REVISION OF CATCH DATA FOR BLUEFIN TUNA IN GREECE

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SUMMARY

The bluefin tuna fishery in Greece underwent considerable change in 1992. Several boats were involved in this fishery for many years, and these vessels expanded their activities to wider fishing zones in the eastern Mediterranean.

Because of these changes, the collection of catch data on bluefin tuna was insufficient. This is due mainly to the large number of fishing vessels and landing sites, to the geo-morphologic profile of the Greek coasts, and to the lack of logbooks in the Mediterranean.

The ICCAT records for Greek catches were under-estimated, since they were mainly based on the Bluefin Tuna Statistical Documents sent to Japan. The present report attempts to estimate the real bluefin tuna production for the years 1987-1997 using export, landings and by-catch data, segmented by fishing gear.

RÉSUMÉ

La pêche de thon rouge en Grèce a beaucoup évolué depuis 1992. Plusieurs bateaux engagés chaque année dans cette pêcherie ont étendu leurs activités à des zones de pêches plus amples de la Méditerranée orientale.

Cette évolution a rendu insuffisante la collecte de données de capture sur le thon rouge. Le grand nombre de bateaux de pêche et de points de débarquement, le profile géomorphologique des côtes grecques et l'absence de carnets de pêche dans la Méditerranée en sont les principales causes.

Les registres de l'ICCAT sur les prises grecques ont été sous-estimés du fait qu'ils se basaient surtout sur les BTSD destinés au Japon. Le présent rapport tente d'estimer la production réelle de thon rouge des années 1987-1997 d'après les données d'exportation, de débarquement et de prise accessoire, ventilées par engin.

RESUMEN

La pesquería de atún rojo en Grecia experimentó una gran evolución en 1992. Numerosos barcos se fueron implicando en esta pesquería de un año a otro, que amplió sus actividades en caladeros más extensos en el Mediterráneo este.

Debido a esta evolución, se hizo insuficiente la recolección de datos de atún rojo. Los motivos principales son el gran número de barcos pesqueros y lugares de desembarco, el perfil geomorfológico de las costas griegas y la falta de cuadernos de pesca en el Mediterráneo.

Los registros de ICCAT con respecto a las capturas griegas están subestimados, ya que se basaban principalmente en los DEAR de Japón. El actual informe trata de estimar la producción real de atún rojo para los años 1987-1997 utilizando datos de exportación, desembarque y capturas fortuitas, divididos por año pesquero.

1. INTRODUCTION AND PRESENT ICCAT DATA BASE

Greek Ministry of Agriculture, Directorate General for Fisheries, in collaboration with University of Athens, Department of Biology, worked out the present technical report for the revision of catch data for bluefin tuna for Greece in the Mediterranean for the years 1987-1997. The procedures adopted in the review of series of historical bluefin catch data were further discussed with Dr. P. Miyake, the ICCAT Assistant Executive Secretary, with actual basic data used for revisions. This report is submitted to the ICCAT with a copy to the European Commission.

Greece had collaborated fully with ICCAT, even while Greece was not a member of the ICCAT. The collaboration was sometimes direct scientific contribution by its scientists to the Commission and often through the GFCM to which Greece has been a member; and included providing basic fishery data.

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Since the European Community became member of the ICCAT in November 1997, data collection for the compilation of tunas and tunalike fishes has became the obligation of the Greece and closer review of the historical bluefin data has also commenced.

The sources of the current Task-1 catch data kept in the ICCAT data base are as follows:

Year	Method	Quant. (MT)	Source
1990	Hand	155	GFCM meeting, September, 1992
1991	Hand	123	ICCAT BFT Working Group, Sep. 1993
1992	Hand	100	FAO/GFCM Official data, March, 1998
1993	Hand	96	FAO/GFCM Official data, March, 1998
1994	Hand	362	SCRS BFT Group, 1995
1995	Hand	615	FAO/GFCM Official data, March, 1998
1996	Hand	1403	FAO/GFCM Official data, March, 1998

Data taken from official report to FAO/GFCM is compiled by the Greek National Statistical Office. Since this institute covers all the national aspects, including industry, economics etc. the fishery data are not well organized in terms of species and fishery. Therefore, these official data do not bear the criteria requested by ICCAT for the scientific best estimates.

