

**PRELIMINARY EVALUATION OF THE TOTAL CATCHES
OF EASTERN BLUEFIN TUNA: A COMPARISON OF THE GBYP AND ICCAT
TASK I DATABASES (1950-2011)**

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SUMMARY

The data recovery and data mining is one of the main tasks of ICCAT-GBYP and, within this work, a large amount of data previously not included in the ICCAT BFT data base have been recovered. A review work was carried out on GBYP Task I data and a few conflicts with the ICCAT Task I data have been noticed. According to the ICCAT data rules, these conflicts must be examined and resolved by the competent CPC and its national scientists, providing the final decision to ICCAT.

RÉSUMÉ

La récupération des données et l'exploration des données constituent l'une des principales tâches de l'ICCAT-GBYP et, dans le cadre de ces travaux, un grand volume de données qui n'étaient pas encore incluses dans la base de données de l'ICCAT sur le thon rouge ont été récupérées. Un examen des données de la Tâche I du GBYP a été réalisé et l'on a constaté quelques contradictions avec les données de la Tâche I de l'ICCAT. Selon les normes de l'ICCAT en matière de données, ces contradictions doivent être examinées et résolues par la CPC compétente et ses scientifiques nationaux, en présentant la décision finale à l'ICCAT.

RESUMEN

La minería y recuperación de datos es una de las principales tareas del ICCAT-GBYP y, en el marco de este trabajo, se ha recuperado una gran cantidad de datos que antes no estaban disponibles en la base de datos de atún rojo de ICCAT. Se realizó una comparación de los datos de captura recuperados del GBYP y se detectaron algunos conflictos con los datos de Tarea I de ICCAT. Según las normas sobre datos de ICCAT. Estos conflictos deben ser examinados y resueltos por las CPC competentes y sus científicos, que deben facilitar una decisión final a ICCAT.

KEYWORDS

Bluefin tuna, Catch statistics, Task I, GBYP

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1. Introduction

One of the main objectives of ICCAT GBYP was the data recovery and the data mining, trying to find bluefin tuna data not already included in the ICCAT BFT data base. This work, initiated in 2010, is still going on, but all data recovered in the first three phases of the GBYP have been fully analysed and finely quality checked, with the purpose of avoiding duplications and possible inconsistent data.

GBYP Task II data have been presented in various documents to SCRS BFT Species Group and finally the dedicated Bluefin Tuna Meeting on Biological Parameters Review, held in Tenerife on 7-13 May 2013 (see: http://www.iccat.int/Documents/Meetings/Docs/2013-BFT_BIO_ENG.pdf), used them and concluded the following (page 2):

- For the Task II size data the Group considered that the methods used to validate those data have been appropriate and agreed to incorporate these data to the ICCAT data bases.
- As regards Task II catch and effort series that fill gaps in ICCAT current data base, once the quality checking is passed, be incorporated in the ICCAT data base.

GBYP Task II data were fully analysed, quality controlled and cross-checked with the ICCAT BFT data base (see documents SCRS/2012/116, SCRS/2012/141 and SCRS/2013/073) and now can be officially incorporated in the ICCAT data base and used by SCRS.

Following the recommendations from the SCRS Bluefin tuna Working Group, this document summarizes a comparison of the total catches for eastern bluefin tuna stock as reported by Task I and the data collected from “data recovery and mining” projects under the Atlantic-wide research program on Bluefin tuna (ICCAT-GBYP) for the 1950 – 2011 period.

Task I data recovered by GBYP for the period before 1950 can be included in the ICCAT BFT data base.

The document identifies overlaps between catch and effort data series compiled under the GBYP and data series included in the ICCAT databases, examines potential duplicate reporting and highlights items or data that would require further clarification by national scientists. The objective is to present to the Bluefin WG a detailed report in order to facilitate the decision of what data will be incorporated to the ICCAT database for future evaluations.

2. Data

Two databases were compared in this work, the Task I ICCAT database (as of July 2013) and the GBYP catch and effort database for the East Atlantic and Mediterranean Bluefin tuna stocks.

The ICCAT Task I database contains the official information for Nominal annual catch by species, region, gear, flag, and where possible, separated between EEZ and High Seas submitted by the responsible CPCs. Total annual catches (tons) by reporting flag were extracted from the ICCAT Task I data base for years after 1950.

The Atlantic-wide research program for bluefin tuna (ICCAT-GBYP) formally started from October 2009, but the coordination activity started in March 2010; the first phase included, among other issues, data mining and data recovery activities. The second phase of GBYP started in December 2010, including (a) continuation of data mining/recovery and data elaboration, (b) continuation of aerial surveys on spawning aggregations, (c) biological and genetic sampling and analyses, (d) conventional tagging, including awareness and rewarding campaign, and (e) first steps of the modeling approaches. This work will refer exclusively to the historical data recovered up to the end of Phase 3. **Table 1** shows a brief description of the database, including time range covered, a list of contractors involved in recovery activities and fishing areas studied. As regards the Catch and Effort database built during the data mining/recovery and elaboration process, it contains information for a total of 30,923 trap fishing operations (matanzas) and 87,761 fishing operations carried out using other gears. Of the total amount of records, 56.7% (67,332 records) describe fishing operations performed during or after 1950.

In the request for proposals of the GBYP “data recovery and mining”, it was demanded that any catch and effort of bluefin tuna data submitted had NOT been previously reported to ICCAT. A catalog of the data available at the ICCAT databases by year, gear and CPC was given each year to interested parties as to identify ‘gaps’ in data that could be filled up by applicants and attached to each Call for tender officially issued by ICCAT.

However, given the very complex nature of the data, sources and disposition, it was not always guaranteed that the data had not been already partially or totally included in the official national reports, hence the analysis presented in this document.

3. Methods

How to evaluate the data provided and confirm that they have not been reported totally or partially already under the official CPC statistics is by no means an easy task; bearing in mind that we don't have local knowledge or expertise from where the data originated, neither the procedures by which catch statistics are compiled to create official Task I reports. Therefore, the approach taken in these preliminary analyses was to find the 'overlaps' of GBYP data with the current Task I by year, flag and gear type and identify "potential" duplicated data, meaning data that could have already been reported in Task I to ICCAT by the national authorities.

In this situation we can draw the possible scenarios as a matrix and evaluate each cell for their likelihood or requirements needed to assess which case has a higher probability.

