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Portuguese Research Report 1973

by

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The present report summarizes the Portuguese research carried out on cod from gill nets boats, as well as some statistical data concerning the catches by the whole Portuguese cod fishery in I.C.N.A.F. Area.

I. Statistical informations

The total cod catches landed during 1973 concerning the ICNAF Area was 124,326 metric tons (Table 1). This value was smaller than the correspondent one to 1972 (129,705 metric tons). The main fishery was made by trawlers (97,868 metric tons) while the insignificant dory vessels fleet landed only 8,106 metric tons. The gill nets catches, 18,352 metric tons, were a little smaller than in the previous year (19,968 metric tons).

The total catches by the Portuguese cod fishery fleet in the ICNAF AREA, and by the differents gears as well as by subareas are presented in Table 1.

Table 1

Total of cod landed from Portuguese cod fishery. ICNAF AREA - 1973

Subareas	Trawl			Dory vessel	Gill nets	TOTAL
	Side	Stern	Total			
1		7	7	6	8,318	3,331
2	7,873	5,406	13,279	18,352		13,279
3	43,600	24,990	68,590	7,911	10,033	86,534
4	10,053	5,939	15,992	18	1	16,182
1-2-3-4	61,526	36,342	97,868	8,106	18,352	124,326

The next table (Table 2), presents the catches by trawlers (side and stern), gill nets and dory vessels in the divisions concerning the subareas where the fishery occurred (subareas 1, 2, 3 and 4).

Concerning this table we must point out:

- a) The best catch with all gears occurred in subarea 3 (86,534 metric tons). The smaller was in subarea 1, with 8,331 metric tons.
- b) The fishery fleet only visited the subarea 2 with trawlers and the catches was not very important, 13,279 metric tons.
- c) The trawlers fished mainly in subarea 3 and in this region the total obtained was 68,590 metric tons (43,600 metric tons from side trawl and 24,990 m.t. from stern ones).
- d) The gill net captures were made only in subareas 3 and 1 with 10,033 m.t. and 8,318 m.t. respectively (a insignificant catch of 1 m.t. in subarea 4 is not for consideration).
- e) The total catch by trawlers tables 1, 2, and 3, was 97,868 m.t. (61,526 m.t. from side trawl and 36,342 m.t. from stern trawl) against 18,352 m.t. landed from gill net boats and only 8,106 m.t. from line fishery.

The table 3 presents the Portuguese cod catch and effort by trawlers, side and stern trawl, by months, and along the different subareas where the fishery occurred. It is evident on it that the main catch was made in subarea 3 - 68,590 m.t. and with more or less 50% fished during the second quarter - 33,481 m.t. . It was, in fact this subarea the much more visited by the trawlers and we can point out also that in the same region the fleet fished all over the year. The same fact happened also in the subarea 2 with catches not so importants - only 13,279 m.t. with 4,007 m.t. obtained during the second quarter of the year and 1,406 m.t. from the third one.

The subarea 4 was also visited by trawlers but only during the first quarter of the year; the catches were, from side trawl 10,053 m.t. and by stern one 5,939 m.t. .

Relatively the quarters of the year and subareas visited by trawlers we must point out that the best catch occurred in the second quarter of the year, 37,488 m.t. and the poorest in the third one - 12,780 m.t. .

The table 3 shows also the catches and efforts by months as well as the totals by subareas quarterly.

The table 4 presents the cod catches and efforts by the gill net fleet. The total catch from this gear was 18,352 m.t. fished in subareas 1 and 3 - 8,318 m.t. and 10,033 m.t. respectively. The same table presents also all the catches, by this gear, monthly and quarterly.

The table 5 presents the catches and efforts ^{by} dory vessels. The amount of cod fished with this gear, in subareas 1, 3 and 4 was only 8,106 m.t. which are only about 7% of the total Portuguese cod catches in the ICGAF area. The same table shows the catches by months and quarterly. The catch in subarea 1 was insignificant (only 6 m.t.); the best catch occurred in subarea 3-7,911 metric tons (2,614 m.t. from the second quarter of the year and 5,229 m.t. from the third one).

