

Report on the recovery of historical data of bluefin tuna catches in the Portuguese tuna traps

by

João Gil Pereira

Universidade dos Açores

Horta, Portugal

Summary

Historical data of the bluefin tuna catches in the Portuguese traps, was recovered under the GBYP Data Recovery Plan on Historical bluefin tuna. The data recovered includes the Task-I and Task-II data of the Portuguese trap fishery on BFT between 1896 and 1972. Complementary information recovered, included daily catches for several traps, in number of fish and corresponding weights for a large number of years, between 1876 and 1972.

Information concerning Portuguese imports of large bluefin tuna from Moroccan traps, from 1948 to 1965 includes the total number of fish imported and the corresponding weights.

Introduction

In April 2011, a contract has been signed between the University of Azores and ICCAT, under the GBYP Data Recovery Plan on Historical bluefin tuna (Call for Tenders, Circular n. 320/2011), in order to support the recovery of historical data of the bluefin tuna catches in the Portuguese traps.

The work has been developed according to the main objectives of the contract, i.e., the recovery of the Task-I and Task-II data of the Portuguese trap fishery on BFT between 1896 and 1971. This objective was fully achieved and the detailed data collected was transmitted to ICCAT. A preliminary presentation of the data recovered was presented at the Bluefin tuna trap symposium in Tangier, Morocco, in May 2011.

During the data recovery, information was also found concerning some Portuguese imports of large bluefin tuna from Moroccan traps. This information from 1948 to 1965 includes the total number of fish imported and the corresponding weights. The recovery of this information was

included in the contract as a secondary objective, was also presented at the Bluefin tuna trap symposium in Tangier, Morocco, in May 2011, and is presented in annex

During the research done in some historical archives, more detailed and complementary information was found and recovered. This complementary information recovered, included daily catches for several traps, in number of fish and corresponding weights for a large number of years, between 1876 and 1972.

Recently (August, 2011), new detailed information was found and recovered in some municipal archives. This new information is presently been processed to be transmitted to ICCAT.

Detailed description of the recovered datasets

Information concerning the historical Portuguese tuna trap catches is now available for a large number of years, with different kinds of detail.

The most detailed data concerns the period from 1896 to 1972. For this period, the information was obtained by trap, month and/or 2 month periods: May/June; July/August, corresponding to the 2 fishing seasons, the first called “direito” for the fish entering the Mediterranean and the second “revés” for the fish going out of the Mediterranean.).

The catches of bluefin tuna were recorded in number and by commercial category, since the bluefin caught by the Portuguese traps were commonly recorded in number of fish, qualified in 4 commercial categories (“atum”: > 90 kg; “atuarro”: from 50 to 89 kg; “albacore”: from 30 to 49 kg; “cachorreta”: <30 kg). A fifth category, the “cachorretitas”, used for fish less than 10 kg was also found in some of the detailed records from some traps. Some of the traps did not include in their official catch declarations the smaller sizes, the “albacore”: from 30 to 49 kg; and “cachorreta”: <30 kg. However, in the cases where the detailed records are available, information on the catches of these small fish was also recovered and it’s now available for some traps/years. The commercial categories used in Portugal for bluefin and their respective weights and sizes, are given in table 1.

Portugal - Commercial Categories (BFT)			
CCatID	CCatName	Description	MeanWprev(kg)
CC1	Small (< 10kg)	Cachorretitas	5
CC2	Small (< 30kg)	Cachorretas (< 1.00 m)	20
CC3	Medium (30>= X < 50 kg)	Albacora (1.00 m>= X < 1.30 m)	40
CC4	Medium (50>= X < 90 kg)	Atuarros (1.30 m>= X < 1.90 m)	70
CC5	Large (>= 90 kg)	Atum > 1.90 m	150

Table 1. Commercial categories for bluefin tuna used in the Portuguese statistics

In the data recovered for some traps/years, different values were found for the total catch of bluefin or for the catches by commercial category. This can be explained by the fact that in some traps, only the large bluefin were recorded or when reporting the total annual catch referred only to large bluefin (atum category), the other size categories were converted to atum (2 atuarros, 4

albacoras or 8 cachorretas corresponded to 1 atum). However, since we had the possibility of consulting records with several levels of detail, this situation has been corrected in many cases.

For some years and traps, it was also possible to recover information on daily catches by commercial category, including the information on the respective weights. This information is available for 4 traps from 1962 to 1967 and from 1958 to 1972 for 1 trap. (table 4). This detailed records allowed the estimation of daily average weights for the different size categories of bluefin tuna caught in south Portugal, from 1958 to 1972.

The recovered information is presented in several files, containing the following information:

1. Catches in number of fish by commercial categories, by trap, year and month. Includes 11 traps and 1042 records
2. Catches in number of fish by commercial categories, by trap and year. Includes 24 traps and 699 records
3. Catches in number of fish by commercial categories, by trap, year and season (bi-monthly). Includes 24 traps and 1034 records
4. Estimated total catch of bluefin tuna, in weight, by commercial categories from 1896 to 1972.
5. Daily catches in number of fish and respective weight. Includes 5 traps and 4878 records.
6. All the detailed information collected was merged in a single excel file and transmitted to ICCAT GBYP.

Type of support

The information was found in different locations, including public and private libraries, historical archives, historical municipal archives and some private collections. Some of the public libraries/archives where information was collected are listed below:

Instituto Nacional de Estatística
Biblioteca, Direcção Geral das Pescas e Aquicultura
Arquivo Histórico da Direcção Geral das Pescas
Arquivo do Grémio dos Armadores de Atum (GAPATUM)
Arquivo Distrital de Faro
Arquivo Municipal de Tavira
Arquivos da Companhia de Pescarias do Algarve, Faro
Bibliotecas Municipais da Horta, Ponta Delgada e Tavira

Given its historical content (centenary data in its majority) and its dispersion across the various data sources, a considerable travelling was necessary to consult and collect the information. For some years and traps, the catch information of the different sources is contradictory, which required a further validation process.

The sources containing the information are of variable quality (mostly in paper) and were found throughout many publications and documents of different types, including statistical bulletins, daily traps records, financial reports of the traps societies and other historical documents. The detailed records from the traps are mostly handwritten with different levels of quality.

Due to the difficulty in the interpretation of the handwritten information and the amount of paper records found, most of the archives were photographed and processed later.

A short summary of the recovered information is presented in the figures and tables bellow.

