2011 ICCAT ATLANTIC-WIDE RESEARCH PROGRAMME FOR BLUEFIN TUNA (GBYP). COORDINATION DETAILED ACTIVITY REPORT FOR PHASE 2

Antonio Di Natale[1] and M´Hamed Idrissi[2]

SUMMARY

The Atlantic-wide Research Programme for Bluefin Tuna (GBYP) officially began in October 2009. The second phase of GBYP activities began in December 2010, including: (a) continuation of data mining / recovery and 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. The GBYP staff was strengthened. An important amount of data has been recovered on more than 24 million bluefin tuna individuals, from some 37,000 fishing operations from the 16th to the 20th centuries. Three main areas in the Mediterranean have been aerially surveyed for more 276,000 km2), providing additional data to be compared to those of 2010, increasing the base to be used to detect trends; aerial survey data are under analysis, along with the SST data used for spatial analysis. A consortium of 13 scientific research institutions was set up to carry out the biological and genetic sampling and analyses from all the main fishing areas. Another consortium of 6 entities is carrying out the 2011 tagging programme covering the Bay of Biscay, Strait of Gibraltar, and the western and central Mediterranean, in order to tag about 5,500 bluefin tuna juveniles (ages 0-3). In terms of modeling, the GBYP will initially focus on risk analysis to identify the main perceived sources of uncertainty related to assessment and advice, and development of new assessment and advice based on various data sets being collected and the new knowledge being gained under the GBYP.

RÉSUMÉ

Le Programme de recherche sur le thon rouge englobant tout l'Atlantique (GBYP) a commencé officiellement ses activités en octobre 2009. La deuxième phase des activités du GBYP a démarré en décembre 2010, à savoir : (a) poursuite de l'exploration /récupération et élaboration des données ; (b) poursuite des prospections aériennes des concentrations de reproducteurs ; (c) échantillonnage biologique et génétique et analyses ; (d) marquage conventionnel, y compris campagne de sensibilisation et de récompense ; et (e) premières étapes des approches de modélisation. Les effectifs du GBYP ont été augmentés. Un grand volume de données a été récupéré concernant plus de 24 millions de spécimens de thons rouges provenant de 37.000 opérations de pêche réalisées entre le 16e et le 20e siècle. Trois secteurs principaux de la Méditerranée ont déjà fait l'objet de prospections aériennes, couvrant une zone de plus de 276.000 km2. Ces prospections fournissent des données supplémentaires à comparer avec les données de 2010 et augmentent la base servant à dégager des tendances. Les données des prospections aériennes sont actuellement analysées ainsi que les données SST utilisées pour l'analyse spatiale. Un consortium composé de 13 institutions de recherche scientifique a été chargé de réaliser l'échantillonnage biologique et génétique et de procéder aux analyses de toutes les principales zones de pêche. Un autre consortium composé de six entités se charge actuellement du programme de marquage 2011 dans le golfe de Gascogne, le détroit de Gibraltar, la mer Méditerranée occidentale et centrale, afin de marquer près de 5.500 thons rouges juvéniles (âges 0-3). En ce qui concerne la modélisation, le GBYP se concentrera dans un premier temps sur l'analyse des risques visant à identifier les principales sources d'incertitude perçues se rapportant à l'évaluation et à l'avis, ainsi que sur l'élaboration de nouvelles évaluations et d'avis fondés sur divers jeux de données recueillis et sur les nouvelles connaissances acquises dans le cadre du GBYP.

[1] Coordinator ICCAT/GBYP – Calle Corazón de Maria 8, 6th fl. – 28002 Madrid, Spain.
[2] Assistant Coordinator ICCAT/GBYP – Calle Corazón de Maria 8, 6th fl. – 28002 Madrid, Spain.

