OVERVIEW OF THE BLUEFIN TUNA DATA RECOVERY IN GBYP PHASE 6

Antonio Di Natale[1], Alfonso Pagá García[1], Stasa Tensek[1]

SUMMARY

The Atlantic-wide research programme on bluefin tuna (GBYP), has the objective to improve the bluefin tuna data through mining and recovery of any potential source of data not already included in the ICCAT bluefin tuna data base. A preliminary review of the results of the data recovery activity in Phase 6 are here presented. The work carried out in this Phase includes the recovery of significant quantities of longline (LL) bluefin tuna catches and some historical trap catches, filling gaps in already existing series. Furthermore, some additional data were recovered from old sources in the Canary Islands. The files also include data concerning other tuna species that will be analysed in detail in the following months. Electronic tags data sets are also under recovery. The duties in Phase 6 also included an updating of the verification and validation of the historical trap data and a first analysis of the market, trade and auction data recovered in Phase 4, a preliminary analysis of the data from conventional tagging, including growth ones and a recompilation and review of old data on maturity.

RÉSUMÉ

Le programme de recherche sur le thon rouge englobant tout l'Atlantique (ICCAT-GBYP) a pour objectif l'amélioration des données sur le thon rouge en explorant et en récupérant toutes les sources éventuelles de données qui ne sont pas encore incluses dans la base de données sur le thon rouge de l'ICCAT. Un examen préliminaire des résultats des activités de récupération des données pendant la phase 6 est présenté. Le travail mené dans cette phase comprend la récupération de quantités importantes de prises palangrières (LL) de thon rouge et de quelques captures historiques de madragues, en comblant les lacunes dans les séries déjà existantes. En outre, certaines données supplémentaires ont été récupérées à partir d'anciennes sources aux îles Canaries. Les fichiers comprennent également des données concernant d'autres espèces de thonidés qui seront analysées dans le détail au cours des mois suivants. Les jeux de données de marques électroniques sont également en cours de récupération. Les tâches à réaliser au cours de la phase 6 comprenaient également une mise à jour de la vérification et de la validation des données historiques des madragues ainsi qu'une première analyse des données du marché, du commerce et des ventes à la criée récupérées dans la phase 4, une analyse préliminaire des données de marquage conventionnel, y compris celles sur la croissance et une recompilation et un examen des anciennes données sur la maturité.

RESUMEN

El Programa de investigación sobre atún rojo para todo el Atlántico (GBYP), tiene el objetivo mejorar los datos de atún rojo mediante la minería de datos y la recuperación de cualquier posible fuente de datos que no esté ya incluida en la base de datos de atún rojo de ICCAT. Se presenta aquí una revisión preliminar de los resultados de las actividades de recuperación de datos en la Fase 6. El trabajo llevado a cabo en esta fase incluye la recuperación de cantidades importantes de capturas de atún rojo de palangre y de algunas capturas históricas de las almadrabas, cubriendo lagunas en series ya existentes. Además, se recuperaron datos adicionales de antiguas fuentes en las islas Canarias. Los archivos incluyen también datos sobre otras especies de túnidos que se analizarán en detalle en los próximos meses. Se están recuperando también conjuntos de datos de marcas electrónicas. Las tareas en la Fase 6 incluían también una actualización de la verificación y validación de los datos históricos de almadrabas y un primer análisis de los datos de mercados, comercio y subastas recuperados en la Fase 4, un análisis preliminar de los datos de marcado convencional, incluidos los de crecimiento, y una recopilación y revisión de datos antiguos sobre madurez.

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[1] ICCAT, GBYP – Calle Corazón de Maria 8, 6ª – 28002 Madrid (Spain).

KEYWORDS

Bluefin tuna, large pelagic species, longline catches, trap catches, data recovery

1. Introduction

Since the beginning of the GBYP, one of the main objective is the data mining and data recovery, for which the details are set every year by the GBYP Steering Committee and by the SCRS. So far, this item of the ICCAT GBYP activity recovered data from many fisheries over a large range of years (more than 5 centuries), samples used for genetic analyses (more than 22 centuries), carried out analyses for several data sets and worked together with the SCRS, particularly the SCRS BFT Species Group) for recovering the data from electronic tags.

