

REPORT ON THE USE OF RESEARCH MORTALITY ALLOWANCE BY ICCAT GBYP IN 2012-2014 AND THE FIRST PART OF 2015

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SUMMARY

Some specific research needs of the Atlantic-wide Research Programme for Bluefin Tuna (GBYP) were officially solved by ICCAT adopting the Rec. 11-06, which allows up to 20 tons of research mortality by year. This particular provision covers incidental mortality during tagging or mortality induced by biological sampling activities, within the framework of the ICCAT GBYP contracts. This first paper reports the details about the first period of enforcement of RMA (from 2012 to August 2015). It is very clear that RMA was used with a lot of caution by all contractors and that the system in place is working well. All RMA certificates are duly issued, checked and finally registered and they are able to provide all necessary details. The individual data of each fish can be used also for L/W correlations. The total used ICCAT GBYP Research Mortality Allowance was of 5.04 t in 2012, 4.39 t in 2013, 0.89 t in 2014 and 0.22 t in the first part of 2015.

RÉSUMÉ

Quelques besoins spécifiques en matière de recherche du Programme de recherche de l'ICCAT sur le thon rouge englobant tout l'Atlantique (GBYP) ont été officiellement résolus par l'ICCAT au moyen de l'adoption de la Rec. 11-06, qui prévoit une tolérance de mortalité pour la recherche (RMA) de 20 tonnes maximum par an. Cette disposition spécifique couvre la mortalité accidentelle ayant lieu pendant le marquage ou la mortalité causée par des activités d'échantillonnage biologique, dans le cadre des contrats de l'ICCAT-GBYP. Ce document apporte des détails sur la première période de mise en place de la RMA (de 2012 à août 2015). Il ressort clairement que la RMA a été utilisée avec beaucoup de prudence par tous les prestataires et que le système en place fonctionne bien. Tous les certificats RMA ont été dûment émis, vérifiés et finalement enregistrés et ils permettent de fournir tous les détails nécessaires. Les données individuelles de chaque poisson peuvent également être utilisées pour les corrélations taille/poids. Le volume total consacré à la tolérance de mortalité pour la recherche de l'ICCAT-GBYP s'élevait à 5,04 t en 2012, 4,39 t en 2013, 0,89 t en 2014 et 0,22 t au début de l'année 2015.

RESUMEN

Algunas necesidades específicas en cuanto a investigación del Programa de investigación de atún rojo para todo el Atlántico (GBYP) fueron solucionadas oficialmente por ICCAT adoptando la [Rec. 11-06], que permite hasta 20 t de mortalidad para la investigación por año. Esta disposición particular cubre la mortalidad incidental durante el marcado o la mortalidad inducida por las actividades de muestreo biológico en el marco de los contratos del ICCAT GBYP. Este primer documento informa sobre los detalles del primer periodo de ejecución de la tolerancia de mortalidad para la investigación (RMA) (desde 2012 a agosto de 2015). Está muy claro todos los prestarios utilizaron la RMA con mucha precaución y que el sistema en vigor está funcionando bien. Todos los certificados RMA son debidamente expedidos, verificados y finalmente registrados y proporcionan todos los detalles necesarios. Los datos individuales de cada pez pueden usarse también para correlaciones L/W. El total utilizado de la tolerancia de mortalidad para la investigación del ICCAT GBYP fue de 5,04 t en 2012, 4,39 t en 2013, 0,89 t en 2014 y 0,22 t en la primera parte de 2015.

KEYWORDS

Bluefin tuna, ICCAT, Research Mortality Allowance, Size frequencies, Weight frequencies, Bluefin tuna mortality

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Introduction

After the beginning of all research activities of the Atlantic-wide Research Programme for Bluefin Tuna (ICCAT GBYP) in March 2010, it was clear that some of those activities were creating formal problems in terms of incidental or deliberate mortality for bluefin tuna.

Similar problems were encountered by a previous ICCAT programme (BYP) and they were resolved by the *Supplemental Recommendation by ICCAT on Bluefin Tuna Research in the Central North Atlantic Ocean* [Rec. 01-08] (Anon., 2012).

As a matter of fact, since the first biological sampling programme it was necessary to find a legal solution for the specimens that were collected for scientific uses and the same problem was faced when the field tagging activities were conducted, because some fish incidentally died during the fishery or the manipulation on board. The peculiar problem caused by sampling undersize fish was also evident, particularly after the adoption and enforcement of the ICCAT Rec. 08-05, Rec. 09-06 and Rec. 10-04.

In the first period, the limited additional mortality was assumed by each flag CPC, declaring these individuals within the quota and issuing regular BCDs, but the general problem was clear and it was posed in front of the SCRS in 2011 and then in front of the Commission (http://iccat.int/Documents/BienRep/REP_EN_10-11_II_1.pdf page 2), where a draft Recommendation was proposed by the ICCAT Secretariat.

1. The ICCAT GBYP Research Mortality Allowance

The ICCAT Commission, after the endorsement of a draft Recommendation by Panel 2, finally adopted the *Recommendation by ICCAT Concerning the Atlantic-Wide Bluefin Tuna Research Programme (GBYP)* [Rec. 11-06] and this official decision was immediately able to provide a formal and legal solution to the several practical scientific problems linked to the various research activities of GBYP.