GFCM and SCRS estimates, used in lack of FAO/GFCM official data, were made mostly based on the import data to Japan and consequently do not include the whole Greek production. ICCAT reports themselves warned that these estimates are minimum estimates of Greek catches.

Discussions and results of the SCRS in Genoa, Italy (7-11 Sep.) were extremely useful for completing present work and it became very clear that the catch data in the ICCAT base is not the best scientific estimates.

2. GENERAL OVERVIEW OF BLUEFIN TUNA FISHERIES IN GREECE

First investigations concerning large pelagic fisheries in Greece were carried out in 1986. According to the technical report of the study (FAO, 1989a), the fishing for bluefin tuna in Greece at that time was restricted to the northern Aegean Sea, mainly around the peninsula of Chalkidiki and along the eastern Macedonian and Thracian coasts. Only 55 boats using mainly hand line as well as purse seines and encircling gillnets carried out bluefin tuna fishing seasonally (mainly from the begining of September to the end of April) whereas they carried out other fishing activities during the rest of the year. The total production in 1986 estimated by area and gear amounted 131 tons. The fish caught by hand line are relatively large fish (over 150 cm), while the fish taken by purse seine are medium sized fish (100 cm to 170 cm).

By the year 1992 a great evolution has been observed in the bluefin fishery. A lot of new vessels have been involved in the fishery year by year using mainly hand lines. After that period Greek fishermen began to use more variety of fishing gears for catching bluefin tuna. In 1995, some vessels were equipped with Japanese-style longlines. Moreover the fishing areas have been expanded all over Greek seas in the Aegean and Ionian sea as well as in the Levant sea (see Map 1). Fishing seasons were extended September to April while general size of catches varied from hand line (30-300 Kg -live weight), purse seine (25-90 Kg) or longline (6-20 Kg).

Two were the main reasons that diverted the greek fiisherman on the bluefin fishery:

- The demand of the market and especially the high prices obtained by the exportations and
- the Greek legislation concerning the swordfish fishery.

In fact, the high prices of bluefin tuna and the prohibition of the swordfish fishing from October to February each year led a lot of swordfish fishermen to the bluefin tuna fishing. In a national report of the Ministry of Agriculture in 1997 to the European Commission it is estimated that the number of vessels that can potentially be involved in the bluefin and swordfish fisheries in a seasonal, constant or sporadic basis exceed the 500.

Also, since 1992 has progressively began the development of collection of statistical data, such as that for:

- Exports of bluefin tuna,
- Landings through auction halls for the domestic market, and,
- By-catches.

Above data have contributed to a more accurate registration of bluefin tuna catches.

Moreover, we must point out that Greece, following the rapid growth in bluefin tuna catches by Greek fishermen, has immediately taken management measures for its conservation (prohibition of using driftnets).

3. PROBLEMS IN COLLECTING CATCH DATA

It is detected that insufficient collection of bluefin tuna catch data are due to the following main problems:

a. The number of fishing vessels is not well identified as the evolution of bluefin tuna fishery in Greece was very rapid. A great number of new vessels were involved in this fishery and the areas of fishing were expanded.

b. The great number of fishing ports where landings of fish products is performed.

c. The geomorphologic profile of greek coasts (highly spread islands and extended coasts, continental or insular), in combination with insufficient communication between islands in winter months.

d. A considerable number of vessels fishing bluefin tuna make long-day journeys (in territorial or international waters).

e. The lack of log-book in fishing vessels operating in Mediterranean.

f. Many new areas where bluefin tuna is caught are not monitored by a scientific institution, so collection of catch or biological data is insufficient.

Such vessels is not easy to be monitored or controlled successfully. Nevertheless, situation is much improved last year; fishermen involved in bluefin tuna fishery started to report their catches and reliable catch data are collected. This is due to Community reglementation adopted after adhesion of European Union to ICCAT, the allocated quota for the species and the obligation of member states to monitoring catches.