Trap	Period	Number of years
Abóbora	1896-1965; 1970	71
Barril (3 Irmãos)	1867-1966	100
Beliche	1905;	1
Bias	1896; 1898-1899; 1901-1909; 1914-1921	20
Burgau	1903-1904	2
Cabeço	1896-1897	2
Cabo de Stª Maria	1896-1903; 1905-1910; 1914-1965; 1967	67
Farol	1898-1902; 1905;	6
Forte Novo	1896-1918; 1920	24
Medo branco	1903-1904; 1907-15; 1922	12
Medo das Cascas	1852-1972	121
Olhos de Água	1896-1919;	24
Pedra da Galé	1894-1904	9
Penedo do Sono	1910	1
Ramalhete	1896-1921; 1923-1930	34
Srª da Rocha	1897-1919	23
Srª do Livramento	1896-1969	74
Sul da Ponta Baleeira	1902-1926	25
Sul da Ponta do Zavial	1897-1911	15
Sul do Cabo Carvoeiro	1896-1913; 1915-1917	21
Torre Alta	1896-1904	9
Torre Altinha	1896-1909	14
Torre da Barra	1897-1917	21
Vau	1896; 1898-1899	3
Total		699

Table 1. Historical tuna traps in southern Portugal and years for which data on bluefin catches were recovered (catches in number of fish by commercial categories).

GBYP Data Recovery Plan on Historical bluefin tuna (Call for Tenders, Circular n. 320/2011)

Year	Month								Total	Year	Month								Total
	3	4	5	6	7	8	9	3			4	5	6	7	8	9			
1876				1	1	1			3	1940			5	5	4	4			18
1877				1	1	1			3	1941			4	5	5	4			18
1878				1	1	1			3	1942			5	5	4	4			18
1879			1	1	1	1			4	1943			5	5	4	4			18
1880			1	1	1	1			4	1944			5	5	4	4			18
1881			1	1	1	1			4	1945			5	5	4	4			18
1882			1	1	1	1			4	1946			5	5	4	4			18
1883			1	1	1	1			4	1947			5	5	4	4			18
1898			2	2	2	2			8	1948			5	5	4	4			18
1918			11	9	5	5	2		32	1949			5	5	4	4			18
1919			7	10	5	5			27	1950			5	5	4	4			18
1920			8	9	5	5			27	1951			5	5	4	4			18
1921			8	8	7	6			29	1952			5	5	4	4			18
1922			7	7	5	5			24	1953			5	5	4	4			18
1923			6	7	4	5			22	1954			5	5	5	4			19
1924			7	7	5	5			24	1955			5	5	4	4			18
1925			7	7	6	5			25	1956			5	5	5	4			19
1926			7	7	5	4			23	1957			5	5	4	4			18
1927			6	6	5	4			21	1958			5	5	4	4			18
1928			6	6	5	4	2		23	1959			5	5	4	4			18
1929			6	6	4	4			20	1960			5	5	4	4			18
1930			6	6	4	4	1		21	1961			5	5	4	4			18
1931		1	5	5	4	4			19	1962			5	5	4	4			18
1932			5	5	4	4			18	1963			5	5	4	4	1		19
1933			5	5	4	4			18	1964	1	1	5	5	4	4	2		22
1934			5	5	4	4			18	1965			5	5	4	3	1		18
1935			5	5	4	3			17	1966			2	3	3	4			12
1936			5	5	4	4			18	1967		1	3	3	3	1			11
1937			5	5	4	4			18	1968			2	2	2	2			8
1938			5	5	4	3			17	1969			2	2	2	2	1		9
1939			5	5	4	4			18	1970			2	2	2	2			8
										1971						1			1
										1972					1	1			2
										Total	1	3	284	292	231	221	10		1042

Table 2. Number of tuna traps with monthly catch data recovered (catch in number of BFT, by commercial category)

GBYP Data Recovery Plan on Historical bluefin tuna (Call for Tenders, Circular n. 320/2011)

YEAR	TRAP									
	Abobora		Barril		Cabo Stª Maria		Medo das Cascas		Srª do Livramento	
	N	W (kg)	N	W (kg)	N	W (kg)	N	W (kg)	N	W (kg)
1876							23215			
1877							27122			
1878							40805			
1879							21045			
1880							29602			
1881							43667			
1882							22954			
1883							25889			
1942							8110			
1943							8542			
1944							2540			
1945							4288			
1957							2054			
1958							861	15430		
1959							5592	90199		
1960							2092	65449		
1961					1983		2578	86483		
1962	666	97548	1011	150023	1626	217185	731	100513	675	90921
1963	429	56676	729	91784	719	105268	640	70064	513	67701
1964	4479	42849	1967	124649	167	23187	2764	113522	2059	94677
1965	89	10327	263	34229	109	11494	261	30198	77	10518
1966			1807	39611			1024	91367	273	22503
1967							1181	165532	95	12887
1968							213	35286		
1969							7956	326334		
1970	39	5827					452	13854		
1971							1	8		
1972							4847	11547		
Total	5 702	213 227	5 777	440 296	4 604	357 134	286 738	1 215 786	3 692	299 207

Table 3. Tuna traps and years for which daily catches in number of BFT, by commercial category, and respective weights, were recovered.

GBYP Data Recovery Plan on Historical bluefin tuna (Call for Tenders, Circular n. 320/2011)