RESUMEN

El Programa de investigación sobre atún rojo para todo el Atlántico (GBYP) comenzó oficialmente en octubre de 2009. La segunda fase de actividades del GBYP comenzó en diciembre de 2010 e incluía: (a) continuación de la recuperación/minería de datos y elaboración de dichos datos; (b) continuación de las prospecciones aéreas sobre concentraciones de reproductores;(c) muestreo biológico y genético y análisis; (d) marcado convencional, lo que incluye una campaña de concienciación y recompensas y (e) primeros pasos en los enfoques de modelación. Se reforzaron los recursos de personal del GBYP. Se recuperó una cantidad importante de datos de más de 24 millones de ejemplares de atún rojo, procedentes de 37.000 operaciones pesqueras desde el siglo XVI al siglo XX. Se han realizado prospecciones aéreas en las tres principales zonas del Mediterráneo (más de 276.000 km^2), con lo que se obtuvieron datos adicionales para compararlos con los de 2010, incrementando la base que se utilizará para detectar tendencias. Se están analizando los datos de las prospecciones aéreas, junto con los datos SST utilizados para los análisis espaciales. Se estableció un consorcio de trece instituciones científicas para realizar el muestreo biológico y genético y los análisis de las principales zonas pesqueras. Otro consorcio de seis entidades está realizando el programa de marcado de 2011 que cubre el Golfo de Vizcaya, el Estrecho de Gibraltar y el Mediterráneo occidental y central, con el objetivo de marcar 5.500 juveniles de atún rojo (edades 0-3). En términos de modelación, el GBYP se centrará inicialmente en un análisis de riesgo, para identificar las principales fuentes percibidas de incertidumbre relacionadas con la evaluación y el asesoramiento, y en el desarrollo de nuevas evaluaciones y asesoramiento basados en los diferentes conjuntos de datos que se están recopilando así como en los nuevos conocimientos que se están adquiriendo en el marco del GBYP.

KEYWORDS

Bluefin tuna, large pelagic species, ICCAT, research aerial survey, data recovery, tagging, Mediterranean Sea, Atlantic Ocean

1. Introduction

The Atlantic-wide Research Programme for Bluefin Tuna (GBYP) was officially adopted by SCRS and the ICCAT Commission in 2008, after a long process. In 2003, as an input of the Working Group established by Rec. 02-11, SCRS presented the Commission with a research plan to improve knowledge on bluefin tuna, with a special focus on mixing between the two stocks (ICCAT, 2004, Col. Vol. Sci. Pap. ICCAT, 56(3): 987-1003). The various research elements included in this first proposal are still pertinent today, even if some other activities have been included in the following years. During the Marrakech Commission meeting (2008), the SCRS chair met with all the scientists present at the meeting and a detailed proposal was forwarded to the Commission. The proposal was adopted by the Commission in plenary (ICCAT Report 2008-2009 (I), 1: 40) and resulted in a first official document, Res.08-06, which covered only the 2004 SCRS proposal but under a broader title. At the same time, the Commission approved the STACFAD Report (ICCAT Report 2008-2009 (I), 1: 42), which included the agreement to endorse the Atlantic-wide Research Programme (ICCAT Report 2008-2009, (I), 1, Appendix 10 to Annex 9: 284-287), establishing three priorities in 2009 (Coordinator, data mining and Aerial surveys), other action to be further discussed by SCRS in 2009 and the provision for the programme to be adjusted in the following years taking into account the evolution of its implementation and research needs. The total budget of the programme was estimated at about 19 million Euros in 6 years. The same document reports the engagement of the European Community and some other Contracting Parties to contribute to this programme in 2009 and in the following years.

The SCRS, in 2009, reviewed the updated research proposal submitted by SCRS chair, as it was discussed and presented to the Commission at its meeting in 2008 (ICCAT Report 2008-2009 (II), 1: 224 and ICCAT Report 2008-2009 (II), 2: 223-224). The SCRS indicated the priorities identified in the 2008 document, as follows:

a) Improve basic data collection through mining (including information from traps, observers, and VMS), developing methods to estimate sizes of fish caged, elaborating accurate CPUE indices for Mediterranean purse seine fleets, development of fisheries-independent information surveys and implementing a large scale well planned conventional and genetic tagging experiment;

b) Improve understanding of key biological and ecological processes through electronic tagging experiments to determine habitat and migration routes, broad scale biological sampling of live fish to be tagged and dead fish landed (e.g. gonads, liver, otoliths, spines, etc.), histological analyses to determine bluefin tuna reproductive state and potential, and biological and genetics analyses to investigate mixing and population structure; ecological processes, including predator-prey relationships;

c) Improve assessment models and provision of scientific advice on stock status trough improved modelling of key biological processes (including growth and stock-recruitment), further developing stock assessment models including mixing between various areas, and developing and use of biologically realistic operating models for more rigorous management option testing.