4. MODIFICATION OF CATCH DATA

Examining the bluefin tuna catches reported in Task-1 for Greece, it is noticed that these do not represent the real catches and according to previous considerations these are underestimated. In fact, for the seven year period 1987-1993 the trend of the reported bluefin tuna catches in Task-1 are declined instead to be increased. The mean yearly catch was only 113 tons.

It can be assumed that the underestimation of the Greek bluefin catches derived almost from the method used to estimate them. Due to the lack of national official data, during the 1992 GFCM/ICCAT Consultations in Crete, the Greek bluefin tuna catches were exclusively estimated for 1985 through 1991 by applying a factor of 1.9 on the Japanese imports originating Greece (ICCAT, 1993, p. 20).

In 1994 the underestimation of the catches is greater considering that it was not applied the ratio on the Japanese imports and the catches reported are made up only from the live weight of the imports to Japan. Lack of reliable data is also recognized by ICCAT. As already described in the 1st Chapter, when catches of a state were not reported, relevant ICCAT statistical document was used as a minimum estimation (ICCAT, 1997, p. 42).

5. SOURCES FOR APPROACHING RELIABLE BLUEFIN TUNA DATA

Our attempt to represent the real catches of bluefin tuna is divided in two periods according the data used:

- From 1987 to 1991
- From 1992 to 1997.

I. 1987-1991

To update the first series of data (Table 1) we took into account the evolution of the fishery described previously by gear (purse seine, hand/pole line, longline) as well as the exports to Japan (ICCAT data). The Greek exportation to Japan is fresh tuna gutted and beheaded caught by hand line. For this reason the catches of the hand line fishery were estimated as the live weight of the Japanese imports originating Greece plus 10% (Table 1, col. B). The 10% corresponds to the fish caught by hand lines not exported to Japan due to its lower quality. This kind of fishery targets mostly big bluefin tuna. To update the catches it was also taken into account by-catch quantities of small bluefin tuna caught by the albacore fishery using longline or troll line (FAO, 1989b) throughout all years (Table 1, col. C). Purse seines catch (Table 1, col. D) is considered to be similar to those of the second period described in Table 2 (see below). Catches of one trap and recreational fishing are estimated to be of minor importance (less than 3-4 tons per year) and they are omitted for simplification.

II. 1992-1997

To update the second series of catch data (Table 2) we took into consideration the same as above. However, as the examined period was more recent, data have been collected through market elements too, like auction halls (where first wholesale is made), main landing sites where auction hall does not exist (landings are directed to local market) and exporting enterprises. An estimation has also been made for by-catch quantities due to swordfish and albacore fisheries.

The details of procedures adopted for estimations are described below, following the commercial flow shown in Diagram 1.

A. EXPORT DATA

A1. Export to Japan

Since 1994, the Bluefin Statisical Document (BFSD) Program has started according to the ICCAT recommendations and all the bluefin exported to the ICCAT member countries (mostly to Japan) has to accompany BFSD validated by the Government Officials. However, it was not fully implemented until 1995 for both frozen and fresh fish. Estimates of round weight (converted) provided by the ICCAT Secretariat (SCRS/98/8) for export from Greece to Japan were used for this category of estimates (Table 2, col. B) and they cover sub-period 1995-1997. However, there are some doubt about the nature of products reported on the BFSD, as some bluefin were recorded as gilled and gutted or round in the document, while most of the bluefin exported to Japan from Greece is dressed (head off, gilled and gutted). This may effect on the conversions. This study will carry out in the future.

For earlier years (1992-1994) the export data have been obtained by the Economic & Commercial Division of Greek Embassy in Japan after retrieving data from the Special Service of Japanese Ministry of Economics "Japan Tariff Association". The Embassy reported us quantities originating Greece entered Japan under the tariff code 0302 39 010, which were converted to round weight by the official ICCAT factor 1.25 (Table 2, col. B).

A2. Exports to other international markets than to Japan.