Season: Direito (incoming)						Season: Revés (return)					
Year	Nb Traps	Atum > 90 kg	Atuarro (50-90 kg)	Albacora (30-50 kg)	Cachorreta (<30kg)	Year	Nb Traps	Atum > 90 kg	Atuarro (50-90 kg)	Albacora (30-50 kg)	Cachorreta (<30kg)
1896	14	18688	4794	1315		1896	7	33313	4305	46	
1897	15	22883	3996	2953		1897	9	43923	6043	380	
1898	17	30638	5287	8177		1898	11	25931	3253	323	
1899	17	21575	4393	1118		1899	9	37042	10004	1652	
1900	15	9779	2783	1766		1900	8	33253	10329	2541	
1901	16	27661	5324	1439		1901	8	13583	6738	2902	
1902	16	7899	4513	2357		1902	9	20780	15983	3039	
1903	17	13848	6556	4834		1903	12	40896	16548	12935	
1904	15	25553	11751	1098		1904	12	20906	7933	418	
1905	15	21420	4957	1609	893	1905	10	47484	4117	119	
1906	14	26628	3001	319		1906	9	57402	4808	519	
1907	14	19333	4808	599	374	1907	8	19138	723	184	145
1908	14	14311	5465	1176	195	1908	9	16983	1125	500	23
1909	15	9347	4345	3036	2489	1909	9	13154	5529	629	42
1910	13	10099	2521	3126	4629	1910	7	6640	2514	316	51
1911	12	5969	2123	1675	656	1911	7	13404	2282	1834	
1912	12	7174	3634	2371	198	1912	6	11988	3597	1042	50
1913	12	8829	2194	2655	2343	1913	6	25889	3272	502	56
1914	13	25797	2417	1252	1999	1914	5	16244	3138	1082	799
1915	14	17234	3096	1258		1915	7	14383	310	162	8
1916	13	5165	1628	317	115	1916	6	5683	1031	209	145
1917	13	7272	2163	521	989	1917	6	11098	1759	1847	223
1918	12	1757	518	462	209	1918	5	4480	1303	557	1979
1919	11	3220	588	200	771	1919	5	7457	1816	884	264
1920	10	6637	714	723	695	1920	5	13238	1953	3817	106
1921	9	3838	917	538	116	1921	8	7020	818	345	21
1922	8	2522	1714	1108	506	1922	5	3387	490	264	302
1923	8	904	665	445	777	1923	5	6939	604	222	121
1924	8	4947	964	350	7765	1924	5	3265	1104	85	51
1925	8	3889	540	378	518	1925	6	1029	519	67	3
1926	8	2598	831	502	4181	1926	5	3294	357	63	0
1927	7	12913	1069	44	18	1927	5	2352	136	19	2
1928	7	9109	955	307	133	1928	6	11774	546	90	98
1929	7	3322	1317	379	501	1929	4	5480	1257	173	84
1930	7	5584	702	380	166	1930	4	7344	1130	170	3
1931	5	7399	1922	859	221	1931	4	4388	898	66	78
1932	5	5655	627	436	132	1932	4	8314	278	202	17
1933	5	9468	1135	820	260	1933	4	3931	424	194	42
1934	5	2759	389	329	82	1934	4	4199	329	349	279
1935	5	2393	1296	593	147	1935	4	3837	523	220	17
1936	5	7680	2059	1292	281	1936	4	8157	2733	410	52
1937	5	8752	1756	3439	236	1937	4	23104	2217	1629	142
1938	5	4995	2907	3089	719	1938	4	1836	310	252	10
1939	5	3333	2225	1377	189	1939	4	1287	682	178	
1940	5	3041	1432	2624	413	1940	4	1158	542	757	39
1941	5	4931	2429	1537	983	1941	5	2339	540	302	43
1942	5	3882	1837	1868	270	1942	4	2927	822	368	319
1943	5	9842	2932	3503	323	1943	4	11055	2428	1730	590
1944	5	9436	2854	1868	221	1944	4	2524	1004	543	371
1945	5	4751	3552	2759	542	1945	4	3584	1426	434	283
1946	5	3905	1858	1256	631	1946	4	15833	4894	674	267
1947	5	3142	1944	1825	243	1947	4	7596	3776	2079	1975
1948	5	4423	3131	1580	566	1948	4	6423	2073	1202	1714
1949	5	4294	2942	2160	732	1949	4	7894	1432	453	84
1950	5	3124	2453	1500	240	1950	4	4608	2056	1037	1681
1951	5	4145	2653	2231	455	1951	4	2701	1163	768	574
1952	5	4345	3102	2368	74	1952	4	5916	3412	1737	559
1953	5	3830	2859	1308	130	1953	4	11538	2794	1305	707
1954	5	1755	1580	559	640	1954	5	4614	1831	542	417
1955	5	2822	798	202	45	1955	4	4717	1732	288	273
1956	5	2566	1186	609	555	1956	5	11272	2013	379	183
1957	5	1684	813	256	193	1957	4	3669	835	219	173
1958	5	3236	1269	89	181	1958	4	838	209	58	11
1959	5	1977	798	119	118	1959	4	3222	612	57	4936
1960	5	5058	332	245	42	1960	4	3271	172	41	3655
1961	5	4629	1011	118	114	1961	4	5273	330	66	26
1962	5	2970	371	175	29	1962	4	1445	78	11	666
1963	5	1416	454	169	4	1963	4	871	60	15	260
1964	5	519	144	46	53	1964	4	1687	56	19	9211
1965	5	250	187	6	4	1965	4	217	97	8	36
1966	3					1966	3	30	3	8	3
1967	3	313	110	1	27	1967	2	1033	150	3	5
1968	2	105	7	1		1968	2	279	28		8
1969	2	32	5		30	1969	2	1825	31	4	2116
1970	2					1970	2	1			117
1971						1971	1				1
1972						1972	1	1			4846

Table 4. Recovered information on the number of active traps and catches in number, by commercial category, of bluefin tuna by the Portuguese tuna traps from 1896 to 1972, during the incoming (May-June) and return (July-August) seasons.

GBYP Data Recovery Plan on Historical bluefin tuna (Call for Tenders, Circular n. 320/2011)