In Phase 6, the GBYP has the goal to recover further data which are still not in the ICCAT BFT data base (both historical or recent), to further recover additional important sets of electronic tags, to update the verification and validation of the historical trap data, to carry out a first analysis of the market, trade and auction data recovered in Phase 4, to provide a preliminary analysis of the data obtained from the electronic tags deployed by GBYP up to Phase 5 and to provide a preliminary analysis of the data from conventional tagging, including any data useful for better defying bluefin tuna growth. Furthermore, GBYP has been requested to recompile and revise the old data published on bluefin tuna maturity, providing them to the SCRS Bluefin Tuna Species Group.

2. Bluefin tuna fishery data recovered in Phase 6

ICCAT GBYP issued one Call for Tenders under this activity in Phase 6 (Call 02/2016, ICCAT Circular 0291on 14/03/2016), releasing 3 contracts. One contract was for recovering recent long-line data (by area, vessel, day, effort, catch in kg and number, length and weigh individual frequencies)[2], a second one for additional recent long-line data with the same details and for additional historical trap data[3], and a third one for trying the recovery of historical catch data in the Canary Islands zone[4]. No proposals have been received from other ICCAT areas.

All contracts expired in July 2016, GBYP received the data sets and therefore there was no time before this short report for carrying out any analysis or quality check of the many data sets, but this report is provided in real time to the SCRS. Most of the data have also pdf copy of the original documents that were found and exploited, most of them with ancient hand writings.

LL and TRAP bluefin tuna data account for a total of 2,666,971 kg and 13,264 fish, while the data from the Canary Islands concerns a total of 36,877 kg of bluefin tuna, but many data needs a further analysis, because most are related to not-well defined tuna species. The summary results of the data recovery activity carried out in Phase 6 are shown on **Table 1** and **Table 2.** All data were provided on the Excel forms, in the format used by the ICCAT Statistical Department.

The data sets recovered from Mediterranean LL for the years 2002-2015 (which are additional data sets not already available in the ICCAT data base) have catches by vessel, area and day, partly with effort data (no. of hooks/day) and are related to a total catch of 11,070 bluefin tunas and a total weight of 112,875 kg. 11,059 bluefin tunas have individual length or weight or both. The data will be made available to the SCRS scientists after checking their quality in detail, according to the procedures in place. The list of the vessels names were provided to GBYP for avoiding any potential risk of duplicating values, but under a strict confidentiality agreement.

The data sets recovered for ancient Italian traps for the period 1823-1922 were extracted from additional documents recently discovered and they fill some temporal gaps in already existing data series (Pagá García *et al.*, in press), for 13 traps. The data varies from trap to trap, from daily catches by fishing operation ("mattanza" to total year catch). The trap data are related to only 8,463 bluefin tuna in number, and 2,554,096 kg, because in most of the cases, only the total catch in weight was recorded on the original documents. The difficulties for recovering these data was considerable, because they were extracted from original confidential registers of the tuna trap owner (**Figure 1**) or even personal correspondence between the local trap administrator and the owner (**Figure 2**), all very difficult to read and sometimes using also local dialect names for the fish or fish commercial categories.

These data sets for long lines and historical traps are additional to those already recovered in previous GBYP Phases (Di Natale and Tensek, 2016).

The data sets recovered in the Canary Islands were extracted from ancient registers of various Spanish factories in Tenerife, La Gomera and Las Palmas, providing various types of data by year, month or even day, sometimes by number of fish and/or weight by specie and by factory. **Figure 3** shows an ancient tuna factory in La Gomera, while **Figure 4** provides an example of the registers that were exploited. The data recovered are related to various tuna species, to be further analysed in detail, and includes for sure at least a total of 36,877 kg of bluefin tuna catches. A main problem is related to unidentified tuna species related to the number or weight of mixing tuna species which arrived to the salting and canning factories. **Table 2** shows the data for all species in detail.