The export data obtained from seven exporting companies (raised by 1.2 to estimate the whole exported quantity) were used as the base and they were converted into round weight using ICCAT official conversion factor of 1.25, given that all of these were in dressed weight (Table 2, col. C). Information given by these enterprises is more or less detailed by destination and invoice. An extract of such reports is presented as sample in Appendix 1.

Exported quantities of bluefin tuna are not marketed through auction halls, since the need for immediate handling of fish oblige exporters to have a network for collecting catch from fishing vessels, to deliver it to their own installations and provide direct supply with ice, water, packing boxes etc.

B. FOR DOMESTIC MARKET

B1. Records of Auction Hall

In Greece, there have been 10 (now 11) official auction halls (see Map 1), monitored by the Ministry of Agriculture. Some tuna caught are sold through these auctions. The records of auctions are available since 1990 (see sample attached herewith as Appendix 2), and those were all checked. The total given in the Table 1, col. D, is the sum of those annual records, raised by 1.13 as the presentation of the species is gilled and gutted.

Tunas which are exported do not go through the Auction Hall, since they are directly sold to the buyers, as described above.

B2. Fish sold to domestic markets but not went through Auction Hall

About 70% (depending the species) of the total catch of fish are sold outside of Auction Hall. Those are estimated using various methods.

B2-a Purse seine catches

Purse seiners catches targeting bluefin tuna (Table 2, col. E) are estimated to 32 tons yearly, after a report to C.E.C DG-XIV (De Metrio G. *et al.*, 1996). Similar figure is used to estimate the purse seine catches for the earlier period 1987-1991.

B2-b By-catch of swordfish longline gears

A certain quantity of bluefin tuna is caught as by-catch in the swordfish fishery. De Metrio G. *et al.*, 1987, consider this to reach the 2% of the swordfish caught by longlines. Table 2, col. F estimates by-catch due to swordfish fishery by longliners.

B2-c By-catch of albacore longline gears

Estimates of by-catches quantities of bluefin tuna due to albacore fishery is almost stable (Table 2, col. G), according to FAO, 1989b and De Metrio G. *et al.*, 1997.

B2-d Traps and recreational fisheries

There is one or two permanent offshore installations using a net lifter to catch species entering the trap. Bluefin tuna is caught as by-catch. These quantities are minor (less than 2 tons yearly) and they are not reported here.

A competition is organized last years in northern Greece among amateurs for large scombroids. Quantities caught (by pole line) are minor (less than 3 tons yearly), and they are not reported too.

Of course there is not a clear line for catch of each fishing gear to be marketed or not to be marketed through auction halls. For example not all handline catch is traded through auctions; additionally some purse seine catches are recorded in auction halls bulletins. Generally speaking, it is assumed that a positive bias of such records is balanced with the negative one of some others.

ACKNOWLEDGEMENTS

We wish to acknowledge Dr. Peter Miyake for his comments on an earlier draft and for useful discussions concerning research through presently available data. Without his critical remarks this work could not be done.

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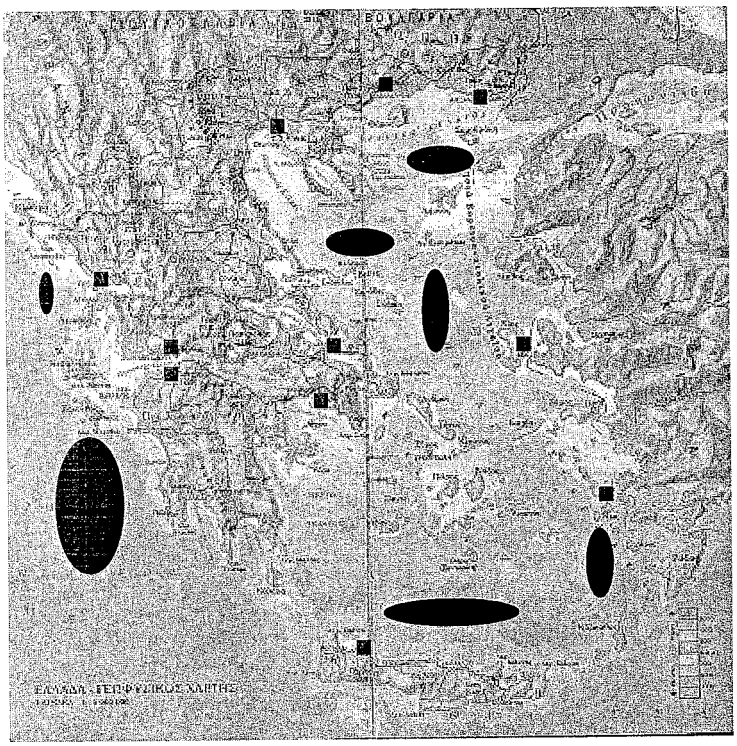
MAP 1
Geophysic map of Greece showing established auction halls for fish first sale and main fishing areas for bluefin tuna