In particular, Art. 2 of Rec. 11-06 exempted the scientific institutions and entities participating in the ICCAT GBYP scientific research activities from the Commission's conservation measures on bluefin tuna for up to a maximum of an overall amount of 20 metric tons of bluefin tuna annually ("Research Mortality Allowance" or "RMA") taken or killed incidentally during the GBYP biological and genetic sampling programme or the tagging activities, as approved by the SCRS and endorsed by the Commission. These tunas cannot be sold for commercial purposes and shall be reported in detail to ICCAT and SCRS at the end of each Phase of GBYP, according to specific rules that will be established by the ICCAT Secretariat and attached to the research contracts.

Furthermore, Art. 3 of Rec. 11-06 exempted the same institutions from the Commission's conservation measures on bluefin tuna and particularly from the minimum size limit, the limit concerning the use of any fishing gear or tool and the fishery closures, for allowing the GBYP scientific research activities to be conducted at any time of the year, with any gear and for sampling any size of bluefin tuna, according to the annual programme approved by the SCRS and endorsed by the Commission.

The ICCAT Secretariat, on 22 May 2012, issued a first circular (No. 2296/2012), establishing the rules and the details for the enforcement of Rec. 11-06, including the official form for reporting the RMA and the first list of authorized institutions (20 entities). At the same time, specific procedures were set by the GBYP Coordination, in order to ensure a detailed recording of all the certificates and events, with special forms agreed with the ICCAT Statistical Department.

Another circular (no. 2279/2013) was issued on 28 May 2013, including 33 authorised entities. A second circular (no. 2180/2014) was issued on 23 April 2014, with a list of 36 authorised entities. A third circular (no. 3203/2015) was issued on 26 May 2015, with a list of 32 entities.

2. The use of ICCAT GBYP Research Mortality Allowance in 2012-2015

The ICCAT GBYP RMA was used with a lot of attention by all institutions participating to GBYP research activities and was clearly extremely useful from a practical point of view.

The total quantities of RMA used by year from 2012 up to August 2015 are showed on **Table 1** and **Figure 1**, along with the related number of certificates. In average, in the two complete years (2012 and 2013) when GBYP research activities were fully running, the use of RMA was around 25% of the maximum allowed by Rec.11-06. The average weight of the fish include in the RMA up to September 2015 is 9.85 kg (RWT).

Most of the RMA certificates were originating from tagging activities (~67%), because of the incidental mortality that might happens during the manipulation, and a similar majority (~73%) is concerning the quantity in kg. On the opposite, a majority of fish in number is coming from sampling (~57%) because several juvenile bluefin tunas have been sampled, including several larvae² (**Figure 2**). The detail of yearly data is on **Table 2**.

The final destination of the bluefin tuna included in the ICCAT GBYP RMA was quite variable, depending on the research needs, the opportunities and the different situations. **Figure 3** shows the distribution in detail, by year and total, both in kg and number of fish. The largest amount of RMA (~42%) was used for charity purposes, but in the reality the quantity was higher, because most of the fish classified as “mixed uses” (~5%) were very partly used for scientific purposes (sampling spines, otoliths and tissues) and the given for charity as well. A relevant quantity (~33%) was used for crew consumption, particularly when sampling was made on cruise or when it was very difficult to organise a charity donation³. About 12% of the RMA was used for scientific purposes and the details about the number of fish clearly demonstrate that many of these fish were juveniles. About 8% of the RMA was discarded at sea (usually after sampling otoliths and/or spines), either because they were fish not suitable for consumption or because they were very damaged fish. The details are on **Table 3**.

Most of the quantities used as Research Mortality Allowance by ICCAT GBYP were coming from activities carried out in the central Mediterranean Sea (~44%) and from the Strait of Gibraltar (~36%), while the majority of the specimens were originated from the central Mediterranean Sea (~34%), because of the number of juveniles and larvae sampled there; the details are showed in **Table 4** and in **Figure 4**. The average weight of the fish by area was quite variable, ranging from 0.27 kg in eastern Mediterranean to 225 kg in North-western Atlantic, with a general average of 9.85 kg.

The large majority of the quantities, both in weight (~50%) and number of fish (~35%), used by ICCAT GBYP RMA were originated by the baitboat fishery (either in the Bay of Biscay and in the Strait of Gibraltar), but important components were also originated from longlines (~15% in weight and ~5% in number of fish), while hand lines provided also important quantities in number of fish (~34%) but not in weight (~1.8%), because they were used for sampling juvenile tunas. The average weight by gear is quite representative of the usual average. The details are showed on **Table 5** and **Figure 5**.

3. Possible use of individual fish data from ICCAT GBYP Research Mortality Allowance

The data from the individual fish reported on ICCAT GBYP RMA certificates are usually of the best quality, because these forms were compiled by scientists under the best possible conditions. Then, length and weight measurements are usually very accurate, also because these data will be used as reference for biological analyses (including ageing). Only in very few cases, when small juveniles of age 0 were sampled, the weight was provided in total for fish having exactly the same fork length. For these reasons, size and weight data from RMA certificates can be used not only for having a general overview of the size and weight frequencies (**Figure 6**), but also for improving the number of samples which can be used for L/W correlations (**Figure 7**).