1. The GBYP catches (flag/gear/year) are less or same as Task I and
 - 1.1. All catch was already reported by CPC in Task I
 - 1.2. Partial catch were reported by CPC in Task I
 - 1.3. None of the catch was reported by CPC in Task I
2. The GBYP catches (flag/gear/year) are higher than Task I and
 - 2.1. All catch was reported by CPC. *NOT possible*
 - 2.2. Partial catch were reported by CPC.
 - 2.3. None of the catch was reported by CPC

From the matrix above, case (2.1) is the only one we can directly discard or ignore. For the situations where the GBYP catch is less or similar to Task I, to evaluate any of the 3 scenarios (1.1, 1.2, 1.3) it would be necessary to have further detailed information to discriminate among cases, for example, details of the catch by trap (or vessel), date, size composition, etc. Moreover, this information should be available in both the GBYP data and Task I. Unfortunately, Task I doesn't have that level of information, and the level of information in GBYP data varies greatly between the different provider sources.

From a point of view of the scientific evaluation of the stock, the important cases would be 1.2 and 1.3, because in those situations those catches should be added to the current Task I. However, we don't have most of the elements to discriminate among cases 1. Thus, in principle we assumed that if the GBYP catch was less or the same than Task I by flag/gear/year, those catches were already reported by the CPC and thus shouldn't be added to the Task I unless proved otherwise. This proof would require a detailed work among CPC scientists fully familiar with the catch statistical compilation processes to verify what component of the GBYP catch should correspond to 1.1, 1.2 or 1.3. It is to be considered that in some years variable quantities of Task I catch data have been reported by some CPCs as obtained from "unclassified" (UNCL) gear and then the simple comparison between Task I data for a specific gear sometimes may not provide a clear overlapping.

In the case 2, where GBYP catches are higher than those reported in Task I, any decision would clearly have more relevance for the evaluation of the resource. The exercise, again for distinguishing between 2.2 and 2.3 required more detailed and/or auxiliary information. By default, we assumed that none of the catch has been reported (2.3) and therefore it should be added to the Task I, at least proved otherwise, as before then we deferred this task to the CPC scientist.

In synthesis, then we focused on the GBYP catches by flag, year, gear that were higher than Task I. Furthermore, the following criterion was adopted to discriminate relevant differences between the two data sources (Task I and GBYP): those years when for a given Flag and Gear, data recovered under the GBYP showed a total annual catch at least 10% higher than that recorded in the ICCAT database were identified and studied separately. Comparison started with the catalogs showing annual catches (tons) grouped by Year, Flag and Gear (**Tables 2-3**) for the Eastern Atlantic and Mediterranean Sea areas.

In some of the GBYP data, it was identified that the same catches from Flag, gear, year were obtained from two or more different sources or projects. In these situations further verifications were conducted to rule out the possibility of duplicates. Although this kind of data control check had already been performed in all GBYP data, it was considered necessary to repeat it for the data series identified in the next chapter.

4. Results

The Flag-Gear overlaps found in the catalog where ICCAT and GBYP data were compared are shown in **Table 4**. Senegal was the only case in which only GBYP data was available, with no Task I data to compare it with (SCRS/2010/113). For each of these cases, all data were plotted (**Figures 1 and 2**) and the 10% over criterion was applied (**Table 5**).

As regards the Eastern Atlantic area, significant differences were found for the following Flag-Fleet-Gear combinations: Spanish Baitboats (39 years between 1950 and 1995), Spanish traps (22 years between 1956 and 2006), Moroccan traps (year 2001) and Portuguese traps (years 1962 to 1969).

Concerning Spanish Baitboats, the total catches include both fleets from the Cantabrian Sea and the Canary Islands.

Concerning Moroccan traps, GBYP catch only seemed significantly different for the year 2001; thus, it was not considered necessary to do any further analysis of this dataset (**Table 6**).

As regards the Mediterranean Sea, significant differences were found for the following Flag Fleet-Gear combinations: Spanish traps (17 years between 1956 and 2002), Italian longline (year 1998) and Italian handline (year 1999). For the Italian longline and Italian handline, further analyses were also disregarded (**Table 7**).

4.1. Detailed revision of selected GBYP datasets

4.1.1. Spanish baitboat

The information for catches in this dataset originated from two different Spanish sources: Instituto Español de Oceanografía (IEO) and AZTI- Tecnalia. Most data provided by each source correspond to different areas or harbours, except for those of Lekeitio and Ondarroa, for which both contracting parties supplied catch information.

Two major reasons made it difficult to compare these datasets. Firstly, each source provided data for different catch time periods: for Lekeitio, IEO provided catches aggregated by month, whereas AZTI supplied daily data (**Figure 3**). Catches in Ondarribia were reported by IEO grouped by month for most periods, but also annual catches were reported in some cases. However, all AZTI data for this area was reported as daily operations, similarly to how data were reported for Lekeitio (**Figure 4**). Secondly, while AZTI identified all vessels by a coded ID number, IEO did not supply any identification for the vessels involved in each fishing operation.

A first discussion between the data providers took place during the Bluefin Tuna Species Group in 2012, but it was not conclusive and no definitive agreement was reached.

Looking at **Figures 3 and 4** it may seem like some of the data are duplicated given the similarity in catches trends for some periods; nevertheless, taking into account the two issues discussed above, there is not enough information to confirm that assumption.

4.1.2. Portuguese traps

All information available for Portuguese traps in the GBYP database were provided by the University of Açores, therefore, the possibility of duplicated data from different sources was ruled out. In terms of trap identification, it was noted that in all years with data reported in more than one catch time period, there was at least one trap listed as “unknown”, preventing a 100% accurate discrimination of potential duplicates (**Table 8**). This issue was present between 1962 and 1970, where information exists for both annual and daily catches (**Figure 5**). Daily catches could be part of the whole annual catch reported for each of these years, although, the real annual catch could actually be the sum of the quantities reported as daily and annual catches together. Once again, there is no final evidence to prove which of these scenarios is true.

4.1.3. Spanish traps (East Atlantic and Mediterranean Sea)

There are no reasons to suspect any of the Spanish traps datasets contain duplicated information: there is only one source for each dataset (IEO), information is reported solely for one catch time period (annual catches) and all traps are adequately identified (**Tables 9-10** and **Figures 6-7**).

5. Discussion

After studying total catches for eastern bluefin tuna stock from ICCAT Task I database and GBYP data recovery activities database for the time period between 1950 and 2011, several conclusions can be drawn.

For one, it is clear that with the information available and the way in which it is reported, accurate comparisons between these two databases is not always feasible, because details are sometimes missing.