Auction halls

Main fishing areas for bluefin tuna

TABLE 1
BLUEFIN TUNA CATCHES FOR THE YEARS 1987-91

Quantities in tons

	Catch methods			
Year	Hand line	Longline	Purse seine	**TOTAL**
A	B	C	D	**E**
1987	79	37	40	**156**
1988	82	37	40	**159**
1989	105	37	40	**182**
1990	124	37	40	**201**
1991	98	37	40	**175**

DIAGRAM 1
Commercial flow of bluefin tuna catches in Greece

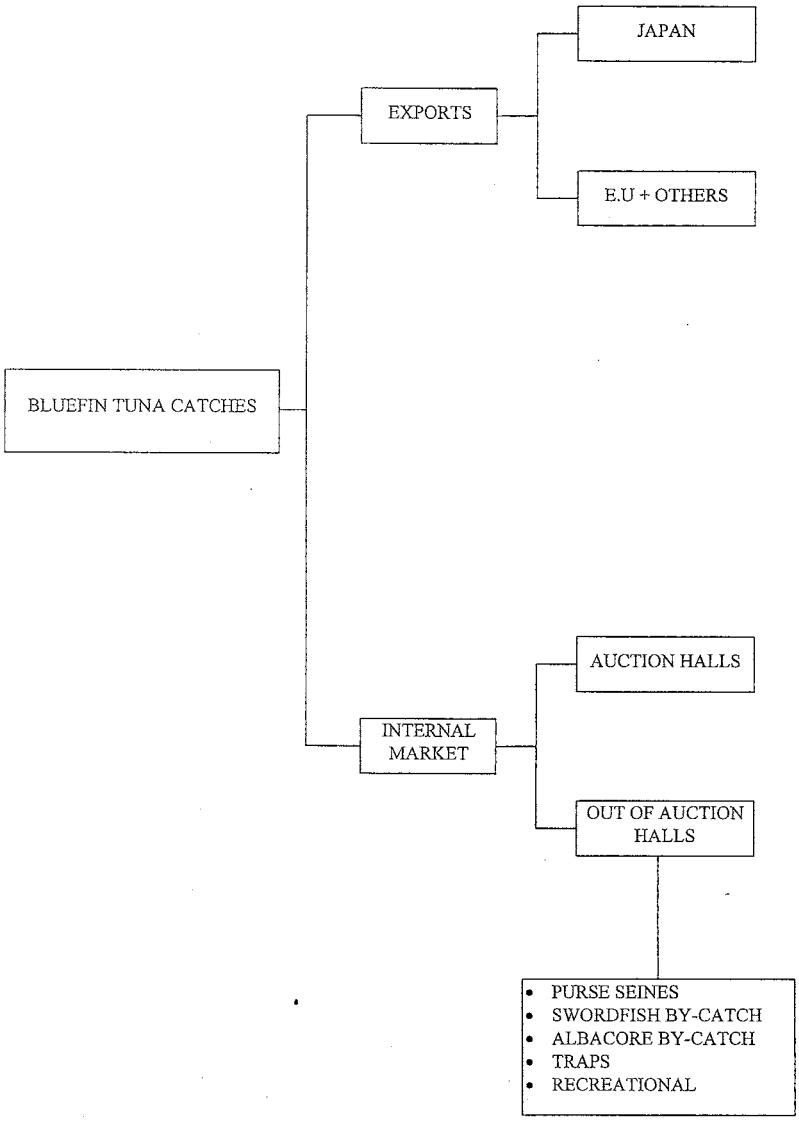


TABLE 2
BLUEFIN TUNA CATCHES FOR THE YEARS 1992-97

Quantities in tons

	Exports		Local market				
Year	Japan	E.U + others	Auction hall	Purse seine target	Swordfish by-catch	Albacore by-catch	**TOTAL**
A	B	C	D	E	F	G	**H**
1992	62	255	31	32	29	38	**447**
1993	228	102	9	32	30	38	**439**
1994	551	135	80	32	50	38	**886**
1995	455	245	215	32	19	38	**1004**
1996	431	111	242	32	20	38	**874**
1997	538	297	292	32	20	38	**1217**

APPENDIX 1

EXTRACT OF INFORMATION GIVEN BY AN EXPORTING COMPANY FOR QUANTITIES FORWARDED TO INTERNATIONAL MARKET

SEVEN SEAS FISH Co

PHONES: 051 222 652, 243.638 FAX 051 835 629, 245 391 TELEX 452181 MEC
VENIZELOU 1 St KAVALA - GREECE

J. KARABOURNIOTIS