4. Discussion

After these first three years of experience about the enforcement of Rec.11-06, it is very evident that the provisions included in this recommendation were extremely useful and well thought. The practical aspect of the mortality happening during some GBYP research activities is showing a full and easy enforcement of the Rec. 11-06, with certificates issued, checked and confirmed in real time by GBYP, while all files are available at the Secretariat for all possible uses.

The possibility of improving available data for any SCRS uses was not considered at the beginning but it is now to be taken into account, because of the high quality of the size and weight data reported by the certificates.

² It seems that only fertilised eggs do not need an ICCAT BCD or certificate, while larvae, being already fish, need certificates for being exported and, as a consequence, sampling larvae for genetic analyses generated a RMA certificate.

³ In some CPCs or ports local rules made sometimes impossible a donation of fresh fish for charity; there is clearly room for improving rules and provisions about charity donations.

The mortality caused by the use of RMA, regularly reported by GBYP to the ICCAT Secretariat and now included also in the GBYP detailed annual report (Di Natale, 2015a, 2015b; Di Natale *et al.*, 2014), shall be included in the ICCAT statistics and in the tables provided to SCRS.

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Table 1. ICCAT GBYP Research Mortality Allowance used from 2012 to September 2015 (in kg and number of fish) and related number of RMA certificates issued in the various years.

<i>ICCAT GBYP RMA</i>	<i>2012</i>	<i>2013</i>	<i>2014</i>	<i>2015 (part)</i>	<i>TOTAL</i>
kg	5039,49	4392,76	887,78	219,86	10539,89
No. fish	662	279	96	33	1070
No. forms	94	60	11	7	172

Table 2. ICCAT GBYP Research Mortality Allowance as originated by the two main field research activities (tagging and sampling) from 2012 to September 2015, in weight (kg), number of fish and number of certificates, by year and in total.

	<i>2012</i>	<i>2013</i>	<i>2014</i>	<i>2015 (part)</i>	<i>TOTAL</i>
kg					
sampling	2438,42	137,61	163,479	123,86	2863,37
tagging	2601,07	4255,146	724,3	96,00	7676,52
no. fish					
sampling	438	52	90	29	609
tagging	224	227	6	4	461
no. forms					
sampling	36	5	9	4	56
tagging	58	55	2	1	116
	<i>2012</i>	<i>2013</i>	<i>2014</i>	<i>2015 (part)</i>	<i>TOTAL</i>
kg					
sampling	48,39%	3,13%	18,41%	56,34%	27,17%
tagging	51,61%	96,87%	81,59%	43,66%	72,83%
no. fish					
sampling	66,16%	18,64%	93,75%	87,88%	56,92%
tagging	33,84%	81,36%	6,25%	12,12%	43,08%
no. forms					
sampling	38,30%	8,33%	81,82%	85,71%	32,56%
tagging	61,70%	91,67%	18,18%	14,29%	67,44%

Table 3. Final destination of the quantities derived from the ICCAT GBYP Research Mortality Allowance, in percentage over the total, in kg and in number of fish, for the period 2012 to September 2015.

<i>RMA by Destination</i>	<i>Charity</i>	<i>Consumption</i>	<i>Discarded</i>	<i>Mixed uses, other</i>	<i>Scientific</i>
kg	4.443,32	3.457,19	867,28	552,40	1.219,70
kg (%)	42,16%	32,80%	8,23%	5,24%	11,57%
no. fish	270	157	63	22	558
no. fish (%)	25,23%	14,67%	5,89%	2,06%	52,15%

Table 4. Origin of the various fish included in the ICCAT GBYP RMA, in percentage over the total for the period 2012 to September 2015, in kg and in number of fish; the table shows also the average weight by area.

<i>RMA by Fishing Area</i>	<i>Bay of Biscay</i>	<i>Canada</i>	<i>Central Med</i>	<i>Eastern Med</i>	<i>Gibraltar Strait</i>	<i>West Med</i>
kg	1.715,24	225,00	4.585,12	88,02	3.765,90	160,61
kg (%)	16,27%	2,13%	43,50%	0,84%	35,73%	1,52%
no. fish	231	1	365	323	105	45
no. fish (%)	21,59%	0,09%	34,11%	30,19%	9,81%	4,21%
no. forms	45	1	54	3	62	7
no. forms (%)	26,16%	0,58%	31,40%	1,74%	36,05%	4,07%
mean weight (kg)	7,43	225,00	12,56	0,27	35,87	3,57

Table 5. Origin by fishing gear of the various quantities included in the ICCAT GBYP RMA during the period 2012 to September 2015. The table also shows the average weight by area.

	BB	Bongo Net	Cage	FAD	HL	LL	LLSWO	PS	RR	TP	TR
kg	5.321,08	0,02	995,35	13,61	193,81	1.601,30	53,92	1.032,90	249,11	818,40	260,39
kg (%)	50,49%	0,00%	9,44%	0,13%	1,84%	15,19%	0,51%	9,80%	2,36%	7,76%	2,47%
no. fish	371	39	66	50	359	56	2	56	40	8	23
no. fish (%)	34,67%	3,64%	6,17%	4,67%	33,55%	5,23%	0,19%	5,23%	3,74%	0,75%	2,15%
mean weight (kg)	14,34	0,00	15,08	0,27	0,54	28,59	26,96	18,44	6,23	102,30	11,32