In reference to the matrix of possible cases described in this document, the following approaches are suggested:

- a) For cases 1.1, 1.2 and 1.3, where catches reported under the GBYP are lower or equal to those registered in the Task I database, GBYP catch data should not be included in the Task I database, unless it is precisely proven that data reported to the GBYP programme are different from those data stored as Task I.
- b) For cases where catch and effort data collected during GBYP data recovery activities are higher than those included in the Task I database, a thorough examination of these data must be performed by national scientists familiar with the way Task I data are elaborated and by contracting parties who supplied this kind of data to the GBYP programme. However, it is suggested that the GBYP catch data should be added or replace the Task I database, with a note of caution for same flag-gear GBYP data reported by two different contractors. Communication between these two parties would also be beneficial in order to clarify which data series would be allocated as case 2.2 (partial GBYP catch information was already reported by the CPC) or as case 2.3 (none of the catch reported to GBYP was previously reported by the CPC).

As indicated above, in cases where two contractors submitted catch and effort data series to the GBYP programme for the same area and fishing gear², it is strongly recommended that said sources discuss whether the information they submitted to ICCAT might be duplicated or not (See section 4.1.1).

Furthermore, we would request a revision of all data series studied in section 4 of this work by the entities who submitted these data as part of the GBYP programme in order to rule out any duplication. Some initial reviews and discussions have already been started in prior meetings. These revisions and discussions should continue and include an exhaustive study of those data series where data for the same area and fishing gear are grouped in more than one catch time period (daily, monthly and/or annually).

At the same time, special attention should be given to datasets where fishing gears are listed as “unknown”, because it is absolutely necessary to be able to know whether catches corresponding to these “unknown” gears are different from those corresponding to identified gears or not (See section 4.1.2).

Regarding section 4.1.3, although apparently no information is duplicated, we request a revision of these data to confirm that the comparison made between GBYP data and Task I data is reliable.

Once all these aspects are assessed, the situation should be much clearer and further steps in the process of integrating these specific GBYP Catch and effort data to ICCAT Task I database will be defined and put into practice, with an overall improvement in the Eastern Atlantic and Mediterranean BFT stock assessment as a result. **Figure 8** shows the estimated total removals for eastern bluefin tuna if the proposed catches from the GBYP data are added to the current Task I. Most of the changes are in the early years of the time series (1952 – 1970). This trend represents the highest quantity, as it does not exclude potential duplicate reports from the GBYP data as mentioned above.

² In some cases the offer of data submitted by GBYP contractors included undefined data sets for large areas or for some fishing gears, because the data details were not easily detectable in advance. In several cases, data sets were finally identified only when the contractor carried out the work. Sometimes data from the same port were found by two different contractors in different archives, presented in different formats.

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Table 1. Summary table describing the GBYP data recovered database.

Vessel-based gears	Traps
<i>Number of records</i> 87761	<i>Number of records</i> 30923
<i>Time range</i> 1903 - 2010	<i>Time range</i> 1512 - 2009
<i>Contractors</i> AZTI (Spain) IEO (Spain) INRH (Morocco) Institute of Marine Research (Norway) Ministère de l'économie maritime (Senegal) Necton (Italy) Ricerca Mare Pesca (Italy)	<i>Contractors*</i> Dr. Alain Fonteneau (France) IEO (Spain) INRH (Morocco) Progetto Blu (Italy) Ricerca Mare Pesca (Italy) Universidade Açores (Portugal) Dr. Ali Fuat ÖRENÇ
<i>Fishing areas</i> Tyrrhenian Sea Strait of Sicily Ionian Sea Senegal Gibraltar Strait Bay of Biscay Norway	<i>Fishing areas</i> Ionian Sea Ligurian Sea Sardinia Strait of Sicily Tyrrhenian Sea Atlantic Morocco Cadiz Eastern Spain Gibraltar Strait Algarve Madeira Southern Med. Sea

*Some historical trap datasets were donated by the GBYP coordinator.

Table 4. Summary of ICCAT - GBYP overlaps.

East Atlantic		Mediterranean Sea	
EU.España	Baitboat (BB)	EU.España	Trap (TP)
EU.España	Trap (TP)	Maroc	Handline (HL)
Norway	Purse Seiner (PS)	Maroc	Trap (TP)
Maroc	Trap (TP)	EU.Italy	Purse Seiner (PS)
EU.Portugal	Trap (TP)	EU.Italy	Longline (LL)
Senegal*	Baitboat (BB)	EU.Italy	Handline (HL)
		EU.Italy	Gillnet (GN)
		EU.Italy	Harpoon (HP)
		EU.Italy	Trap (TP)

*Only GBYP data, no ICCAT task I to compare with.

Table 5. Years in which the 10% criterion is met (by Stock, Flag and Gear).

Comparison by Year, FlagName and Gear (Years where GBYP total catch is 10% larger than ICCAT task I)

East Atlantic		Mediterranean Sea	
EU.España	BB	EU.España	TP
	1950		1956, 1958-1958
	1952-1971		1962-1963
	1973-1975		1966-1975
	1979-1980		1995, 2002
	1982-1993		(17 years)
	1995	EU.Italy	LL
	(39 years)		1998
EU.España	TP	EU.Italy	HL
	1956-1971		1999
	1973, 1975, 1978		
	1998, 1999, 2006		
	(22 years)		
Maroc	TP		
	2001		
EU.Portugal	TP		
	1962-1969		
	(8 years)		

Table 6. Detail of total annual catch (tons) difference between ICCAT Task I data and data recovered under the GBYP (east Atlantic Ocean). Highlighted years present a difference greater or equal to 10%.