Relatively to the catch from 1972 we can point out the following points:

- i) In 1973 the total catch was a little lower than in the previous year (124,326 m.t. in 1973 against 129,705 m.t. in 1972)
- ii) The decrease of more or less 5,000 tons in 1973, concerns to all gears which were, each one of them, lower than in 1972 (see Portuguese Research Report, 1972).

- iii) In spite of total trawl catch presents a decrease of about 2,000 tons we can point out an increasing on the catches from stern trawlers (33,981 tons in 1972 fishery against 36,342 tons in 1973).
- iiii) The catches concerning the subareas presented, more or less, the same values except the catches from subarea 4 which was higher - 12,871 tons in 1972 against 16,182 tons in 1973.

II. Special research studies

The present report, in addition to reviewing the status of fisheries presents also data on length, age maturity and informations about first maturity, obtained from random sampling on board commercial gill net vessel. Methods used for this study were the same as in previous years. Detailed information on length and age samples are included in the ICNAF sampling yearbook.

SUBAREA - 1

A) - Status of the fisheries

In this subarea only fished with significance the gill net fleet (as in previous year) with a total catch of 8,318 metric tons (tables 1, 2 and 4), the fishery took place in Divisions 1B, 1C and 1D (table 2) during June (3,377 tons), July (4,445 tons) and August (496 tons - table 4).

B) - Research studies

Samples for biological study were collected from Division 1B 1C and 1D between 9 June and 16 July as follows

Div.	Samples	Date	Depth (m)	Fish lengths (No)	Fish aged (No)
1 B	A	9-16 July	57-165	2,338	
1 C	B	30 June	201	100	
1 C	C	1-4 July	201	1,688	
1 D	D	9-27 July	201-282	3,599	500

a) Length composition

Lengths ^{ranged} from 44cm to 119cm (30cm classes); mean length were:

82.9 cm in sample A - July 1 B.
81.3 cm in sample B - June 1 C
83.5 cm in sample C - July 1 C
81.3 cm in sample D - June 1 D

The next table presents the distribution on lengths per mile in division 1 B, 1 C, and 1 D.

Lengths per mile				
Lengths (3cm classes)	1 B	1 C		1 D
	July	June	July	June
44				2
47				5
50				10
53	1			5
56	1			7
59	1		1	6
62	4		1	18
65	8	10	7	26
68	28	20	10	43
71	68	40	56	77
74	80	120	98	116
77	102	210	136	147
80	150	140	145	155
83	116	120	103	118
86	114	160	105	87
89	97	30	71	61
92	67	30	83	40
95	60	50	58	29
98	47		63	21
101	21	20	28	12
104	21	20	30	6
107	7	30	10	6
110	6		2	3
113	3		2	
116			1	
119			1	
122				
125				
128				
131				
134				
137				
140				
143				
146				
149				
	1002	1000	1001	1000

b) Age composition

Ages ranged from 5 to 17 years old, with a significant dominance of the ages 8 and 7 in the month sampled - June - - sample D. The mean age in this month was 8.4 years old.

c) Growth

Average length (cm) at age of cod caught by gill nets, sampled during the month of June are shown in table below.

Division 1D - June

Year class	Age-group	Mean length (cm)	N ^o of fish
1968	V	55	10
1967	VI	67	42
1966	VII	77	149
1965	VIII	83	170
1964	IX	83	37
1963	X	87	20
1962	XI	89	9
1961	XII	94	29
1960	XIII	95	11
1959	XIV	93	6
1958	XV	97	4
1957	XVI	103	1
1956	XVII	97	1

d) Stage of maturity

The study of stages of maturity presented, in males and females, a high percentage of fishes in post-spawning stage, 54.5% and 51.2% respectively; the spawning stage it was also observed in males and females but in a smaller percentage, 37.2% in the females and 18.5% in males.