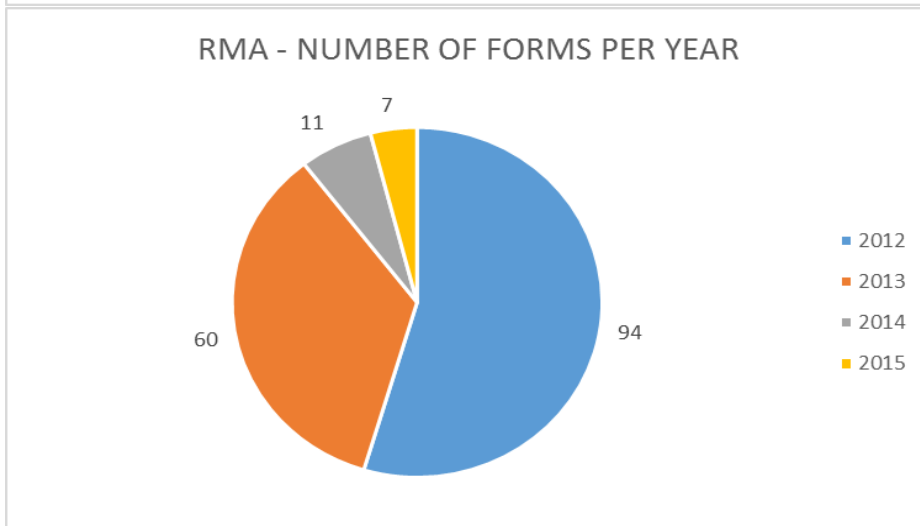
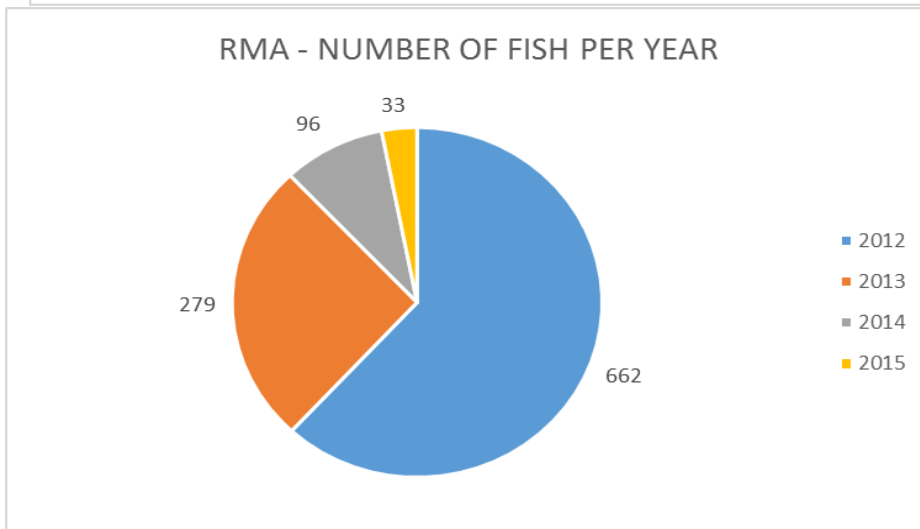
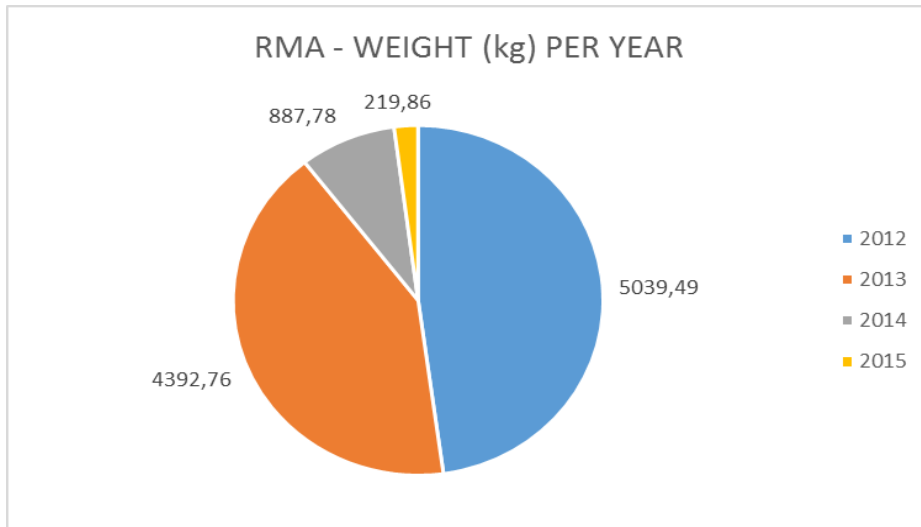


Figure 1 – **1a)** graph of the total quantities in kg of RMA used from 2012 to September 2015; **1b)** RMA used from 2012 to September 2015 in number of fish, and **1c)** graph showing the total number of ICCAT GBYP RMA certificates issued yearly from 2012 to September 2015.