Additionally it was possible to recover information related to the vessels fishing in the Canary area, but was impossible to relate each vessel with their correspondent catch. Catches were possibly obtained by hand lines (HAND) or pelagic trawls (MWT), as previously reported by Di Natale (2014).

3. Electronic tags data recovered in Phase 6

Following the recommendation of both the SCRS Bluefin Tuna Species Group and the GBYP Steering Committee, ICCAT GBYP released three invitations (ICCAT GBYP 04/2016 on 24/04/2016) to scientists surely having important data sets obtained from electronic tags deployed in many years. Prof. Molly Lutcavage very kindly provided the data directly to the expert in charge for elaborating the electronic tag data SCRS Bluefin Tuna Species Group (Dr. Matt Lauretta) and these were passed also to the GBYP Expert for supporting the bluefin tuna stock assessment and MSE process (Dr. Tom Carruthers). Dr. Michele Deflorio decided to delay the data delivery after publishing them on a scientific paper. Prof. Barbara Block agreed for a contract for providing the data in the format required by ICCAT GBYP; the contract was signed with the Board of Trusties of the Leland Stanford Junior University (USA) and concerns a total of 393 electronic tags of various types. These data will be made available at the end of August 2016.

4. Analyses of other data previously recovered or collected by ICCAT GBYP

ICCAT GBYP had the duty to carry out several analyses on data which were recovered or collected in all Phases under different activities. Specifically, the work carried out in the last part of Phase 5 and in this first part of Phase 6 was to update the verification and validation of the historical trap data, to carry out a first analysis of the market, trade and auction data recovered in Phase 4, to provide a preliminary analysis of the data obtained from the electronic tags deployed by GBYP up to Phase 5 and to provide a preliminary analysis of the data from conventional tagging, including any data useful for better defying bluefin tuna growth.

The trap data were duly checked and revised according to the procedure recommended by the SCRS BFT SG and the SCRS Subcomstat in 2015, and the report has been made available on the document SCRS/2016/139 (Pagá García *et al.*, in press).

The first analysis of trade, market and auction data was carried out as recommended by the SCRS Bluefin Tuna Species Group, using only data certainly referred to individual bluefin tunas with the best data quality, and even this report has been made available on the document SCRS/2016/142 (Di Natale *et al.*, in press).

The preliminary analysis of the data obtained from the electronic tags deployed by GBYP up to Phase 5 was carried out on duly time and the report has been made available on the document SCRS/2016/138 (Tensek *et al.*, in press).

The preliminary analysis of the data from conventional tagging, including any data useful for better defying bluefin tuna growth and displacements has been carried out and even this report has been made available on the document SCRS/2016/143 (Di Natale *et al.*, in press).

Finally, GBYP has been requested to recompile and revise the old data published on bluefin tuna maturity, providing them to the SCRS Bluefin Tuna Species Group. Even this work was duly done and the report has been made available on the document SCRS/2016/141 (Di Natale *et al.*, in press).

Bibliography

Di Natale A., 2014. An unknown bluefin tuna fishery and industry in Tenerife in the early XX century: The Florio Enterprise. Col. Vol. Sci. Pap. ICCAT, 71 (3): 1152-1173.

Di Natale A., Tensek S., 2016, ICCAT Atlantic-wide Research Programme for Bluefin tuna (GBYP). Activity report for the last part of Phase 4 and the first part of Phase 5 (2014-2015). Col. Vol. Sci. Pap. ICCAT, 72 (6): 1477-1530.

Di Natale A., Pagá Garcia A., Tensek S., (in press). Bluefin tuna (*Thunnus thynnus*) growth and movements derived from conventional tags data. Document SCRS/2016/143: 10 p.

Di Natale A., Tensek S., Pagá Garcia A., (in press). Studies on eastern bluefin tuna (*Thunnus thynnus*) maturity. Review of old literature. Document SCRS/2016/141: 17 p.