Total						
Year	Nb Traps	Atum > 90 kg	Atuarro (50-90 kg)	Albacora (30-50 kg)	Cachorreta (<30kg)	Total
1896	15	52001	9099	1361		62461
1897	16	66806	10039	3333		80178
1898	18	56569	8540	8500		73609
1899	18	58617	14397	2770		75784
1900	16	43032	13112	4307		60451
1901	17	41244	12062	4341		57647
1902	18	28679	20496	5396		54571
1903	19	54744	23104	17769		95617
1904	18	46459	19684	1516		67659
1905	17	68904	2457	1694		73055
1906	16	84030	7809	838		92677
1907	16	38471	5531	783	519	45304
1908	16	31294	8098	1904	1577	42873
1909	16	22501	9874	3665	2531	38571
1910	14	16739	5035	3442	4680	29896
1911	13	19373	4405	3509	656	27943
1912	13	19162	7231	3413	248	30054
1913	12	34718	6746	2504		43968
1914	13	42041	5527	2306		49874
1915	13	41440	4360	1863	22	47685
1916	13	11274	2488	544	91	14397
1917	13	19756	4231	2644	117	26748
1918	11	6440	1938	861	506	9745
1919	10	11124	2250	1358	327	15059
1920	9	20870	2689	4820	1141	29520
1921	8	12237	1769	954	120	15080
1922	7	6512	1876	1890	593	10871
1923	7	7956	1178	640	913	10687
1924	7	9994	2100	379	158	12631
1925	7	5880	1059	728	464	8131
1926	7	6379	1031	551	3059	11020
1927	6	18251	638	6	4	18899
1928	6	22636	1523	451	156	24766
1929	6	9801	2950	563	402	13716
1930	6	14148	1824	480	69	16521
1931	6	16059	2859	1068	259	20245
1932	6	13969	905	638	149	15661
1933	6	15886	1842	1373	515	19616
1934	6	6958	874	571	361	8764
1935	6	8356	2841	1196	194	12587
1936	6	23032	4822	2460	395	30709
1937	6	31856	3973	5068	378	41275
1938	5	6831	3217	3341	729	14118
1939	5	4620	2907	1555	189	9271
1940	5	4199	1974	3381	452	10006
1941	5	7270	2969	1839	1026	13104
1942	5	6809	2659	2236	589	12293
1943	5	20897	5360	5233	913	32403
1944	5	12018	3919	2475	592	19004
1945	5	8423	5018	3226	894	17561
1946	5	19738	6752	1930	898	29318
1947	5	10738	5720	3904	2218	22580
1948	5	10846	5204	2782	2280	21112
1949	5	12188	4374	2613	816	19991
1950	5	7732	4509	2537	1921	16699
1951	5	6846	3816	2999	1029	14690
1952	5	10261	6514	4105	633	21513
1953	5	15368	5653	2613	837	24471
1954	5	6369	3411	1101	1057	11938
1955	5	7539	2530	490	318	10877
1956	5	13838	3199	988	738	18763
1957	5	5353	1648	475	366	7842
1958	5	4074	1478	147	192	5891
1959	5	5199	1410	176	5054	11839
1960	5	8329	504	286	3697	12816
1961	5	9902	1341	184	3864	15291
1962	5	4490	449	186	695	5820
1963	5	2287	514	184	264	3249
1964	5	2206	200	65	9264	11735
1965	5	497	287	14	40	838
1966	3	30	3	8	3	44
1967	3	1346	260	4	32	1642
1968	2	384	35	1	8	428
1969	2	1857	36	4	2146	4043
1970	2	1			117	118
1971	1				1	1
1972	1	1			4846	4847

Table 5. Recovered information on the number of active traps and catches of bluefin tuna in number, by commercial category, by the Portuguese tuna traps from 1896 to 1972.

BFT Category: CC5 (atum: >= 90 kg)						
	Month					
Year	5	6	7	8	9	Total
1958	141.3	121.0	148.2	162.8		148.1
1959	194.0	133.0	156.3	139.8		152.0
1960	134.3	127.4	122.6	118.5		127.4
1961	156.0	142.9	141.2	120.8		140.1
1962	145.0	150.0	146.1	142.9		146.5
1963	165.1	151.3	157.2	139.2	175.0	154.4
1964	167.6	166.4	171.1	170.5		169.5
1965	172.6	146.1	153.6	175.5		158.2
1966	137.0	137.6	155.6	157.9		149.8
1967	149.4	163.5	149.0	153.8		152.2
1968	123.0	173.3	150.5			158.8
1969		150.5	178.6	166.9	157.0	171.5
1970	380.0	137.4	154.8	120.8		147.7
1972			176.0			176.0
Total	156.3	149.8	159.0	154.0	169.0	155.2

BFT Category: CC4 (atuarro: 50>= X < 90 kg)						
	Month					
Year	5	6	7	8	9	Total
1958		80.0	87.0	94.0	85.8	89.1
1959		88.0	72.5	79.3	71.4	76.2
1960		69.3	74.0	78.3	79.7	75.2
1961		65.0	65.2	61.2	66.2	64.3
1962		72.1	60.0	63.6	73.8	68.4
1963		65.3	63.5	69.3	68.3	65.7
1964	53.0	69.0	62.7	72.0	71.0	68.1
1965		71.0	75.3	71.2	66.3	71.7
1966		71.0	64.2	68.2	73.6	67.9
1967		69.5	71.6	72.5	74.6	71.7
1968			73.0	83.5		77.2
1969			69.0	57.0	69.7	66.6
1970			72.5	82.2		79.4
Total	53.0	69.9	67.9	71.4	71.5	70.2

BFT Category: CC3 (albacora: 30>= X < 50 kg)						
	Month					
Year	5	6	7	8	9	Total
1958			53.0	56.0		54.0
1959	51.0	34.7	45.0	41.8		41.8
1960	46.3	47.5	52.3			48.9
1961	41.0	47.0	58.0			45.8
1962	41.7	38.8				40.6
1963	42.4	39.2	48.0	31.0		39.8
1964	40.0	40.5	44.4			42.4
1965	42.0	38.0		41.5		41.0
1966	45.0	46.8	42.3	42.0		44.4
1967		49.0				49.0
1968	30.0					30.0
Total	42.8	41.7	47.4	41.1		43.2

Table 6. Monthly mean weights for 3 commercial categories of bluefin tuna caught in the traps of southern Portugal

GBYP Data Recovery Plan on Historical bluefin tuna (Call for Tenders, Circular n. 320/2011)