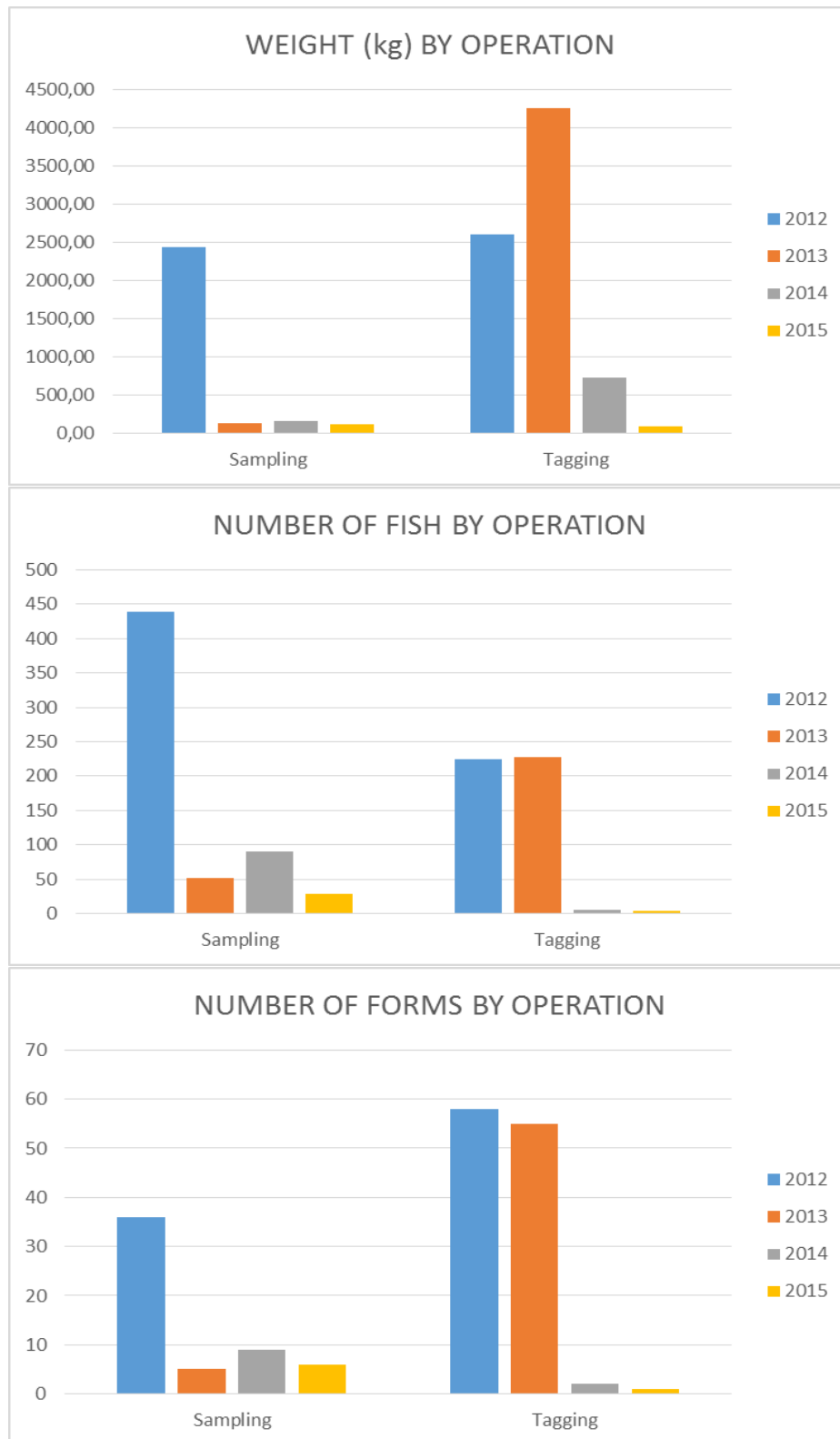


Figure 2. ICCAT GBYP RMA as originated by the two main field research activities (tagging and sampling) from 2012 to September 2015, in weight (kg), number of fish and number of certificates, by year.