Di Natale A., Tensek S., Die D., Porch C., Bonhommeau S., Takeuchi Y., Melvin G., Mielgo Bregazzi R., de Bruyn P., Palma C., (in press). Bluefin tuna weight frequencies from selected market and auction data recovered by GBYP. Document SCRS/2016/139: 59 p.

Pagá Garcia A., Palma C., Di Natale A., Tensek S., Parrilla A., de Bruyn P., (in press). Report on revised trap data recovered by ICCAT GBYP between Phase 1 to Phase 6. Document SCRS/2016/142: 24 p.

Tensek S., Di Natale A., Pagá Garcia A., (in press). ICCAT GBYP PSAT tagging: the first five years. Document SCRS/2016/138: 16 p.

Table 1. Data recovered from longliners (LL) and traps (TRAP) in Italy.

Fishing period	Gear	Fishing area	BFT total catch n	BFT total catch kg	BFT Samples (FL and/or weight)	No. of vessels
2002-2015	LL	Adriatic Sea	1952	92310.4	1952	3
2002-2015	LL	Strait of Sicily	2417	112875	2417	22
2002-2015	LL	Tyrrhenian Sea	6690	340964.5	6690	6
2013-2015	LL	Sardinia	11	1097.1		1
1823-1836	TRAP	Marzamemi	1638	44099		
1918-1922	TRAP	Scopello		366220		
1918-1922	TRAP	Castellammare del Golfo		195700		
1918-1922	TRAP	Magazzinazzi		626900		
1920-1922	TRAP	Orsa	556	10700		
1922	TRAP	Isola delle Femmine		21900		
1922	TRAP	Mondello		64300		
1920-1922	TRAP	Vergine Maria		7077		
1918-1922	TRAP	S. Elia		267900		
1918-1922	TRAP	Solanto		463600		
1918-1922	TRAP	S. Nicolò		173500		
1918-1922	TRAP	Trabia		297700		
1920-1922	TRAP	Torre Caldura		14500		

Table 2. Data recovered in salting and cannery factories from handliners (HAND) and mid-water pelagic trawl (MWT) in Canary Islands.

Factory Name	Fishing Period	Indeterminated Species (n)	Indeterminated Species (kg)	BFT kg	ALB kg	YFT kg	BET kg	SKJ kg
Casanova	1926-1939	1778	545512					95227
Gran Canaria	1966-1984			5773	263995	720522	9030082	5245444
La Rajita	1926-1984	3873	4766308	20995	1408811	171557	6964369	6380551
Novaro	1931-1934	2204	106748					15366
Santiago	1927-1983	5089	1438805	4878	333435	2875	2302941	2035091
Tenerife	1949-1984		339161	5231	62765	391559	2431410	3869455
Trujillo	1927-1934	1485	269698					70110
TOTAL	1926-1984	**14429**	**7466232**	**36877**	**2069006**	**1286513**	**20728802**	**17711244**

Figure 1. Example of one register from the tuna trap in Marzamemi (SE Sicily, Italy), showing the daily catches by species or category, also with market price and final destination (sold on the market, salted, compensation for services, crew consumption and charity), for the week 8 to 14 September 1833.
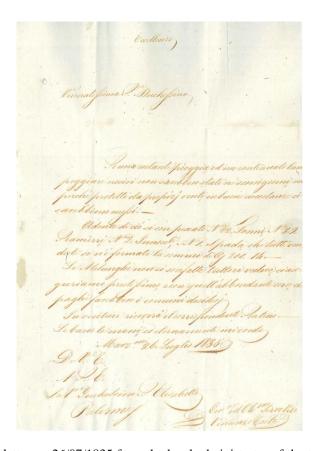

Figure 2. Example of one letter on 26/07/1835 from the local administrator of the tuna trap in Marzamemi (SE Sicily, Italy) to the trap owner, reporting the daily catches by species or category, with additional info about the weather conditions.

Figure 3. The old tuna salting and canning factory of La Rajita (La Gomera, Canary Islands) in 1934 (from El Diario.es),

Figure 4. An example of an old register for the year 1972, which includes data from several tuna factories located in the island of La Gomera (Canary Islands, Spain).