The others stages were also detected but not in so high percentage.

e) Age at first maturity

During the study of the age we prosecuted trying the identification of maturity rings in the otoliths. In spite of the high percentage of the otoliths didn't allowed us to achieve good conclusions, some of them presented maturity rings mainly after the 6, 7 and 8 years old.

Subarea 2

In this subarea, like in the last two years, only operated the trawl fleet with a total catch of 13,279 metric tons (7,873 tons from side trawl and 5,406 tons from stern one) - tables 1, 2 and 3.

The trawlers only fished in division 2 J over all quarters of the year. Wherever the best catch occurred during the second quarter of the year with 4,007 m.t. (2,608 m.t. from side trawl and 1,399 m.t. from stern one) - table 3.

Subarea 3

In this subarea operated not only the trawlers but also the gill nets vessels and dory vessels, the total fished on cod in this subarea for all the fleet was 86,534 m.t., divided as follows:

68,590	tons from	trawlers
10,033	tons from	gill nets
7,911	tons from	dory vessels (table 1)

Table 2 presents cod catches and efforts by all kinds of vessels in this subarea and in the tables 3, 4 and 5 the same values are referred by months and quarters of the year.

Table 2 presents yet the catches by divisions as well as by gears.

We can point out that the divisions visited were:

for trawlers 3 K, 3 L, 3 M, 3 N, 3 O and 3 PN

for dory vessels and gill nets 3 L, 3 N, 3 O, 3 PN and 3 PS

Concerning the catches in this subarea we can point out the follow points relatively the differente divisions:

- a) the highest catch by trawlers ocouredⁱⁿ Division 3 L with 29,873 tons from which 19,544 tons belongs to the side trawl and 10,329 tons to stern one.
- b) The dory vessel fished also the higher value of cod in Division 3 L while the gill net fleet fished better in Division 3 O (5,267 tons).
- c) The smaller catch by trawlers ocoured in Division 3 N (93 tons, 72 tons from side trawl and 21 tons from stern one)
- d) The dory vessels fished the smaller tonnage of ood in Division 3 E (only 3 O tons) while the gill net's smaller fishery was in Division 3 PS with only one metric ton, followed by the 3 PN catch - 109 m.t..

The table 3 presents cod catch and efforts by the trawl fleet over all the months of the year and quaterly. We can see easily that the best fishery ocurred during the second quarter of the year - 33,481 tons from which 19,796 tons were from side trawl and 13,685 tons from stern one. We can see also that concerning the total landed from this subarea (68,590 tons) more than 50% belongs to side trawl (43,600 tons).

Relatively the subarea 3 and the the gill net fishery looks importants the following points:

- a) The total tonnage landed from this region was 10,033 tons (tables 1, 2 and 4)
- b) This gill net vessels only fished during the second third and fourth quarters of the year but only in the second and third with representatif landings - 5,707 tons from the second and 4,178 tons from the third one
- c) Monthly, the best catch ocurred in May with 4,875 m.t. landed (table 4).

Concerning the line fishery we can see, at the table 5, that these vessels fished, inside this subarea, in Divisions 3 L, 3 N, 3 O, 3 PN and 3 PS. The dory only fished during the second quarter (2,614 tons) and third (5,229 tons) - table:5.

B - Research studies

Samples for biological study were collected from Division 3 between 19 May and 28 September as follows:

Div.	Samples	Date	Depth (m)	Fish lengths	Fish aged
3 L	A	26-29 July	13-73	652	} 400
3 L	B	7-9 Sept.	13-46	200	
3 N	C	19-30 Aug.	55	3,111	} 450
3 N	D	1-28 Sept.	45-54	571	
3 O	E	19-24 May	96	2,012	50
3 O	F	1-16 Aug.	68-74	2,570	350

Division 3 L

a) Length composition

Lengths ranged from 49cm to 191cm (3cm classes). Mean lengths were 97.3 cm in July and 78.1cm in September, samples A and B respectively.