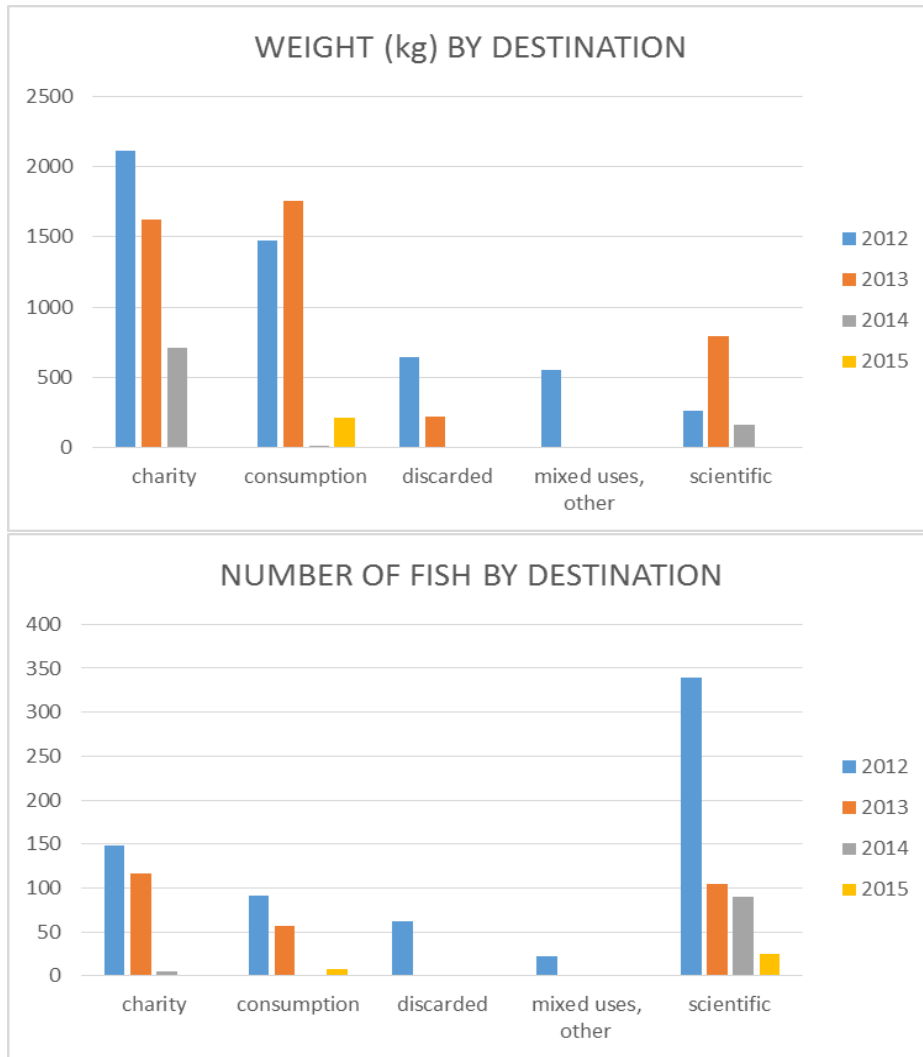


Figure 3. Various destinations of the RMA from 2012 to September 2015, in kg and number of fish.

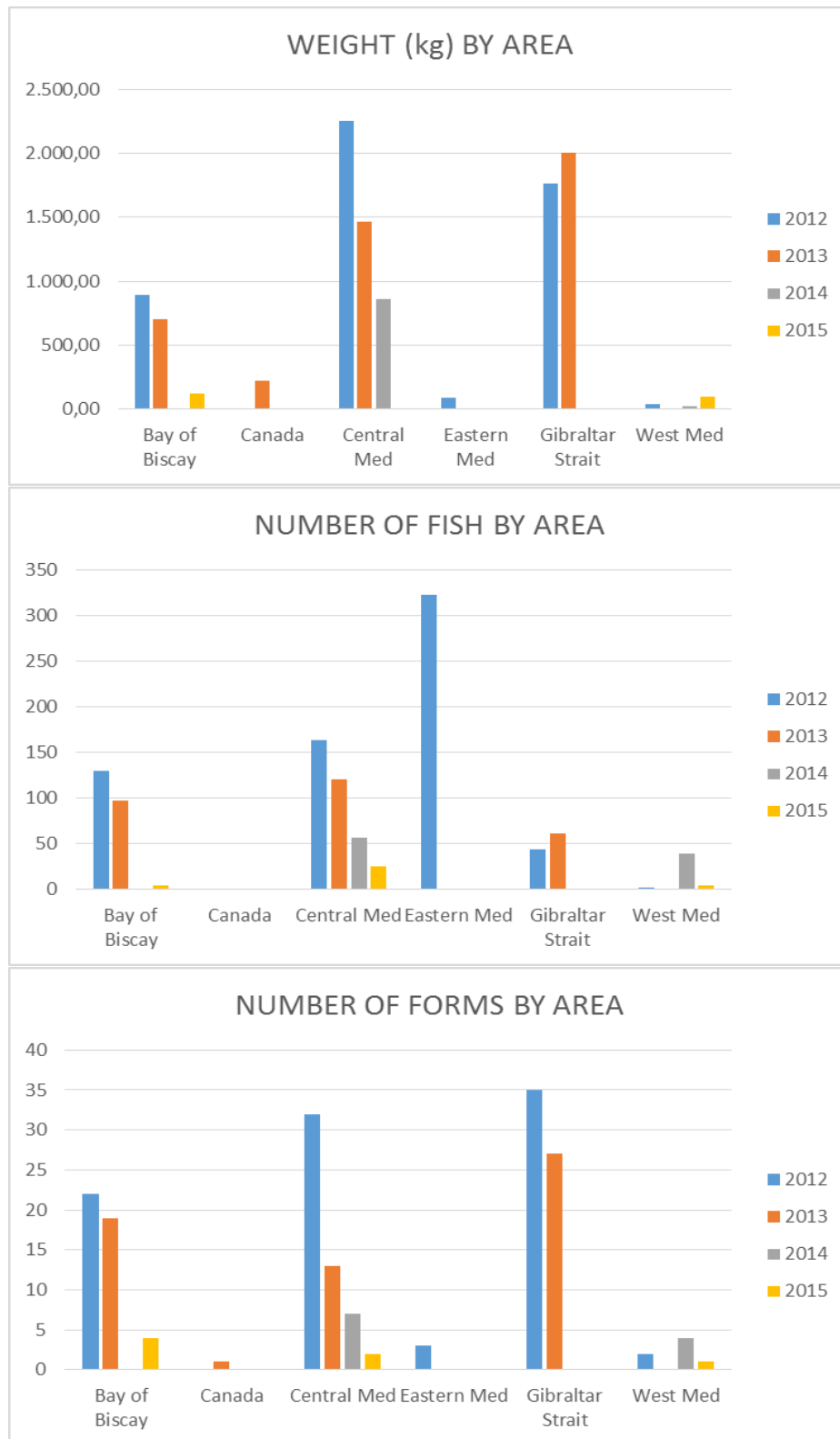


Figure 4. Origin by fishing area of the quantities used by ICCAT GBYP RMA, from 2012 to September 2015, in weight (kg), number of fish and number of certificates, by year.