FISH IMPORT - EXPORT

Refer to
Date

Α/Α	ΠΕΛΑΤΗΣ	ΧΩΡΑ	ΗΜΕΡΟΜΗΝΙΑ	ΚΑΘΑΡΟ ΒΑΡΟΣ
No 1	WESTSHORE	ΚΑΝΑΔΑΣ	20-10-94	200 kgr
No 2	PACIFIC TRADING	ΙΑΠΩΝΙΑ	20-10-94	547 kgr
No 3	T&S ENTERPRISES	ΛΟΝΔΙΝΟ	22-10-94	192 kgr
No 4	PACIFIC TRADING	ΙΑΠΩΝΙΑ	24-10-94	536 kgr
No 5	T&S ENTERPRISES	ΛΟΝΔΙΝΟ	26-10-94	254 kgr
No 6	PACIFIC TRADING	ΙΑΠΩΝΙΑ	27-10-94	497 kgr
No 7	PACIFIC TRADING	ΙΑΠΩΝΙΑ	30-10-94	661 kgr
No 8	T&S ENTERPRISES	ΛΟΝΔΙΝΟ	30-10-94	341 kgr
No 9	"	ΛΟΝΔΙΝΟ	1-11-94	310 kgr
No 10	"	ΛΟΝΔΙΝΟ	4-11-94	1.110 kgr
No 11	WESTSHORE	ΚΑΝΑΔΑΣ	4-11-94	224 kgr
No 12	T&S ENTERPRISES	ΛΟΝΔΙΝΟ	12-11-94	519 kgr
No 13	PACIFIC TRADING	ΙΑΠΩΝΙΑ	12-11-94	569 kgr
No 14	"	ΙΑΠΩΝΙΑ	14-11-94	212 kgr
No 15	"	ΙΑΠΩΝΙΑ	16-11-94	169 kgr
No 16	T&S ENTERPRISES	ΛΟΝΔΙΝΟ	17-11-94	185 kgr
No 17	PACIFIC TRADING	ΙΑΠΩΝΙΑ	17-11-94	314 kgr
No 18	T&S ENTERPRISES	ΛΟΝΔΙΝΟ	18-11-94	460 kgr
No 19	PACIFIC TRADING	ΙΑΠΩΝΙΑ	19-11-94	1.053 kgr
No 20	"	ΙΑΠΩΝΙΑ	21-11-94	595 kgr
No 21	"	ΙΑΠΩΝΙΑ	22-11-94	753 kgr
No 22	"	ΙΑΠΩΝΙΑ	25-11-94	830 kgr
No 23	T&S ENTERPRISES	ΛΟΝΔΙΝΟ	27-11-94	516 kgr
No 24	"	ΛΟΝΔΙΝΟ	29-11-94	579 kgr
			Σε μεταφορά.	11.456 kgr