EU.España BB				EU.España TP					
	ICCAT t1	GBYP	difference		ICCAT t1	GBYP	difference		
1950	996.00	1112.13	TO REVIEW	116.13	1950	6764	6724.5	OK	
1951	1086.00	1014.71	OK		1951	4508	3072.1	OK	
1952	1424.00	3453.71	TO REVIEW	2029.71	1952	4858	4562	OK	
1953	1192.00	2649.50	TO REVIEW	1457.50	1953	7750	7164.4	OK	
1954	979.00	3103.83	TO REVIEW	2124.83	1954	6397	6115.9	OK	
1955	1417.00	4355.49	TO REVIEW	2938.49	1955	7242	7146	OK	
1956	1338.00	3471.36	TO REVIEW	2133.36	1956	7744	16439.2	TO REVIEW	8695.2
1957	1604.00	3943.82	TO REVIEW	2339.82	1957	9200	17485.2	TO REVIEW	8285.2
1958	1526.00	3740.07	TO REVIEW	2214.07	1958	8000	16577.5	TO REVIEW	8577.5
1959	1021.00	2598.85	TO REVIEW	1577.85	1959	4800	9269.2	TO REVIEW	4469.2
1960	645.00	2021.90	TO REVIEW	1376.90	1960	5700	10770.4	TO REVIEW	5070.4
1961	546.00	1219.63	TO REVIEW	673.63	1961	4700	9008.9	TO REVIEW	4308.9
1962	572.00	1057.86	TO REVIEW	485.86	1962	4700	7588.8	TO REVIEW	2888.8
1963	635.00	1292.88	TO REVIEW	657.88	1963	1800	3645.8	TO REVIEW	1845.8
1964	676.00	1276.96	TO REVIEW	600.96	1964	2500	4755.3	TO REVIEW	2255.3
1965	1199.00	1745.09	TO REVIEW	546.09	1965	3200	6031.4	TO REVIEW	2831.4
1966	1723.00	2545.64	TO REVIEW	822.64	1966	1400	2764.5	TO REVIEW	1364.5
1967	945.00	1411.41	TO REVIEW	466.41	1967	3000	5953.1	TO REVIEW	2953.1
1968	1084.00	1438.68	TO REVIEW	354.68	1968	1100	2506.9	TO REVIEW	1406.9
1969	1292.00	2044.25	TO REVIEW	752.25	1969	1900	3247.5	TO REVIEW	1347.5
1970	2285.00	2827.04	TO REVIEW	542.04	1970	1500	2952.6	TO REVIEW	1452.6
1971	2375.00	2990.61	TO REVIEW	615.61	1971	600	1223.1	TO REVIEW	623.1
1972	2292.00	2469.46	OK		1972	250	57.2	OK	
1973	2602.00	3313.72	TO REVIEW	711.72	1973	504	867.4	TO REVIEW	363.4
1974	1635.00	2216.64	TO REVIEW	581.64	1974	13	4	OK	
1975	1923.45	2186.88	TO REVIEW	263.43	1975	448	893.2	TO REVIEW	445.2
1976	1418.75	1404.05	OK		1976	490	490.24	OK	
1977	2207.32	2282.11	OK		1977	339	339.217	OK	
1978	2813.81	3089.28	OK		1978	450	633.4	TO REVIEW	183.4
1979	1748.85	2219.74	TO REVIEW	470.89	1979	600	586.8	OK	
1980	1215.41	1888.12	TO REVIEW	672.71	1980	700	662.5	OK	
1981	952.35	965.42	OK		1981	787		OK	
1982	650.63	820.07	TO REVIEW	169.43	1982	1916		OK	
1983	1419.37	2642.87	TO REVIEW	1223.50	1983	1862		OK	
1984	1679.81	2725.64	TO REVIEW	1045.83	1984	2271		OK	
1985	1620.53	1887.12	TO REVIEW	266.58	1985	1630	1630.318	OK	
1986	1113.78	2004.01	TO REVIEW	890.23	1986	891	735.233	OK	
1987	1229.78	1577.59	TO REVIEW	347.81	1987	939	939.053	OK	
1988	1427.89	2269.17	TO REVIEW	841.28	1988	2389	2389.003	OK	
1989	1663.55	2203.20	TO REVIEW	539.65	1989	1174	1174.364	OK	
1990	1313.93	1549.07	TO REVIEW	235.14	1990	1911	1910.579	OK	
1991	996.56	1167.18	TO REVIEW	170.62	1991	1040	1040.26	OK	
1992	768.56	1062.13	TO REVIEW	293.56	1992	1271	1271.123	OK	
1993	3281.20	3649.83	TO REVIEW	368.64	1993	1244	1244.373	OK	
1994	1694.24	1363.65	OK		1994	1136	1136.434	OK	
1995	2386.40	2859.64	TO REVIEW	473.24	1995	941	941.162	OK	
1996	4594.55	4789.53	OK		1996	1207	1206.896	OK	
1997	2939.92		OK		1997	2723	2723.227	OK	
1998	2016.61		OK		1998	1525	1975.814	TO REVIEW	450.814
1999	1216.84		OK		1999	2005	3622.689	TO REVIEW	1617.689
2000	1728.58		OK		2000	1416.324	1416.324	OK	
2001	2167.94		OK		2001	1239.9	1239.854	OK	
2002	2410.37		OK		2002	1548.4	1548.448	OK	
2003	1239.39		OK		2003	749.82	749.816	OK	
2004	1735.32		OK		2004	862.44	862.439	OK	
2005	2011.98		OK		2005	880.45	880.446	OK	
2006	1065.13		OK		2006	819.755	947.32	TO REVIEW	127.565
2007	1902.81		OK		2007	1348.322	1348.322	OK	
2008	1726.91		OK		2008	1194.255	1198.487	OK	
2009	1197.42		OK		2009	1209.166		OK	
2010	641.43		OK		2010	887.375		OK	
2011	562.41		OK		2011	901.908		OK	

EU.Portugal TP				
	ICCAT t1	GBYP	difference	
1950	1501	1521.3	OK	
1951	1348	1369.1	OK	
1952	2086	2099.4	OK	
1953	2697	2710.2	OK	
1954	1213	1223.4	OK	
1955	1181	1189.2	OK	
1956	2280	2276.9	OK	
1957	840	848.8	OK	
1958	661	669.8	OK	
1959	883	921.6	OK	
1960	1016	937.1	OK	
1961	1499	1627.8	OK	
1962	666	1940.39	TO REVIEW	1274.39
1963	354	1304.893	TO REVIEW	950.893
1964	303	1267.584	TO REVIEW	964.584
1965	90	515.466	TO REVIEW	425.466
1966	122	314.481	TO REVIEW	192.481
1967	209	423.919	TO REVIEW	214.919
1968	55	302.586	TO REVIEW	247.586
1969	261	828.234	TO REVIEW	567.234
1970		548.681		
1971		0.008		
1972		11.547		
1973				
...				

Maroc TP				
	ICCAT t1	GBYP	difference	
2001	2330.00	2635.80	TO REVIEW	305.80

Table 7. Detail of total annual catch (tons) difference between ICCAT Task I data and data recovered under the GBYP (Mediterranean Sea). Highlighted years present a difference greater or equal to 10%.