b) Age composition

Ages ranged from 5 years to 15 years old. Mean ages were: 10.6 in July and 9.0 in September.

c) Growth

Average length (cm) at age of cod caught by gill nets, sampled during the third quarter of the year are shown in the follow table:

<u>Division 3 L</u>				
Year-class	Age-group	Mean length		N° of fish
		July	September	
1968	V	67.0	67.0	1
1967	VI	64.1	57.9	17
1966	VII	69.1	64.7	19
1965	VIII	78.5	75.4	71
1964	IX	85.0	78.6	130
1963	X	90.6	83.9	75
1962	XI	97.3	86.4	39
1961	XII	99.9	88.8	24
1960	XIII	105.7	102.3	11
1959	XIV	107.8	100.3	6
1958	XV	105.6	102.9	6

d) Stage of maturity

The observations on stage of maturity gave us for males and females a very high percentage of fishes in the spawning stage in July and September. In percentage observed for males and females concerning all the stages were for both months:

<u>Stages</u>	<u>Percentages</u>			
	Males		Females	
	July	September	July	September
Developing	10	25	1	5
Spawning	54	38	61	53
Resting or recovering	2	7	13	14
Post spawning	34	30	25	28

One can observe that also the stages post-spawning and developing were quite well observed in males and females.

e) Age at first maturity

We observed also in otoliths from this subarea some exemplars with rings that we classified of maturity rings; in some cases, not very numerous, we studied some otoliths where we suspected the age of first maturity at 6 and 7 years old.

Division 3 N

a) Length composition

Length ranged from 58 to 148cm in August and from 55cm to 133cm in September.
Mean lengths were in August 92.8cm and 97.1cm in September.

b) Age composition

Ages ranged from 5 to 20 years old, with a predominance of ages 9, 8, 10 and 7. Mean ages were: 9.3 in August and 9.7 in September.

c) Growth

Average length (cm) at age of cod caught by gill nets, and sampled during the third quarter of the year (August and September) are shown in the table below:

<u>Division 3 N</u>				
Year-class	Age-group	Mean length		N° of fish
		August	September	
1968	V	68.4	64.7	5
1967	VI	70.8	78.5	12
1966	VII	78.2	83.4	65
1965	VIII	84.6	88.1	88
1964	IX	90.7	93.0	127
1963	X	100.5	100.8	73
1962	XI	108.0	106.7	31
1961	XII	111.2	110.8	15
1960	XIII	114.8	112.8	12
1959	XIV	116.1	113.4	11
1958	XV	111.8	111.7	2
1957	XVI	119.1	118.4	4
1956	XVII	121.9	121.7	3
1955	XVIII	-	-	-
1954	XIX	136.0	-	1
1953	XX	124.0	124.0	1

d) Stage of maturity

The observations concerning the stage of maturity are presented in the table below; one can see that the stages well represented were the spawning one in the females (August and September) and the post-spawning in the males (both months)

<u>Stages</u>	<u>Percentages</u>			
	<u>Males</u>		<u>Females</u>	
	<u>August</u>	<u>September</u>	<u>August</u>	<u>September</u>
Developing	8.7	12.5	1	1
Spawning	23.9	23.8	51	63
Resting or recovering	5.8	18.7	7	1
Post-spawning	61.7	45.0	41	35

e) Age at first maturity

During the age reading it was possible to observe some otoliths presenting some "mature rings" mainly after the 6, 7 and 8 years old.

In certain case we suspect to age at first maturity the age at 6 and 7 years.