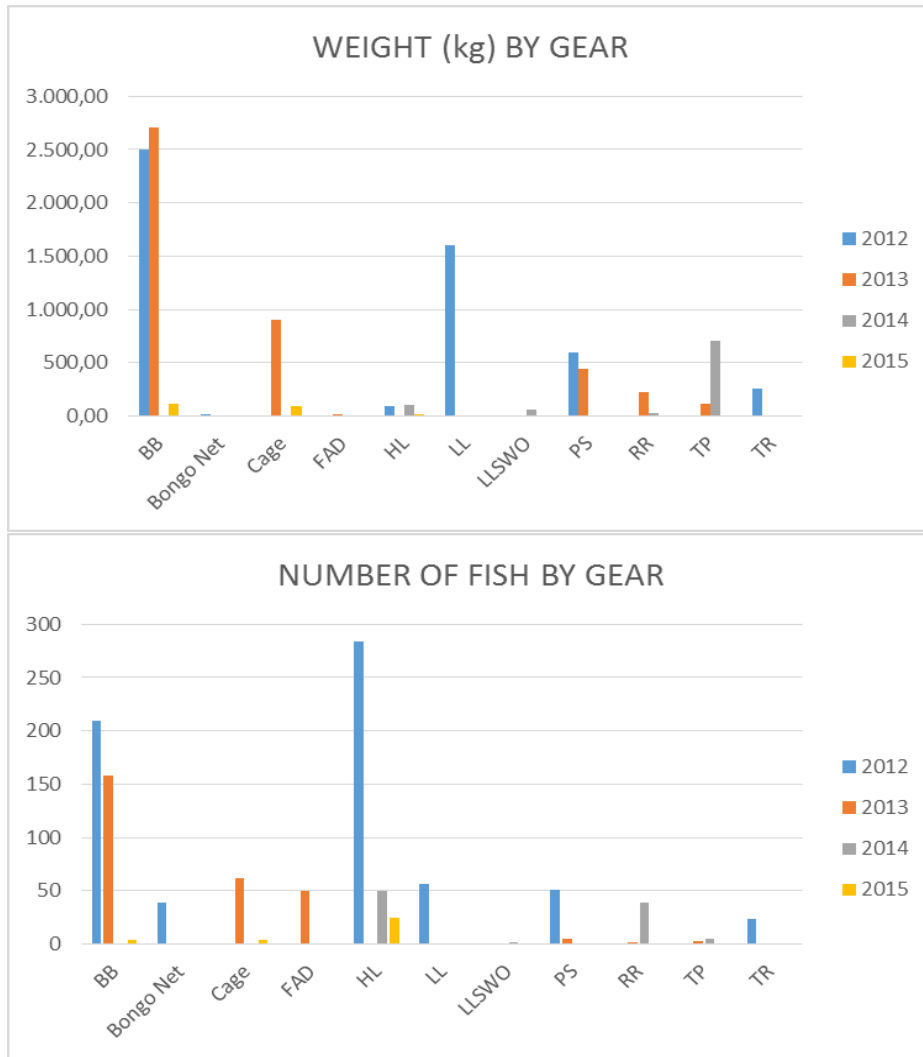


Figure 5. Distribution of ICCAT GBYP RMA by gear (from 2012 to September 2015), in kg and number of fish.