Year	CC5 Atum>90kg	CC4 Atuarro 50-90kg	CC3 Albacora 30-49kg	CC2 Cachorreta <30kg	Total
1896	7,800,150	636,930	54,440	0	8,491,520
1897	10,020,900	702,730	133,320	0	10,856,950
1898	8,485,350	597,800	340,000	0	9,423,150
1899	8,792,550	1,007,790	110,800	0	9,911,140
1900	6,454,800	917,840	172,280	0	7,544,920
1901	6,186,600	844,340	173,640	0	7,204,580
1902	4,301,850	54,880	0	0	4,356,730
1903	8,211,600	1,617,280	710,760	0	10,539,640
1904	6,968,850	1,377,880	60,640	0	8,407,370
1905	10,335,600	171,990	67,760	0	10,575,350
1906	12,604,500	546,630	33,520	0	13,184,650
1907	5,770,650	387,170	31,320	10,380	6,199,520
1908	4,568,100	566,860	76,160	31,540	5,242,660
1909	3,375,150	691,180	146,600	50,620	4,263,550
1910	2,510,850	352,450	137,320	93,600	3,094,220
1911	2,905,950	308,350	140,360	13,120	3,367,780
1912	2,874,300	506,170	136,520	4,960	3,521,950
1913	5,207,700	472,220	100,160	0	5,780,080
1914	6,306,150	1,157,520	92,280	40	7,555,990
1915	5,730,300	305,200	74,520	440	6,110,460
1916	1,627,200	174,160	21,760	1,820	1,824,940
1917	2,755,950	296,170	105,760	2,340	3,160,220
1918	954,000	135,660	34,440	10,120	1,134,220
1919	1,601,550	157,500	54,320	6,540	1,819,910
1920	2,981,400	188,230	192,800	22,820	3,385,250
1921	1,628,700	123,830	38,160	2,400	1,793,090
1922	886,350	131,320	75,600	11,860	1,105,130
1923	1,176,450	82,460	25,600	18,260	1,302,770
1924	1,231,800	147,000	15,160	3,160	1,397,120
1925	737,700	74,130	29,120	9,280	850,230
1926	884,250	72,170	22,040	61,180	1,039,640
1927	2,289,750	44,660	240	80	2,334,730
1928	3,132,450	106,610	18,040	3,120	3,260,220
1929	1,320,300	206,500	22,520	8,040	1,557,360
1930	1,939,200	127,680	19,200	1,380	2,087,460
1931	1,768,050	200,130	42,720	5,180	2,016,080
1932	2,095,350	63,350	25,520	2,980	2,187,200
1933	2,009,850	109,130	40,560	6,040	2,165,580
1934	1,002,900	61,180	22,840	4,100	1,091,020
1935	1,253,400	198,870	47,840	3,880	1,503,990
1936	3,454,800	337,540	98,400	7,900	3,898,640
1937	3,220,050	203,560	170,840	6,440	3,600,890
1938	1,024,650	225,190	133,640	14,580	1,398,060
1939	693,000	203,490	62,200	3,780	962,470
1940	629,850	138,180	135,240	9,040	912,310
1941	1,090,500	207,830	73,560	20,520	1,392,410
1942	1,021,350	186,130	89,440	11,780	1,308,700
1943	3,134,550	375,200	209,320	18,260	3,737,330
1944	1,802,700	274,330	99,000	11,840	2,187,870
1945	1,263,450	351,260	129,040	17,880	1,761,630
1946	2,960,700	472,640	77,200	17,960	3,528,500
1947	1,610,700	400,400	156,160	44,360	2,211,620
1948	1,626,900	364,280	111,280	45,600	2,148,060
1949	1,828,200	306,180	104,520	16,320	2,255,220
1950	1,159,800	315,630	101,480	38,420	1,615,330
1951	1,026,900	267,120	119,960	20,580	1,434,560
1952	1,539,150	455,980	164,200	12,660	2,171,990
1953	2,305,200	395,710	104,520	16,740	2,822,170
1954	955,350	238,770	44,040	21,140	1,259,300
1955	1,130,850	177,100	19,600	6,360	1,333,910
1956	2,075,700	223,930	39,520	14,760	2,353,910
1957	802,950	115,360	19,000	7,320	944,630
1958	611,100	103,460	5,880	3,840	724,280
1959	779,850	98,700	7,040	101,080	986,670
1960	1,249,350	35,280	11,440	73,940	1,370,010
1961	1,393,650	93,940	7,360	77,280	1,572,230
1962	673,500	31,360	7,440	13,900	726,200
1963	343,500	35,980	7,360	5,280	392,120
1964	334,350	14,000	2,600	186,860	537,810
1965	74,850	20,090	880	860	96,680
1966	143,250	15,890	1,560	40,120	200,820
1967	203,850	18,760	160	640	223,410
1968	57,600	2,450	40	160	60,250
1969	284,400	4,620	320	91,300	380,640
1970	23,400	630	0	7,280	31,310
1971		0	0	20	20
1972	176	0	0	11,371	11,547

Table 7. Estimated catches, in weight (kg) by commercial categories, of the Bluefin tuna caught by the traps of southern Portugal.



Figure 1. Bluefin annual mean weight, by fishing season, in the Portuguese traps (D: May/June; R: July/August)

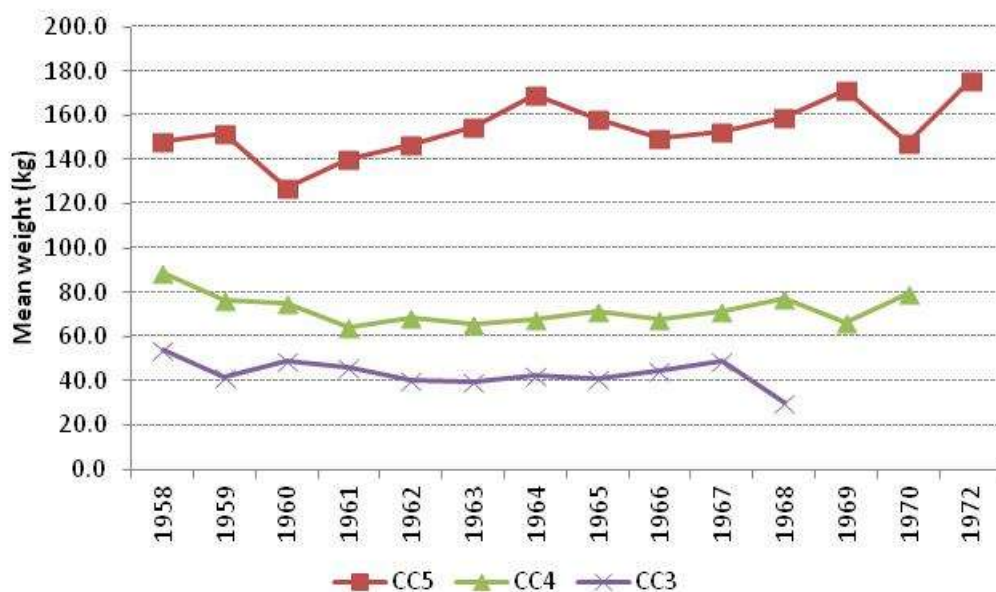


Figure 2. Bluefin annual mean weight, by commercial category, in the Portuguese traps from 1958 to 1972 (CC5: atum > 90 kg; CC4: atuarro: 50 >= X < 90 kg; CC3: albacora: 30 >= X < 50 kg)