Division 3 0

a) Length composition

Length for biological composition were ranged from 58cm to 142cm, 3cm classes, concerning samples collected during August. Mean length was 94.6cm (sample F).

b) Age composition

Ages ranged from 6 to 20 years old with a predominance of ages 9, 8, 10 and 7. Mean age was 9.3 years.

c) Growth

Average length (cm) at age of each caught by gill nets, sampled during August are shown in the follow table:

<u>Division 3 0 - August</u>			
<u>Year-class</u>	<u>Age-group</u>	<u>Mean length (cm)</u>	<u>Nº of fish</u>
1967	VI	71.4	7
1966	VII	77.9	50
1965	VIII	86.6	83
1964	IX	94.7	109
1963	X	98.3	52
1962	XI	106.5	19
1961	XII	107.9	14
1960	XIII	112.8	10
1959	XIV	117.8	3
1958	XV	112.0	1
1957	XVI	-	-
1956	XVII	-	-
1955	XVIII	91.0	1
1954	XIX	-	-
1953	XX	142.0	1

d) Stage of maturity

The observation of the stages of maturity in the fishes sampled, showed that even in males or females the stage better represented it was the spawning one (55.7% in the females and 49.5% in males).

The other stage with a good representation in this sample was the post-spawning (35.4% in the females and 39.6% in the males).

The other stage was present in very low percentages and the developing one it was absent in females.

e) Age at first maturity

As in the others samples it was possible to observe in some otoliths maturity rings after the ages 6, 7 and 8. In some cases we presume the age at first maturity at 7 years old (very low percentage).

The next table presents the distribution on lengths, per mille, in division 3 L, 3 N and 3 O.:

Lengths per mile						
Lengths (3cm classes)	3 L		3 N		3 O	
	July	September	August	September	May	August
44					1	
47					2	
50		15			5	
53		10			2	
56	3	5		2	3	
59		25	1		5	
62		20	2		4	
65	2	40	9		1	1
68	12	35	16		7	4
71	23	65	32		10	9
74	23	115	46	18	6	26
77	34	120	68	14	15	45
80	63	140	70	53	26	58
83	71	180	71	49	42	75
86	75	70	69	58	65	70
89	97	40	68	91	88	90
92	100	50	76	70	76	77
95	89	20	67	114	103	93
98	86	15	64	88	79	87
101	40	10	44	81	66	69
104	63		56	112	67	72
107	58	10	51	56	62	56
110	51	5	46	63	77	50
113	28	5	44	42	59	35
116	23		30	39	58	31
119	22		27	25	40	20
122	17	5	15	9	19	15
125	15		10	5	9	7
128	6		7	9	5	6
131	2		6	4	1	3
134			1	2	1	1
137			2		1	
140			1			
143	1,003	1,000	999	1,004	1,005	100

Subarea 4

A - Status of the fisheries

In this subarea fished the trawlers as well as the dory and gill net vessels (table 1). Wherever the main fishery concerns the trawl fleet with 15,992 m.t. of cod landed (10,053 from side trawlers and 5,939 tons from stern ones). The dory vessels catches were very poor, only 189 tons and the gill net one almost inexistant (only 1 m.t.).

Table 2 shows the divisions visited by the Portuguese cod fishery fleet and from it one can see that the main catch concerns the division 4 R; year the trawlers fished 11,232 m.t. of cod. Dory vessels on gill nets boats visited the division 4 VN with very poor results.

Table 3 shows the catches carried out in this subarea by months of the year and one can see that the fishery only occurred during the first quarter of the year. The best fishery occurred during the first month of the year with 12,050 tons of cod fished (8,267 tons from side trawl and 3,783 tons from stern one).

Table 5 presents the catches in this subarea made by dory vessels (only 189 tons) carried out during the second quarter of the year. In the same table we present also the respective fishing effort.