EU.España		TP	ICCAT t1	GBYP	difference
1950			168	OK	
1951			273	OK	
1952			553	102.9 OK	
1953			54	7 OK	
1954			597	232 OK	
1955			60	34.6 OK	
1956			136	460.6 TO REVIEW	324.6
1957			345	374 OK	
1958			282	397 TO REVIEW	115
1959			374	422.8 TO REVIEW	48.8
1960			561	562.6 OK	
1961			620	557.8 OK	
1962			377	517.1 TO REVIEW	140.1
1963			472	722.4 TO REVIEW	250.4
1964			653	493.9 OK	
1965			1235	827.3 OK	
1966			151	573 TO REVIEW	422
1967			104	617.6 TO REVIEW	513.6
1968			4	566.6 TO REVIEW	562.6
1969			217	668.2 TO REVIEW	451.2
1970			280	816.7 TO REVIEW	536.7
1971			53	417.5 TO REVIEW	364.5
1972			88	451 TO REVIEW	363
1973			146	746.4 TO REVIEW	600.4
1974			11	383.5 TO REVIEW	372.5
1975			3	534 TO REVIEW	531
1976			3	0 OK	
1977			2	0 OK	
1978			1	0.5 OK	
1979				23.6	
1980					
1981			3	0 OK	
1982			66	30.796 OK	
1983			37	14.64 OK	
1984			621	30.965 OK	
1985			302	301.805 OK	
1986			168	167.996 OK	
1987			219	218.814 OK	
1988			228	227.765 OK	
1989			231	231.216 OK	
1990			470	470.272 OK	
1991			24	23.936 OK	
1992			16	16.49 OK	
1993			6	6.449 OK	
1994					
1995			1	1.279 TO REVIEW	0.279
1996			1	0.83 OK	
1997			1	0.934 OK	
1998			5	4.5 OK	
1999			1	0.623 OK	
2000			0.134	0.134 OK	
2001			0.6	0.587 OK	
2002			0.4	0.441 TO REVIEW	0.041
2003			0.08	0.075 OK	
2004			1.1	1.102 OK	
2005			0.16	0.157 OK	
2006					
2007					
2008					
2009					
2010					
2011					
EU.Italy LL					
			t1	GBYP	difference
			1998	292.00 673.91 TO REVIEW	381.91
EU.Italy HL					
			t1	GBYP	difference
			1999	0.31 0.48 TO REVIEW	0.17

Table 8. Portuguese traps reported to GBYP by University of Açores for years 1962 to 1970.

	1962	1963	1964	1965	1966	1967	1968	1969	1970
annual catches	unknown	unknown	unknown	unknown	unknown	unknown	unknown	unknown	unknown
daily catches	Abóbora	Abóbora	Abóbora	Abóbora					Abóbora
	Barril (3 Irmãos)	Barril (3 Irmãos)	Barril (3 Irmãos)	Barril (3 Irmãos)	Barril (3 Irmãos)				
	Cabo de Santa Maria	Cabo de Santa Maria	Cabo de Santa Maria	Cabo de Santa Maria		Cabo de Santa Maria			
	Srª do Livramento	Srª do Livramento	Srª do Livramento	Srª do Livramento	Srª do Livramento	Srª do Livramento	Srª do Livramento	Srª do Livramento	
	Medo das Cascas	Medo das Cascas	Medo das Cascas	Medo das Cascas	Medo das Cascas	Medo das Cascas	Medo das Cascas	Medo das Cascas	Medo das Cascas

Table 9. Spanish traps (East Atlantic) reported to GBYP by IEO.

AREA	TrapID	TrapName	FlagTrap	Lat	Lon	FishingArea	DataSource
East Atlantic	15*	Las Cabezas	UE.ESP	37.15	-7.35	South-Western Spain	Data source: Buen (1914 e 1920-23); Consorcio Nacional Almadrabeto - Fossi, lettera 19 gennaio 1933 (1924-28)
East Atlantic	16	Punta Umbria	UE.ESP	37.18	-6.97	South-Western Spain	Data source: Consorcio Nacional Almadrabeto - Casimiro Roda, lettera 15 agosto 1934 (1914, 1916-19 e 1931-33); Fossi (1924)
East Atlantic	18*	Nuestra Senora de la Cinta	UE.ESP	37.15	-6.95	South-Western Spain	Data source: Buen (1914-20 e 1923); Consorcio Nacional Almadrabeto - Fossi, lettera 19 gennaio 1933 (1924-28)
East Atlantic	19*	Las Torres	UE.ESP	37.05	-6.72	South-Western Spain	Data source: Emilio Martin Bogarin, lettera 21 novembre 1925 (1902-14, 1918 e 1921); Buen (1915-17, 1919-20 e 1922-23); Parodi (1927 e 1933); Consorcio Nacional Almadrabeto - Casimiro Roda, lettera 15 agosto 1934 (1931-32)
East Atlantic	24	Punta de la Isla	UE.ESP	36.39	-6.24	South-Western Spain	Data source: Buen (1914 e 1917-23); Paolo Sclaverani, lettera 27 agosto 1934 (1926-29); Consorcio Nacional Almadrabeto - Casimiro Roda, lettera 15 agosto 1934 (1931-33)
East Atlantic	26	Torre Atalaya- actualmente Conil de la frontera	UE.ESP	36.30	-6.14	South-Western Spain	Data source: Buen (1914); Fossi (1915-16 e 1918-19); Distinta mattanze (1920-31); Consorcio Nacional Almadrabeto - Casimiro Roda, lettera 15 agosto 1934 (1932); Angelo Parodi, lettera 10 marzo 1934 (1933)
East Atlantic	28	Barbate	UE.ESP	36.19	-5.92	South-Western Spain	Data source: Dettaglio mattanze (1910-15 e 1922-26); Buen (1918); Consorcio Nacional Almadrabeto - Fossi, lettera 19 gennaio 1933 (1927-28); Consorcio Nacional Almadrabeto - Casimiro Roda, lettera 15 agosto 1934 (1931-33)
East Atlantic	29	Zahara	UE.ESP	36.14	-5.87	South-Western Spain	Data source: Giornali di pesca (1910-28); Consorcio Nacional Almadrabeto - Casimiro Roda, lettera 15 agosto 1934 (1931-33)
East Atlantic	30	Lances de Tarifa	UE.ESP	36.14	-5.63	South-Western Spain	Data source: Buen (1914); Consorcio Nacional Almadrabeto - Fossi, lettera 19 gennaio 1933 (1923-24, 1927-28 e 1933); Consorcio Nacional Almadrabeto - Casimiro Roda, lettera 15 agosto 1934 (1931-32); Lanata e Barzegza, lettera 29/8/1934 (1934)
East Atlantic	67	Suratlantica	UE.ESP			South-Western Spain	San Feliu (1978), Farrugio (1981) : Lozano Cabo (1958)

*No BFTkg data

Table 10. Spanish traps (Mediterranean Sea) reported to GBYP by IEO.