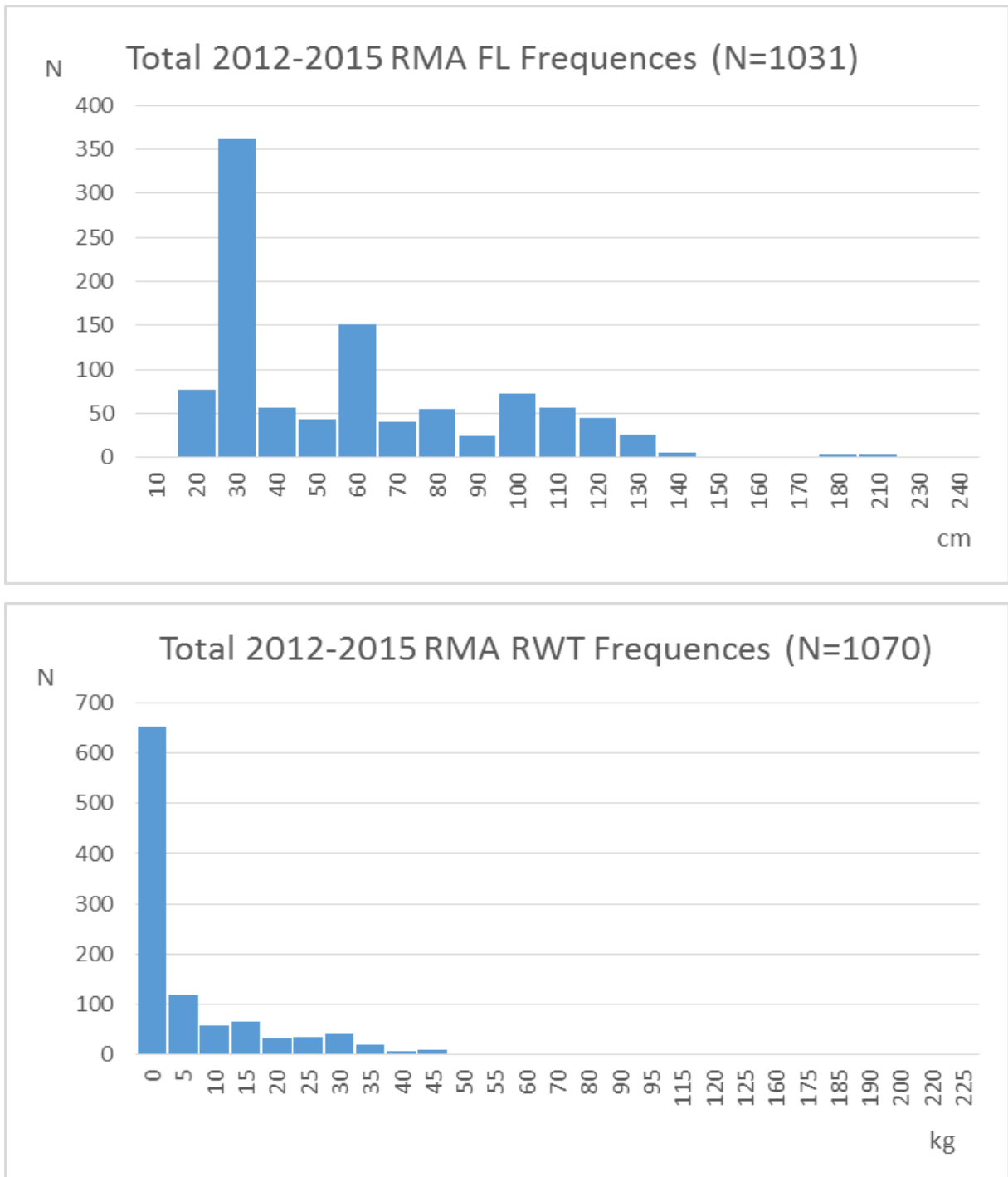


Figure 6. FL frequencies in cm (**6a**) and RWT in kg frequencies (**6b**) of RMA specimens for the total period 2012 to September 2015. FL for larvae was not included in the upper graph for obvious reasons.

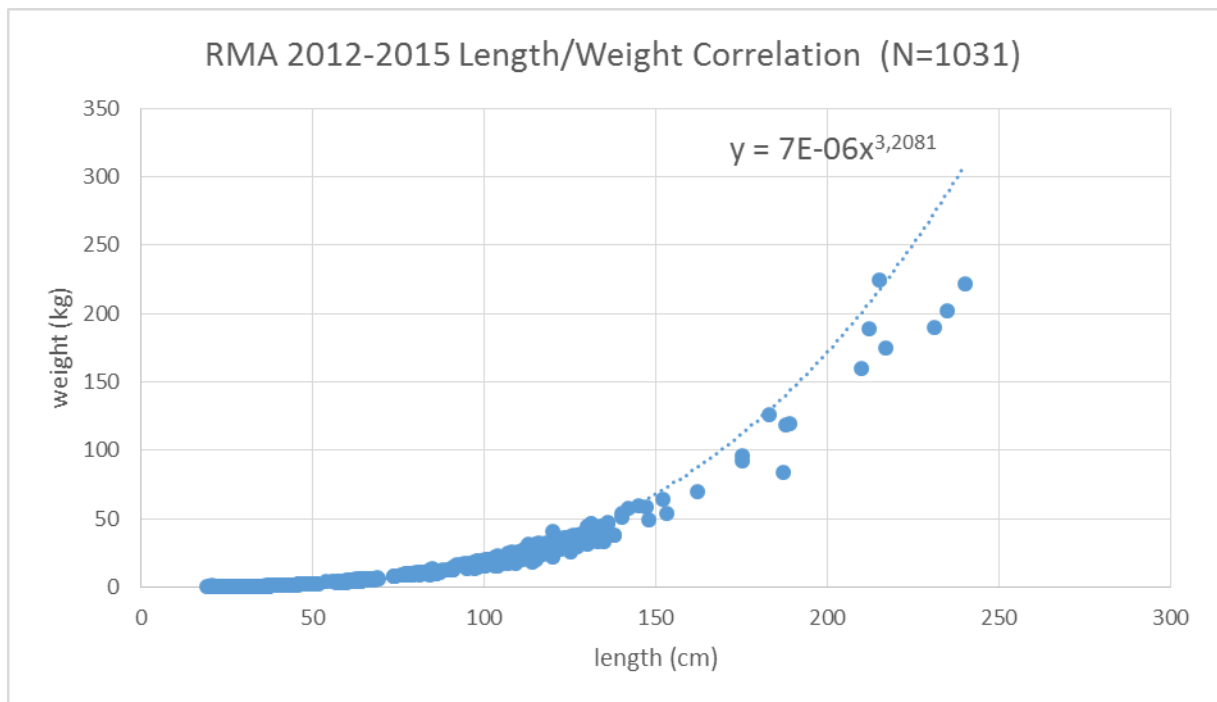


Figure 7. Length/weight correlation for the total period 2012 to September 2015 for the bluefin tuna reported by ICCAT GBYP RMA, from all areas.