TABLE 2 - COD CATCH (metric Tons) AND EFFORT BY PORTUGUESE FLEET, BY ICNAF DIVISIONS - 1973

	DORY VESSEL		GILL NET		TRAWL				TOTAL TRAWL		TOTAL GENERAL
	Tons	Dory-hours	Tons	Hours out	SIDE	STERN	Tons	Hours Fishing	Tons	Hours Fishing	Tons
1 B	-	-	2,043	1,569	-	-	-	-	-	-	2,043
1 C	-	-	2,554	2,024	-	-	-	-	-	-	2,554
1 D	6	40	3,721	2,643	-	-	-	-	-	-	3,721
1 E	-	-	-	-	-	-	7	30	7	30	7
TOTAL	6	40	8,318	6,236	-	-	7	30	7	30	8,331
2 J	-	-	-	-	7,873	7,872	5,406	4,498	13,279	12,370	13,279
3 K					14,311	14,885	10,532	7,401	24,843	22,286	24,843
3 L	5,413	2,686	2,496	3,482	19,544	23,462	10,329	10,239	29,873	33,701	37,782
3 M	-	-	-	-	7,701	8,970	3,428	4,234	11,129	13,204	11,129
3 N	30	106	2,160	2,811	72	113	21	62	93	175	2,283
3 O	30	56	5,267	4,106	56	139	123	245	179	384	5,476
3 PN	1,405	836	109	165	1,916	2,099	411	400	2,327	2,499	3,841
3 ES	1,033	450	1	12	-	-	146	190	146	190	1,180
TOTAL	7,911	4,134	10,033	10,576	43,600	49,668	24,990	22,771	68,590	72,439	86,534
4 R					7,570	4,282	3,662	2,254	11,232	6,536	11,232
4 S					-	-	911	523	911	523	911
4 T					379	137	67	41	446	178	446
4 VN	189	124	1	10	1,868	2,359	686	874	2,554	3,233	2,744
4 VS					236	113	538	656	774	769	774
4 W					-	-	75	82	75	82	75
TOTAL	189	124	1	10	10,053	6,891	5,939	4,430	15,992	11,321	16,182
T O T A L	8,106	4,298	18,352	16,822	61,526	64,431	36,342	31,729	97,868	96,160	124,326

TABLE 3 - PORTUGUESE COD CATCH AND EFFORT - TRAWL FLEET - 1973

S U B A R E A S

		1		2		3		4		1 + 2 + 3 + 4	
		TONS	HOURS FISHING	TONS	HOURS FISHING	TONS	HOURS FISHING	TONS	HOURS FISHING	TONS	HOURS FISHING
JAN.	SIDE			13	15	336	206	8,267	4,308	8,616	4,529
	STERN			32	25	1,205	749	3,783	1,998	5,020	2,772
	TOTAL			45	40	1,541	955	12,050	6,306	13,636	7,301
FEB.	SIDE					3,308	2,975	595	595	3,903	3,570
	STERN					2,044	1,680	950	1,009	2,994	2,689
	TOTAL					5,352	4,655	1,545	1,604	6,897	6,259
MAR.	SIDE					2,678	3,916	1,191	1,988	3,869	5,904
	STERN			350	320	363	411	1,206	1,423	1,919	2,154
	TOTAL			350	320	3,041	4,327	2,397	3,411	5,788	8,058
1 st QUARTER	SIDE			13	15	6,322	7,097	10,053	6,891	16,388	14,003
	STERN			382	345	3,612	2,840	5,939	4,430	9,933	7,615
	TOTAL			395	360	9,934	9,937	15,992	11,321	26,321	21,618
APRIL	SIDE			173	135	8,961	5,548			9,134	5,683
	STERN					5,948	2,658			5,948	2,658
	TOTAL			173	135	14,909	8,206			15,082	8,341
MAY	SIDE			781	609	7,203	5,633			7,984	6,242
	STERN			821	505	5,431	3,448			6,252	3,953
	TOTAL			1,602	1,114	12,634	9,081			14,236	10,195
JUNE	SIDE			1,654	1,920	3,632	5,248			5,286	7,168
	STERN			578	610	2,306	2,760			2,884	3,370
	TOTAL			2,232	2,530	5,938	8,008			8,170	10,538
2 nd QUARTER	SIDE			2,608	2,664	19,796	16,429			22,404	19,093
	STERN			1,399	1,115	13,685	8,866			15,084	9,981
	TOTAL			4,007	3,779	33,481	25,295			37,488	29,074
JULY	SIDE			983	2,308	1,544	4,076			2,527	6,384
	STERN	7	32	265	598	532	1,541			804	2,171
	TOTAL	7	32	1,248	2,906	2,076	5,617			3,331	8,555
AUG.	SIDE			1	12	3,942	6,445			3,943	6,457
	STERN			101	151	931	1,676			1,032	1,827
	TOTAL			102	163	4,873	8,121			4,975	8,284
SEPT.	SIDE					2,837	5,172			2,837	5,172
	STERN			56	273	1,581	2,409			1,637	2,682
	TOTAL			56	273	4,418	7,581			4,474	7,854
3 rd QUARTER	SIDE			984	2,320	8,323	15,693			9,307	18,013
	STERN	7	32	422	1,022	3,044	5,626			3,473	6,680
	TOTAL	7	32	1,406	3,342	11,367	21,319			12,780	24,693
OCT.	SIDE			820	984	4,495	4,908			5,315	5,892
	STERN			431	493	3,027	3,104			3,458	3,597
	TOTAL			1,251	1,477	7,522	8,012			8,773	9,489
NOV.	SIDE			31	43	2,789	3,929			2,820	3,972
	STERN			457	368	1,209	1,820			1,666	2,188
	TOTAL			488	411	3,998	5,749			4,486	6,160
DEC.	SIDE			3,417	1,846	1,875	1,612			5,292	3,458
	STERN			2,315	1,155	413	515			2,728	1,670
	TOTAL			5,732	3,001	2,288	2,127			8,020	5,128
4 th QUARTER	SIDE			4,268	2,873	9,159	10,449			13,427	13,322
	STERN			3,203	2,016	4,649	5,439			7,852	7,455
	TOTAL			7,471	4,889	13,808	15,888			21,279	20,777
1973	SIDE			7,873	7,872	43,600	49,668	10,053	6,891	61,526	64,431
	STERN	7	32	5,406	4,498	24,990	22,771	5,939	4,430	36,342	31,731
	TOTAL	7	32	13,279	12,370	68,590	72,439	15,992	11,321	97,868	96,162