AREA	TrapID	TrapName	FlagTrap	Lat	Lon	FishingArea	DataSource
Mediterranean Sea	39	Aguas de Ceuta	UE.ESP	36.00	-5.00	Sur Mediterránea- España	Archivo General de la Marina Álvaro de Bazán
Mediterranean Sea	40	La Atunara/ La Linea	UE.ESP	36.00	-5.00	Sur Mediterránea- España	ICCAT (Rodriguez-Roda, 11.12(c) : cons.nat.alm.)
Mediterranean Sea	41	Estepona	UE.ESP	36.00	-5.00	Sur Mediterránea- España	Archivo Museo Don Álvaro de Bazán
Mediterranean Sea	46	La Azohia	UE.ESP	37.00	-1.00	Levante-España	Archivo Museo Don Álvaro de Bazán
Mediterranean Sea	68	Surmediterránea	UE.ESP			Mediterráneo-España	San Feliu (1978)
Mediterranean Sea	69	Levante	UE.ESP			Levante-España	San Feliu (1978)
Mediterranean Sea	70	Tramontana	UE.ESP			Tramontana- España	San Feliu (1978)
Mediterranean Sea	71	Baleares	UE.ESP			Baleares-España	San Feliu (1978)

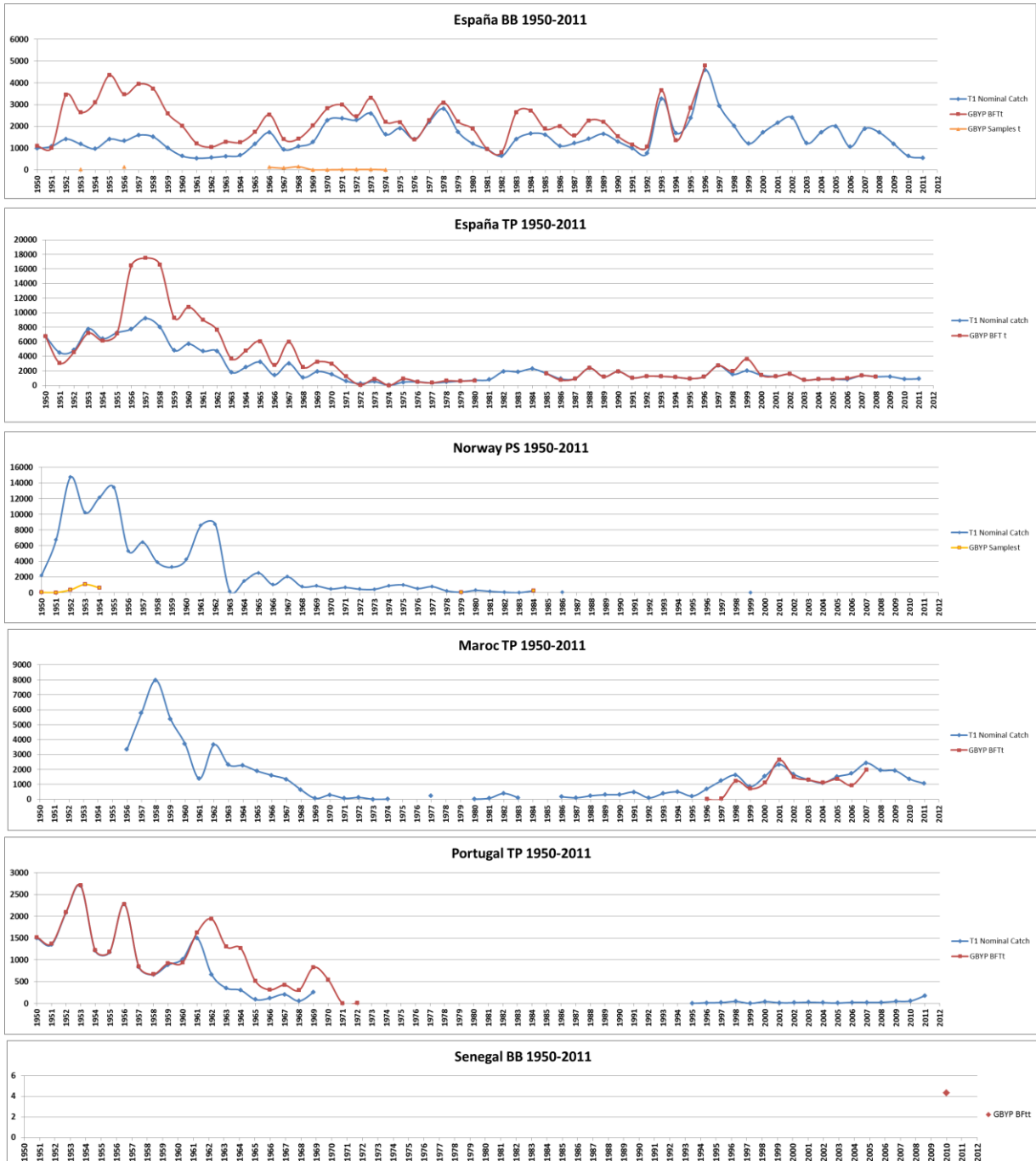


Figure 1. GBYP- ICCAT total annual catches comparison for overlaps found in the eastern Atlantic bluefin tuna stock.