A number of Contracting Parties expressed a willingness to make extra-budgetary contributions to such a programme with a view towards initiation of activities in 2009 related to programme coordination, data mining, aerial surveys, and tagging design studies, with additional research activities to be undertaken in the following years.

The first phase costs were set at 750,000 Euros and voluntary contributions sufficient to initiate the year 1 activities were jointly committed by the European Community, United States, Japan, Canada, Norway, Croatia, Turkey and Chinese Taipei, while Morocco indicated its interest in future contributions. The provision to accept additional contributions from various entities and private institutions or companies was also agreed. In the same document, it was recommended that a Steering Committee be formed comprised of the SCRS Chair, the ICCAT Executive Secretary or his Assistant, the Bluefin Tuna Rapporteurs, and an outside expert with substantial experience in similar research undertakings for other tuna RFMOs, to guide and refine the Programme as necessary.

The first phase, officially initiated on October 22, 2009 for 12 months, had a prorogation of 2 months for completing the works already planned. The prorogation of the EC Grant agreement SI2.542789 was provided after a specific request by the GBYP Steering Committee thought an amendment to the agreement provided by the European Commission on October 10, 2010; the termination of GBYP-Phase 1 was set on December 12, 2010.

The report of the first phase was officially approved by SCRS (ICCAT Report 2010-2011 vol. 2, page 181 and appendix 6, p. 238-242), with specific recommendations to the Commission (ICCAT Report 2010-2011 Vol. 2, page 187), without any modification of the research plan adopted by the GBYP Steering Committee. The Commission adopted the SCRS report, including the endorsement of the GBYP activities (ICCAT Report 2010-2011, Vol. 1, page 2, 264 and 267). Several ICCAT CPCs confirmed their engagement for funding the GBYP, either with financial contributions or in-kind, but the SCRS recommendation to provide a dedicated quota for improving the financing of the programme was set aside, because it was not studied enough to be adopted by Panel 2 (ICCAT Report 2010-2011, Vol. 1, page 267). The costs of the second phase were set at 2,502,000 Euros.

Originally, the costs of GBYP Phase 2 were estimated at 3,390,000 Euros (ICCAT Commission, 2008), then they were set at 5,845,000 Euros (ICCAT Commission and STACFAD, 2009) and finally the GBYP Steering Committee in 2010 set them at 3,476,075 Euros (SC Report, 2010). The budget reduction, due to the availability of funding by the various CPCs, induced the cancellation of some research activities (i.e., eggs and larval survey) and the limitation of other research activities (i.e., tagging and biological sampling).

The second phase (12 months) officially initiated on December 22, 2010, after the signature of the Grant agreement for co-financing the GBYP Phase 2 (SI2.585616) by the European Commission. The co-funding was committed by United States, Turkey, Libya, Japan, Morocco, Canada, Norway, Croatia, Chinese Taipei and the ICCAT Secretariat. The provision to accept additional contributions from various entities and private institutions or companies was also confirmed and additional funds were provided, mostly in kind or specifically devoted to individual activities[3].

Most of the contents of this report were presented to the GBYP Steering Committee in June-July 2011 and were approved.

[3] Contributions to GBYP have been received from Asociación de Pesca, Comercio y Consumo responsible de Atún Rojo and from Grupo Ricardo Fuentes E Hijos S.A. Contribution in kinds have been received from Balfegó Grup, from Roberto Mielgo Bregazzi, from Es Sahel (Fuentes Group), from IEO Fengirola, from INRH Tangier, from Maromadraba SARL and from the WWF Mediterranean Programme.

2. Coordination activities

Phase 2 of the GBYP officially started on December 22, 2010, with the signature of the agreement between the European Community and the ICCAT Secretariat. A detailed weekly work-plan for 2011 was set-up in the very first period of this second Phase.