APPENDIX 2

EXTRACT OF ANNUAL BULLETIN OF SPECIES MARKETED THROUGH AUCTION HALLS (BLUEFIN CODED AS 094) SHOWING QUANTITIES, VALUES AND MEAN VALUES

ΚΩΔ ΑΡΙΘ	ΕΙΔΟΣ ΙΧΘΥΩΝ	ΙΧΘΥΟΚΑΛ-ΒΟΤΙΑ	ΒΑΡΟΣ ΕΙΣ ΧΙΛΙΟΓΡΑΜΜΑ	ΑΞΙΑ	ΜΕΣΗ ΤΙΜΗ	ΔΙΑΜΟΡΦΩΘΕΙΣΑΙ ΤΙΜΑΙ	ΣΥΝΑΦΗ ΕΙΔΗ
	Εκ μεταφοράς		24.318.464	12.266.056.351			
048	Μπαρμπούνια		653.481	863.423.804	1.349		
049	Μυλοκόπια		1.779	2.330.464	1551		
050	Μαζιτέρια		44.481	24.590.495	553		323
051	Μυτάκια		7.491	13.077.650	1.739		057
052	Νταούκια		216.401	104.477.069	550		
053	Ντόσκες		66.789	18.084.666	271		
054	Ξιφίας		346.884	466.731.353	1.346		
055	Ξυρίχιο		—	—	—		
056	Ορτσίνια		28.881	7.396.140	266		
057	Ούγκες		11.099	15.891.132	1.432		051
058	Παλαμίδες		53.301	53.545.684	1005		
059	Πεταλίδες		327	136.350	418		
060	Πέρκες		743	261.000	351		
061	Πεσκανδρίτσες		610.040	214.963.451	352		
062	Πισσί		3.947	4.808.050	1218		019
063	Ποντίκια		6.711	3.137.300	467		
064	Προσφυγάκια		990.665	242.063.425	244		
065	Ρίνες		103.232	23.117.514	224		
066	Ρίκια		50.662	20.150.665	397		
067	Ρινόβατο		65.215	17.350.329	266		
068	Ροφοί		11.270	17.964.551	1594		
069	Σαλάχια		42.487	19.277.369	452		
070	Σάλπες		339.024	215.975.266	635		
071	Σαυρίδια		124.423	24.180.150	194		
072	Σαργιέρι		1.756	[illegible]	759		106
073	Σαρπαδάκια		31.251	6.650.476	212		
074	Σαργοί		47.411	81.451.529	1.718		
075	Σαρδέλλες		7.372.154	1.064.066.313	145		
076	Σαφρίδια Άσπρα		2.312.752	564.641.142	244		
077	Σαφρίδια Μαύρα		117.243	55.243.297	471		
078	Σκαθάρια		39.600	55.652.767	1.406		
079	Σκαρμοί		30	6.000	200		
080	Σκάροι		362.262	152.105.602	420		
081	Σκιοί		30	21.000	700		049
082	Σκλερπόδες		365	159.000	444		061
083	Σκορπιοί		41.888	49.990.252	1194		
084	Σκουμπριά		549.647	256.135.660	466		
085	Σκυλάκια		12.621	3.863.450	306		
086	Σμέρνες		4	4.600	1150		
087	Σοδροι		557	116.800	209		
088	Σπάροι		96.110	42.378.110	441		
089	Σπουρδίτες		10	5.000	500		055
090	Στήρες		3.128	2.962.114	947		
091	Συναγρίδες		23.962	55.178.164	2.303		
092	Σφυρίδες		24.888	49.152.062	1975		
093	Τονάκια		715.625	188.909.173	264		
094	Τόννοι		71.648	54.858.188	766		
095	Τριχιός		540	59.150	109		
096	Τσίρουλες		41.730	25.606.020	[illegible]		
097	Τσιπούρες		1.363.679	2.039.568.347	1496		
098	Φαγγριά		60.279	128.711.165	2.135		
099	Φασσιά		1.219	1.444.350	1.185		
	Εις μεταφοράν		46.041.699	19.376.661.069			