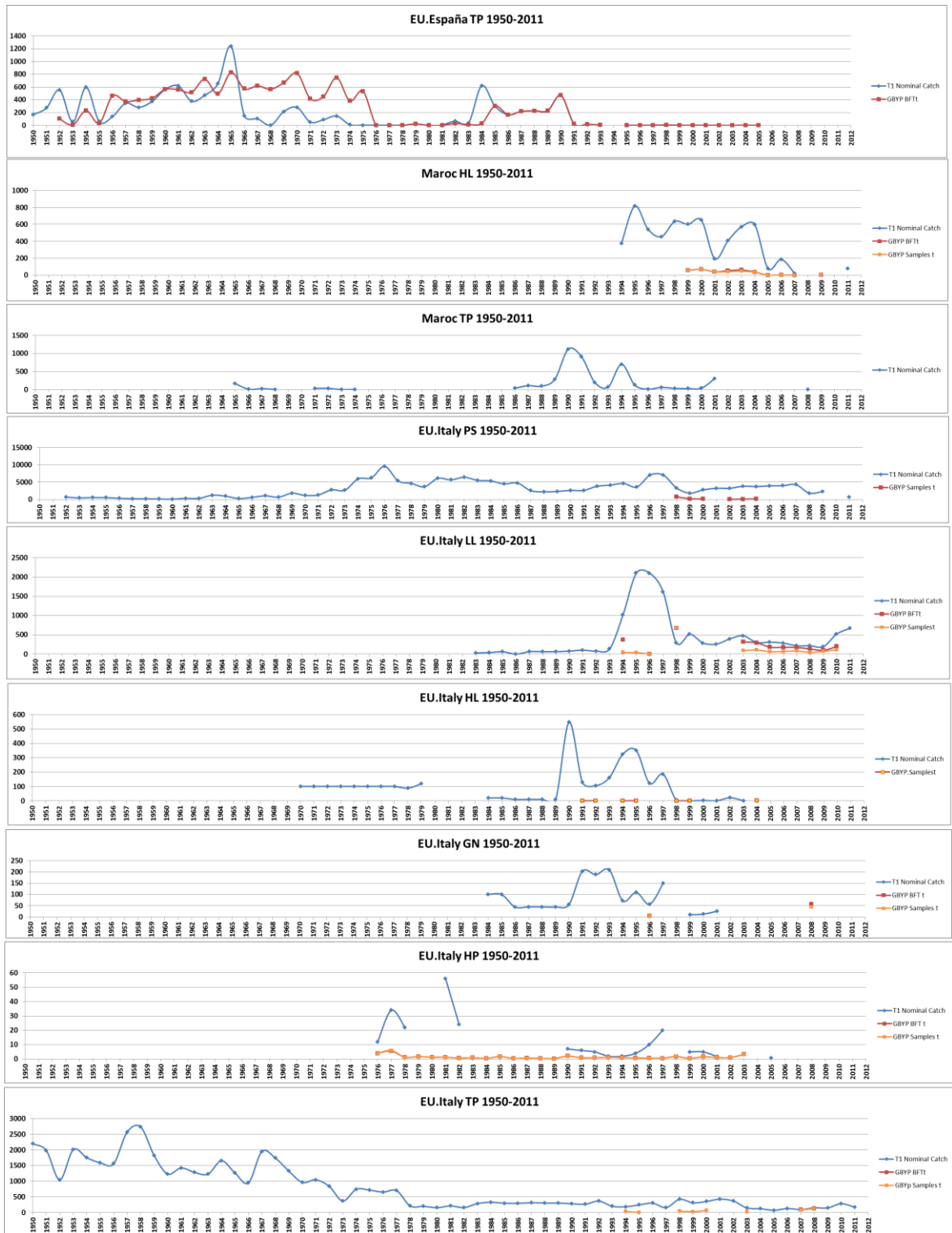


Figure 2. GBYP- ICCAT total annual catches comparison for overlaps found in the Mediterranean bluefin tuna stock.

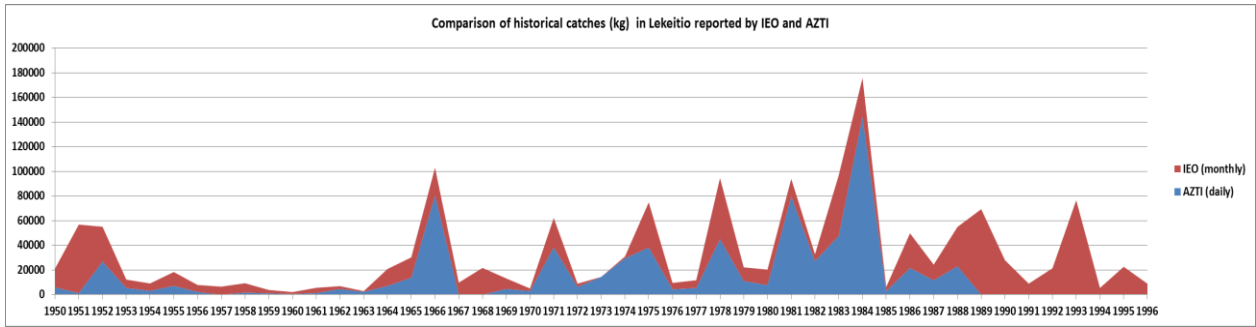


Figure 3. Lekeitio (Bay of Biscay) BFT catches in kg reported to the GBYP programme by IEO and AZTI. IEO catches are grouped by month while AZTO supplied information on daily catches.

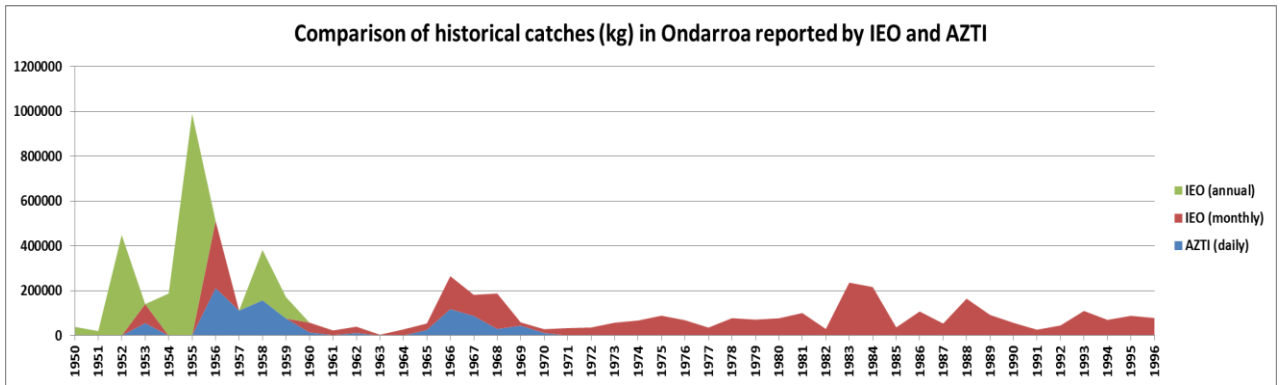


Figure 4. Ondarroa (Bay of Biscay) BFT catches in kg reported to the GBYP programme by IEO and AZTI. IEO catches are reported in a monthly basis for some years, but also as annual catches for years between 1950 and 1960.

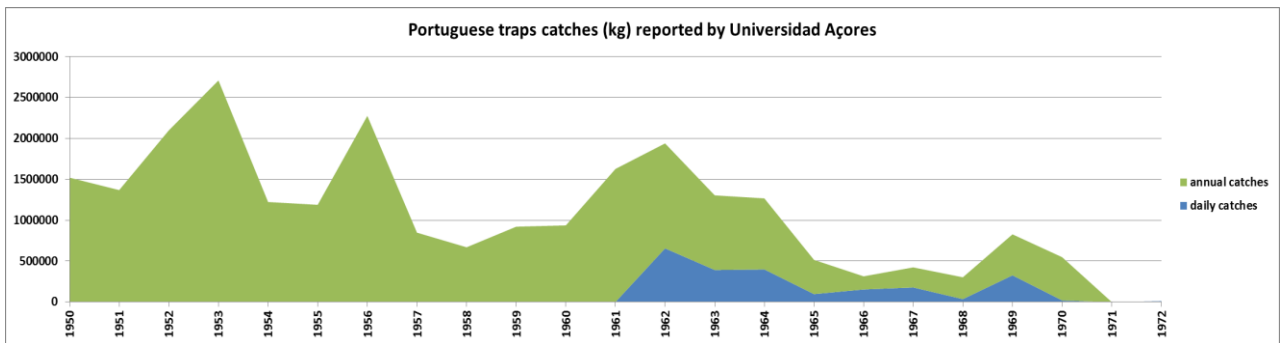


Figure 5. Portuguese traps catches in kg. reported by University Açores to the GBYP programme. Comparison of catches reported in a monthly basis vs. annual catches