The call for tenders for recruiting the GBYP research assistant was launched at the early beginning of December (**Annex 1**)[4], after the final approval of the budget components by the ICCAT Commission. Fourteen (14) candidates were examined and the ICCAT-GBYP Selection Committee selected the four best and then, after the last evaluation, Dr. M'Hamed Idrissi was selected and he assumed his duties on 1 March 2011.

Another relevant activity at the early beginning of Phase 2 was the organisation of the various meetings planned in February, which required a huge effort for getting all the essential presentations by various scientists, and to get all the invited speakers at the right time. The participation of 44 scientists from 11 countries and the extremely positive comments received compensated all efforts and confirmed the positive reaction of the scientific community and stakeholders to the GBYP activities.

The coordination activities were mostly devoted to organise all the preliminary work for setting-up the various Call for tenders in agreement with the ICCAT Secretariat, organising the various Evaluation Committees after revising the various proposals in terms of fulfilling the requirements, and ensuring the follow-up activities (communication, contracting, monitoring, etc.). The coordination included also the continuous contact with the ICCAT Executive Secretary, the ICCAT Administration and the GBYP Steering Committee, organising all the necessary meetings and providing constant information about all the programme activities. The ICCAT Secretariat nominated Dr. Laurence Kell as internal focal point for the GBYP activities.

The Coordination staff and contracted or invited scientists who participated officially GBYP meetings are given in **(Table 1)**.

A duty of the GBYP is also to provide scientific support (on request) to the various national initiatives which are potentially able to increase the effectiveness of the GBYP and its objectives. For this reason, the Coordinator joined the Steering Committee for the bluefin tuna programmes of the NOAA, together with other members of the GBYP Steering Committee; in this function he participated in the evaluation session of the U.S. domestic research programmes for bluefin.

The Coordination staff had also the duty to monitor the various research activities carried out by the programme, mostly from the desk but also with field monitoring when possible. The first field control was carried out on July 8 to 11, 2011 in Ibiza, monitoring the aerial survey activity carried out in sub-area 1. This mission included more than 16 hour flight time on duty.

The coordination activity required a continuous and constant contact with many institutions and people: this resulted in more than 10000 e-mails in the last 7 months. According to the EC Grant Agreement, up to date, it was necessary to prepare 10 deliverables, for a total of 1167 pages. A total of 16 contracts were delivered, and several agreements for invited speakers and trainers were also issued. The administrative activity was very intense, with a continuous and constructive contact with the ICCAT Administrative Department.

In general, Phase 2 of GBYP is on the track, following the schedule according to the adjustments made by the GBYP Steering Committee and following the outputs of the meetings in February 2011. Where specific actions were concluded, the objectives were largely met, with the exclusion of the aerial survey, were external factors partly affected the work plan.

In conformity with the Atlantic-Wide Bluefin Research Programme (GBYP) adopted by the SCRS and the Commission for Phase 2, the following research initiatives have been conducted or initiated (see **Table 2**).

3. Data mining, data recovery and data elaboration

As usual, the first preliminary activity was conducted at the ICCAT Secretariat. An updated analysis of the ICCAT data base on bluefin tuna was carried out, with the purpose to identify the most relevant gaps in the data

[4] Available on request from the Secretariat.

series which are potentially useful for the stock assessment, taking into account the data already collected under GBYP Phase 1; this gap analysis was provided by GBYP to the SCRS Scientists and National statistical correspondents to help them in detecting the lacking data.

The first Call for Tender on this item was issued on January 26, 2011 (ICCAT Circular n. 318/2011) and it was limited to tuna trap data, also taking into account the need to have the results before the Symposium on Tuna Traps planned in May, 2011. Bids were submitted by three Institutes and all bids were retained and awarded, some after a negotiation for clarifying a few details (March 2 and 28, 2011). A common format for transmitting the data to the ICCAT Secretariat was provided to all the contractors, updating and improving the format already available in Phase 1, with the purpose to get the data "ready to use" and in a format allowing their more easy incorporation in the ICCAT bluefin tuna data base. The preliminary reports were provided on due time (April 15, 2011), as well as the draft final report (April 29, 2011) and the final report (May 7, 2011), allowing the GBYP to present the results of this part of the action **(Table 3)** during the Symposium on Trap Fishery for Bluefin Tuna in Tangier (May 23 to 25, 2011).