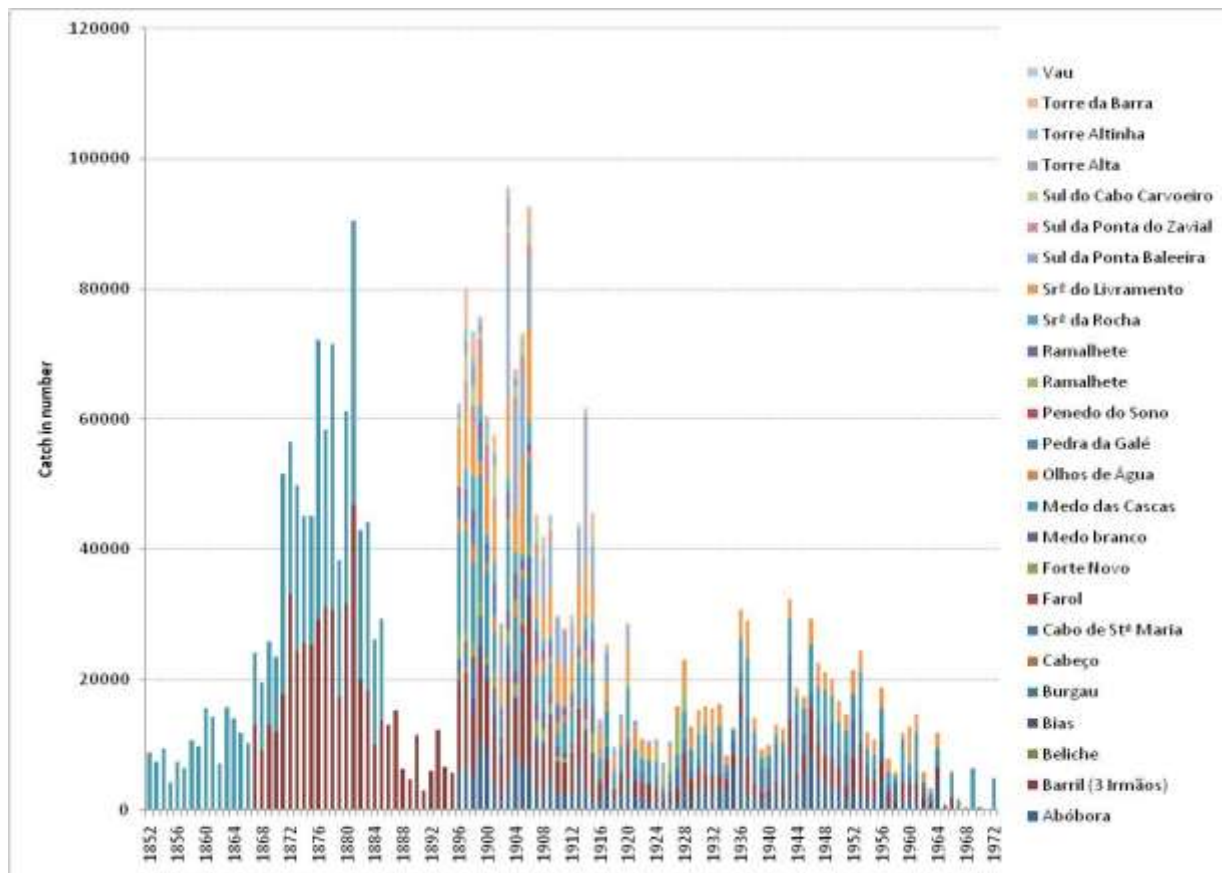


Figure 3. Annual bluefin tuna catches in southern Portugal traps (number of fish)

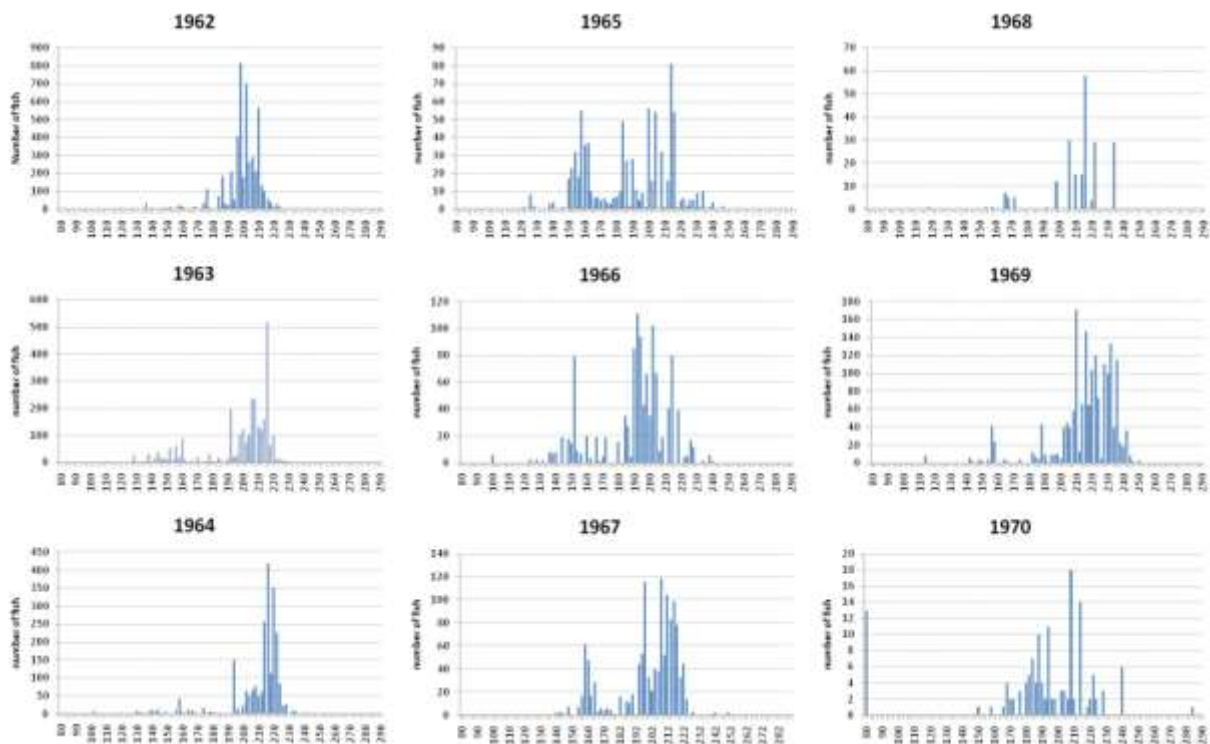


Figure 4. Size frequencies of Bluefin tuna caught in the Portuguese traps from 1962 to 1970