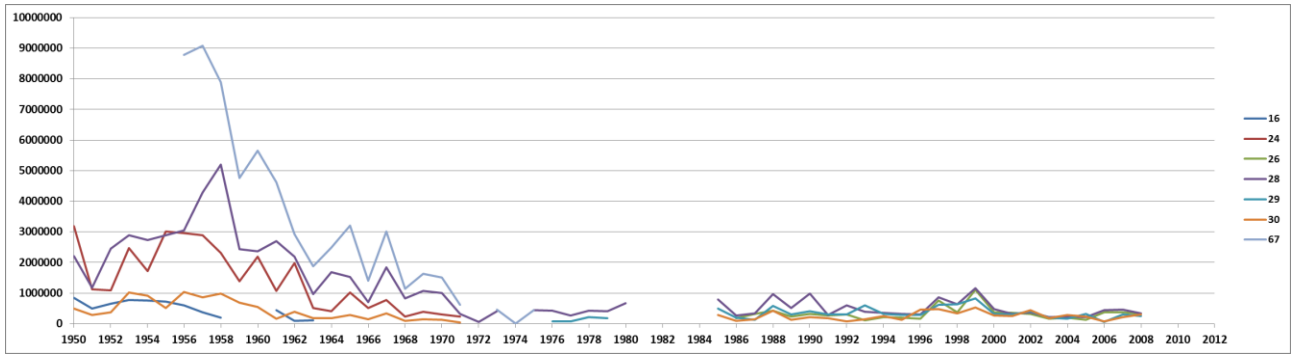


Figure 6. Annual catches of Spanish traps (East Atlantic). Trap IDs: 16- Punta Umbría; 24 – Punta de la Isla, 26- Torre Atalaya (actualmente Conil de la Frontera), 28-Barbate, 29-Zahara, 30-Lances de Tarifa, 67-Suratlántica.

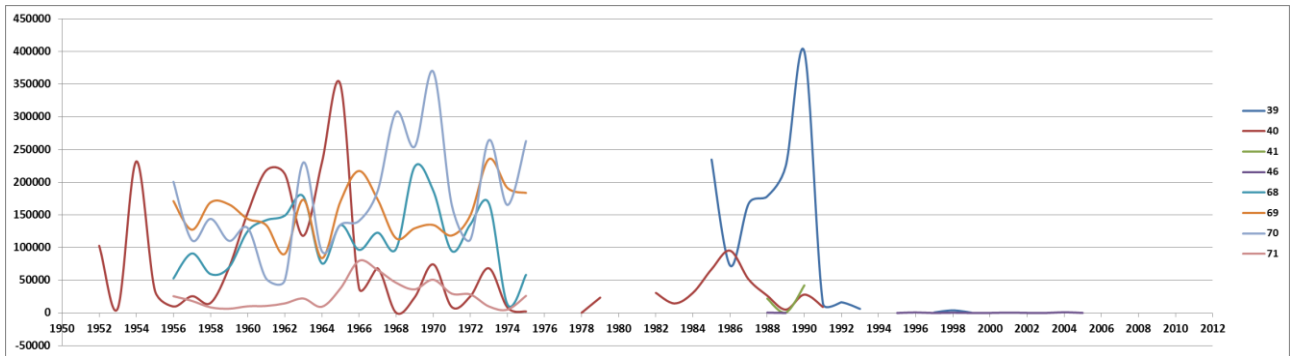


Figure 7. Annual catches of Spanish traps (Mediterranean Sea). TrapIDs: 39-Aguas de Ceuta, 40- La Atunara-La Línea, 41-Estepona, 46-La Azohía, 68-Surmediterránea, 69-Levante, 70-Tramontana, 71-Baleares.

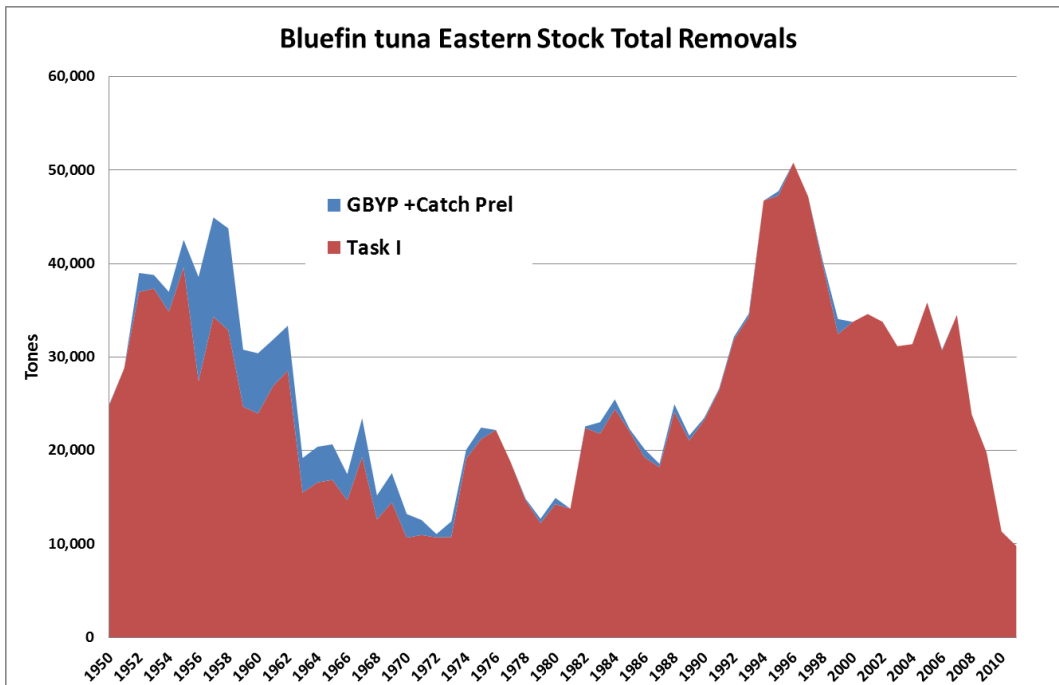


Figure 8. Estimated bluefin eastern stock total removals 1950 – 2011 as indicated if the preliminary added catches from the GBYP (blue area) are included with the current Task I reports (red area).