This first data recovery exercise was mostly a real data mining, because several ancient archives were explored and analysed by various teams. The collection covered possibly the most extensive data range among all RFMOs, including trap data from 1525 to 2010, for a total of more than 18 million specimens and about 20,000 fishing operations ("*Matanzas*") and a total 4,371 data on yearly catches/trap. This extremely important data recovery, due to the variety of data in the various archives, needs to be incorporated with a dedicated attention in the ICCAT bluefin tuna data base. The data will be analysed in a near future, making them available for further analysis and assessments.

The first use of these data was during the ICCAT/GBYP Symposium of Trap Fishery for Bluefin Tuna, held in Tangier (Morocco) from May 23 to 25, 2011, and included within the GBYP Data mining, data recovery and data elaboration activity. The Symposium was attended by 60 scientists (among them, 10 invited speakers), representatives of the industry and NGOs and 27 papers have been presented. The GBYP Coordination provided the Symposium with a comprehensive review of bibliography and iconography on tuna trap fishery. The Symposium was considered the most important on this ancient fishery never held in the world, also because it was possible to have an overview of some traditional trap fisheries from distant areas (Japan, United States, Canada), and assemble together very detailed information about historical, cultural, social, economic and fishery aspects of an activity which is the most ancient industrial fishery in the world, dating back at least 2600 years.

Several recommendations were provided by the Symposium and they will be examined by SCRS in October. One of them recommends ICCAT CPCs and all countries concerned by this fishery to start the procedures for including the Tuna Trap Fishery, the tuna trap buildings and the few remaining places where this ancient activity is still active among the UNESCO World Cultural Heritage, while there was also a general consensus in consider the tuna traps as "Tuna Scientific Observatories". The full report of the Symposium is available on the ICCAT page (http://www.iccat.int/Documents/Meetings/Docs/2011_BFT_TRAP_SYMP_REPORT_ENG.pdf), while the full activity was included in the Report on the ICCAT-GBYP Symposium on Trap Fishery for Bluefin Tuna (365 pages), provided to the EC on June 27, 2011, as one of the deliverables established within the Grant Agreement. It is also important to stress the recommendations concerning the standardization of the tuna trap data, which was one of the important points of the Symposium. For standardizing CPUE series from trap fisheries the Symposium recommended:

- ✓ Recording not only landed fish but also released fish from the traps.
- ✓ Keeping records of size and/or age information of the fish caught, and produce indices by age or age groups if there are changes in the size distribution of fish caught in the traps.
- ✓ Promoting regional-wide studies of the trends of catch rates at size-age from different tuna traps, and
- ✓ that further details be made available by national scientists, for better understanding of the natural fluctuations of the stock, and to improve the standardised CPUEs taking into account the most relevant variables.

The Symposium was also the opportunity to implement the first cooperative electronic tagging activity in Morocco, and this activity is reported in this report in section 4.4.

A second Call for Tenders was released on the same date of the first one, on January 26, 2011 (ICCAT Circular n. 320/2011). This Call received 6 bids. After a cross-check of the bluefin tuna data base, an internal review of the bids, and in strict consultation with the Steering Committee, only 4 over 6 all bids were accepted and the awards were provided on March 18 and March 28, 2011 along with the related contracts. The various proposed

data sets, actually missing from the bluefin tuna data base, concern a wide range of years and fisheries and should improve the knowledge on tuna fishery in various areas; a data mining will, be carried out by some contractors, on some additional data sets on tuna traps. The preliminary reports have been submitted in September, 2011, while the final reports shall be available after October 10, 2011. The preliminary number of data collected by the various contractors within this second round is shown in **Table 4**.

When all data obtained by the first set of contracts and the second set of contracts will be fully available at the ICCAT Secretariat, according to the general objectives of GBYP, these data sets will constitute the largest amount of data never obtained on bluefin tuna and the most important improvement of the ICCAT bluefin tuna database since its origin. The data will be incorporated in the ICCAT bluefin tuna database, through a revision procedure which includes a preliminary organization of the data according to the specific features (i.e., for "matanza" in the case of ancient and recent tuna trap data sets), which will allow a first preliminary statistical analysis. When all data sets will be incorporated in the ICCAT data base, then the ICCAT Sub-Committee on Statistics and then the SCRS Bluefin Tuna Species Group will decide how to use these data for the future assessments, according to the ICCAT procedures. After a very first overview of the data sets already available (the data from Phase 1 and the data collected with the first group of contracts in Phase 2. These data have two primary uses, i.e. to improve:

a) the standard assessment input files and reduce uncertainty in the assessment due to biases and other errors, and

b) knowledge on the stocks and fleet dynamics in order to develop a robust stock assessment and advice framework.