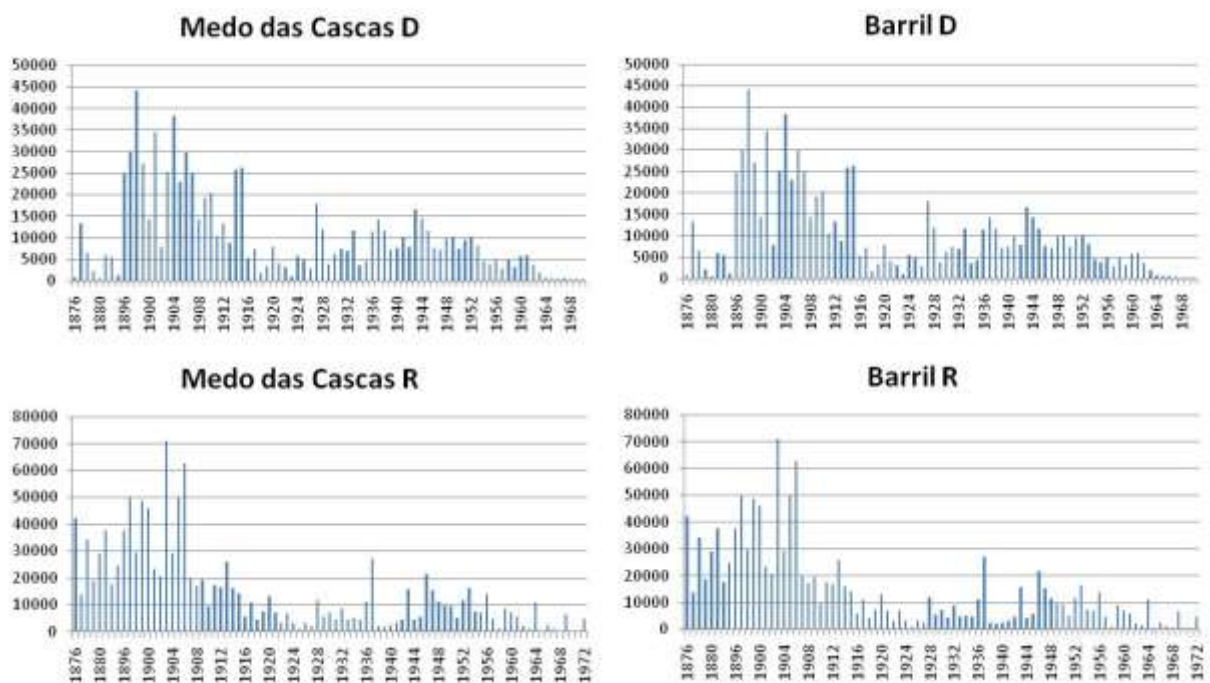


Figure 5. Bluefin tuna catches by season (in number of fish), in 2 Portuguese tuna traps.

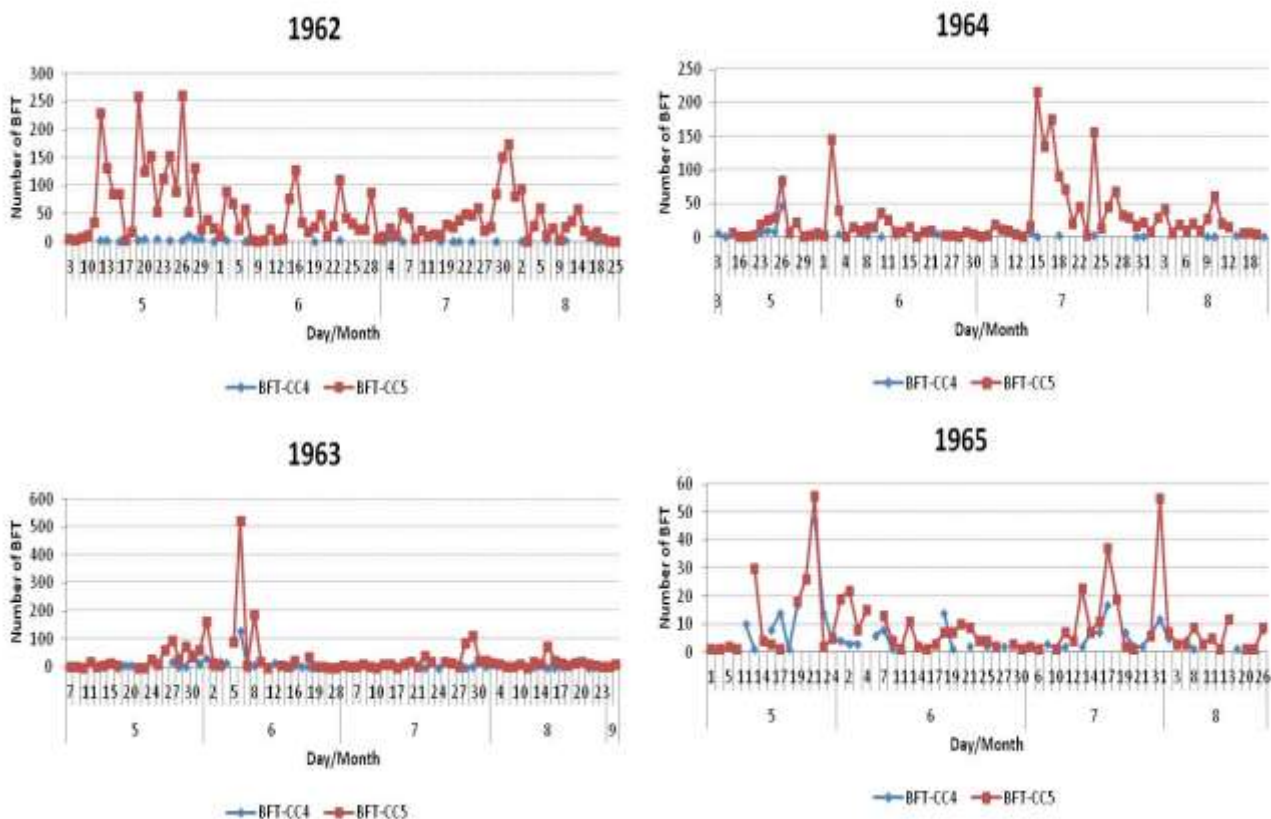


Figure 6. Daily catches of bluefin tuna (in number of fish), of 2 commercial categories (CC5: atum > 90 kg; CC4: atuarro: >50 < 90 kg), in 5 Portuguese tuna traps, from 1962 to 1965.