TABLE 4 - COD CATCH AND EFFORT BY PORTUGUESE GILL NET FLEET - 1973

S U B A R E A S								
MONTHS	1		3		4		1 + 3 + 4	
	TONS	HOURS OUT	TONS	HOURS OUT	TONS	HOURS OUT	TONS	HOURS OUT
APRIL			270	577	1	10	271	587
MAY			4,875	3,276			4,875	3,276
JUNE	3,377	2,203	562	496			3,939	2,699
2 nd QUARTER	3,377	2,203	5,707	4,349	1	10	9,085	6,562
JULY	4,445	3,337	84	190			4,529	3,527
AUG.	496	596	2,669	2,790			3,165	3,386
SEPT.			1,425	2,772			1,425	2,772
3 rd QUARTER	4,941	3,933	4,178	5,752			9,119	9,685
OCT.			148	475			148	475
NOV.								
DEC.								
4 th QUARTER			148	475			148	475
1973	8,318	6,136	10,033	10,576	1	10	18,352	16,722

TABLE 5 - COD CATCH AND EFFORT BY PORTUGUESE LINE FLEET (DORY VESSELS) - 1973

S U B A R E A S								
MONTHS	1		3		4		1 + 3 + 4	
	TONS	DORY HOURS	TONS	DORY HOURS	TONS	DORY HOURS	TONS	DORY HOURS
APRIL			44	67			44	67
MAY			1,236	707	67	20	1,303	727
JUNE			1,334	733	122	104	1,456	837
2 nd QUARTER			2,614	1,507	189	124	2,803	1,631
JULY	6	40	1,376	1,312			1,382	1,352
AUG.			2,494	750			2,494	750
SEPT.			1,427	565			1,427	565
3 rd QUARTER	6	40	5,229	2,627			5,303	2,667
1973	6	40	7,911	4,134	189	124	8,106	4,298

