	-				
93-95	-	-				
96-98	-	1				
Total	999	1000				

Table 8. Sex ratios, Subarea 3

Cod	Sex	July-August		September-October	
		No	%	No	%
< 53.5 cm	Male	85	42	11	35
	Female	118	58	20	65
	Total	203	100	31	100
> 53.5 cm	Male	39	28	20	47
	Female	96	72	23	53
	Total	135	100	43	100

Subarea 4

A. Status of the Fisheries

Total catch increased to 21,727 tons, mainly due to trawlers (3,636 tons in 1969, 18,524 tons in 1970). Trawlers extended their fishing areas to Div.4S, 4T, 4W, and greater captures were at 4R, 4Vn, 4Vs. Pair trawler catches increase at Div.4Vn, 4Vs and 4W.

B. Special Research Studies

Samples from Div.4R only suggest a mode at 5-year-old cod (year-class 1965), with dominant classes 1963 to 1966. Recruitment in this subarea for 1963 and 1964 years was high, and this year-classes were dominant in 1970 catches (Tables 9 and 10).

Table 9. Length composition (in %.)

cm	Subarea 4 Quarters	
	III	IV
30-32	18	1
33-35	29	5
36-38	65	13
39-41	99	33
42-44	96	61
45-47	135	85
48-50	130	118
51-53	106	128
54-56	90	122
57-59	82	120
60-62	64	99
63-65	30	93
66-68	16	51
69-71	17	25
72-74	18	24
75-77	5	17
78-80	-	3
81-83	-	1
Total	1000	999

Table 10. Age composition (in %.)

Year-class	Age	Subarea 4 Quarters	
		III	IV
1967	3	-	5
1966	4	271	134
1965	5	306	372
1964	6	245	291
1963	7	33	113
1962	8	47	38
1961	9	22	21
1960	10	5	10
1959	11	-	-
1958	12	-	-
1957	13	-	-
1956	14	-	4
Total		929	998

4,126 cod were measured and 208 ages and sex determinations carried out. Mean length decreases from 56.0 for 1969 to 47.7 in 1970, and also mean age: from 5.9 years to 4.9 in 1970.

Sex ratios during summer and autumn do not reveal any significant deviation from 50% rates (Table 11).

Table 11. Sex ratios, Subarea 4.

<u>Cod</u>	<u>Sex</u>	<u>July-August</u>		<u>September-October</u>	
		<u>No</u>	<u>%</u>	<u>No</u>	<u>%</u>
< 53.5 cm	Male	29	64	47	59
	Female	16	36	33	41
	Total	45	100	80	100
> 53.5 cm	Male	17	44	52	46
	Female	22	56	62	54
	Total	39	100	114	100

Other species were haddock 2,604 tons, pollock, 526 tons and white hake 76 tons, mainly caught at 4W and 4Vs divisions.

Subarea 5

A. Status of the Fisheries

A decrease of total catch is observed, mainly in Subdivision 5Ze. Only pair trawlers had exploited this area, with poor results.

General pattern, according to Spanish sampling data, reveals in the status of the fisheries a decrease of catches (except in Subarea 4) and a diminution of more or less 1 year in the predominant year-class cod caught.

Haddock. Total catch in 1970 by subareas (metric tons).

Subarea 1	6
Subarea 3	3,109
Subarea 4	2,604
Subarea 5	845