Annex 1:

Portuguese imports of Bluefin tuna from Moroccan traps

Annex: BFT imported from Morocco

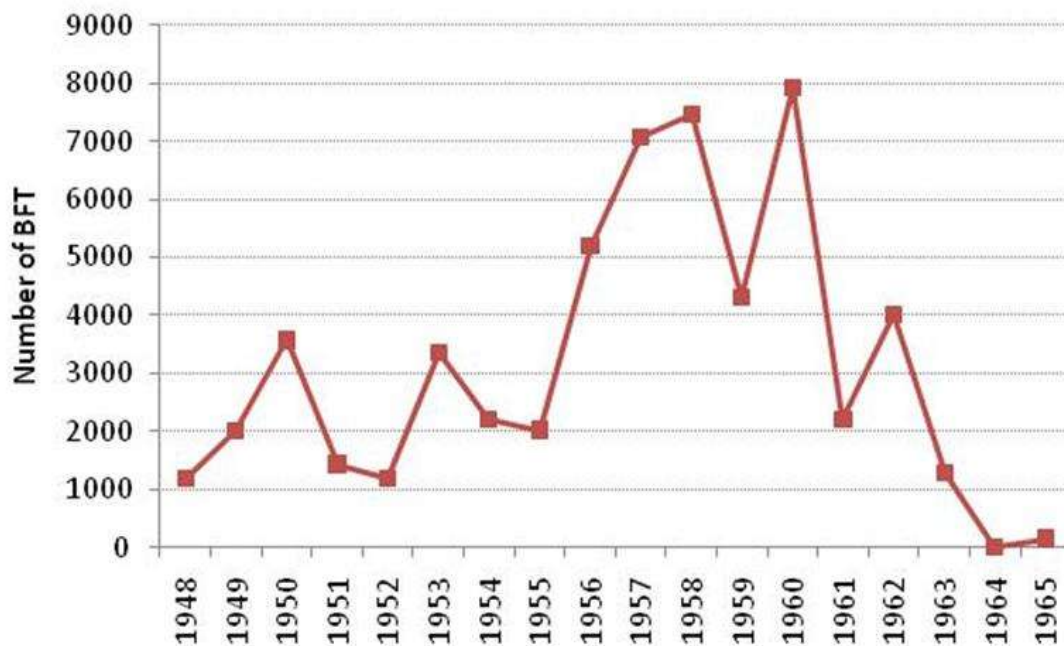
Bluefin Tuna imported from Marrocco (Traps)			
Year	n°	weight (t)	mean w (kg)
1948	1191	210000	176.3
1949	2000	360000	180.0
1950	3575	660000	184.6
1951	1433	250000	174.5
1952	1180	210000	178.0
1953	3364	600000	178.4
1954	2209	400000	181.1
1955	2025	360000	177.8
1956	5200	970000	186.5
1957	7059	1270000	179.9
1958	7469	1383000	185.2
1959	4312	810000	187.8
1960	7927	1408119	177.6
1961	2200	395431	179.7
1962	4024	744130	184.9
1963	1277	244341	191.3
1964	0		
1965	150	56000	373.3

Annex 1: Table 1. Portuguese imports of BFT from Moroccan traps

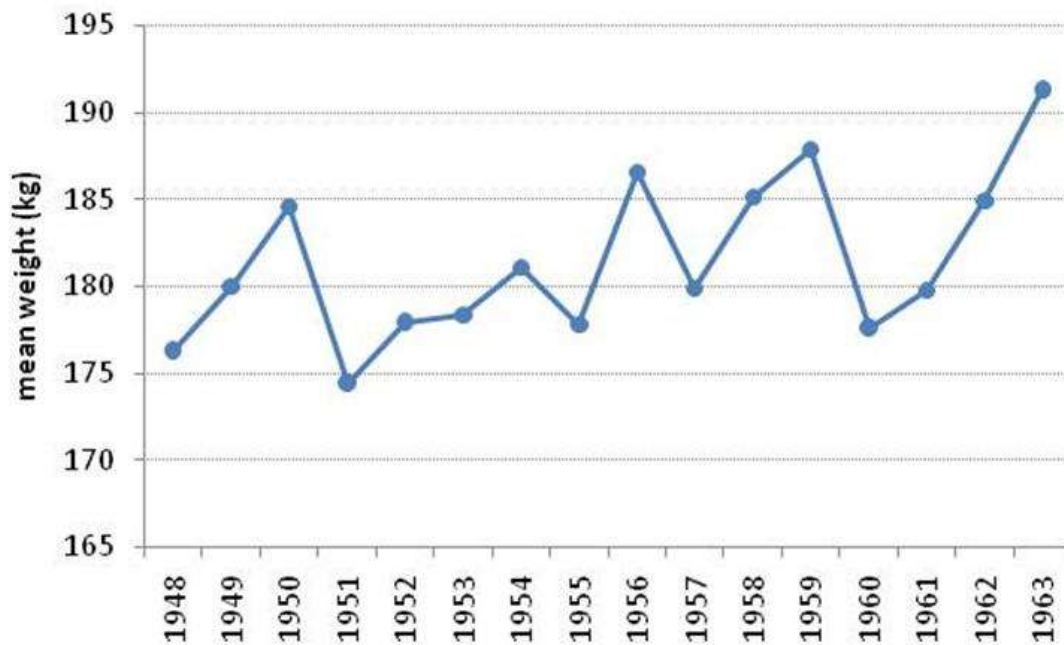
Bluefin Tuna imported from Marrocco (Traps)			
Year	n	w (kg)	mean w
1960	844	148143	175.5
1960	1686	297264	176.3
1960	912	161104	176.6
1960	1596	284585	178.3
1960	882	154079	174.7
1960	1291	232503	180.1
1960	536	98210	183.2
1960	130	22011	169.3
1960	50	10220	204.4
1961	529	93892	177.5
1961	500	93968	187.9
1961	283	50768	179.4
1961	289	51492	178.2
1961	319	54956	172.3
1961	209	37450	179.2
1961	71	12905	181.8
1962	1019	185609	182.1
1962	668	121943	182.5
1962	513	96760	188.6
1962	686	130357	190.0
1962	550	103318	187.9
1962	468	84782	181.2
1962	120	21361	178.0
1963	294	56631	192.6
1963	296	55989	189.2
1963	147	29173	198.5
1963	150	28355	189.0
1963	296	56868	192.1
1963	25	4612	184.5
1963	69	12713	184.2

Annex 1: Table 2. Portuguese imports of BFT from Moroccan traps

Annex: BFT imported from Morocco



Annex 1: Figure 1. Total annual Portuguese imports of BFT from Moroccan traps



Annex 1: Figure 2. Annual mean weights of Portuguese imports of BFT from Moroccan traps