Therefore, under the GBYP modeling approaches programme, a review of these data will be made in order to assess the benefits for the current assessment framework and to recommend appropriate analysis and development of new methods.

A GBYP temporary staff person will help the ICCAT Statistical Department with the data input and preparation.

The elaboration of aerial survey data is included in this project activity item (according to the Phase 2 plan), because it concerns further data to be potentially used in future assessments if a sufficiently long data series will be collected over the years. According to the decision taken by the GBYP Steering Committee (June 27-July 1, 2011), it was decided not to issue a third Call for Tenders as was originally planned, but instead to provide a contract to the same team who made a satisfactory work in Phase 1, asking the team not only to elaborate on the aerial survey data from the 2011 activity, but also a more complex analysis to be conducted on the data from the last two years, with the purpose to develop recommendations on the minimum aerial survey design(s) required for use within a scientific management framework. This specific request was a consequence of the outputs from the Workshop on Aerial Survey in February and the following decisions by the GBYP Steering Committee. The contract was provided on July 28, 2011. According to the contract, the reports shall be provided by September 23, 2011 (analysis of 2011 data and preliminary recommendations) and by December 7, 2011 (full analysis, including the spatial one, and analysis of the additional variance, with full details), in order to have the approved final report before the end of GBYP Phase 2. The preliminary report has been provided in due time. This preliminary report includes the data analysis and the comparison with the first year data, as shown in **Table 5**.

While enforcing the decision taken by the Steering Committee about the elaboration of aerial survey data in 2011, it was necessary to obtain the Sea Surface Temperature (SST) data with the same resolution of 2010. For this reason it was decided to ask for updating to the same company who provided the SST data in GBYP Phase 1 and the agreement was reached on July 27, 2011. The SST data were delivered in two sets, the first (data from May to June) by August 3, 2011 and the final set (July 2011) by September 5, 2011. These SST data will allow the team working on the aerial survey data to provide their elaboration on spatial analysis on schedule. The potentialities of these data elaborations for research and management purposes are considered very important by SCRS, particularly working on multi-year data sets, on additional oceanographic parameters and refining the methodology year after year, because it is the first time that this type of detailed analysis of fishery independent data is possible in ICCAT.

4. Aerial surveys

The aerial surveys have the scope to provide fishery independent indices, concerning various fractions of the stock. The aerial surveys targeting spawning aggregations can potentially provide indices for the spawning stock

biomass, while aerial surveys targeting aggregations of juveniles can potentially provide indices for the recruitment. In all cases, surveys shall be conducted with a statistically sound design and for several years (depending on the CV levels identified) in order to get reliable indices.

After the experience in the first year, which demonstrated possibilities, limits and capacities of the aerial survey on spawners, providing the first estimates for the four areas surveyed the GBYP Steering Committee decided to organise a Workshop on Aerial survey for Bluefin Tuna, for having a general overview of the best practices on this particular technique around the world and discussing the best possible approach in Phase 2 and in the next years.

4.1 ICCAT-GBYP Workshop on Aerial Survey for Bluefin Tuna

The ICCAT-GBYP Workshop on Aerial Survey for Bluefin Tuna, decided by the GBYP Steering Committee on September 4-5, 2010, was approved by SCRS at its 2010 meeting and endorsed by the Commission at its 2010 meeting.

The Workshop was held at the ICCAT Secretariat in Madrid, February 14 to 16, 2011 and was attended by 44 scientists from various ICCAT CPCs, industry and NGO representatives, including 4 invited speakers. The high attendance was very useful for discussing many practical and theoretical issues about the aerial survey technique, showing the various approaches used in the few countries where the aerial surveys on marine animals are carried out (mostly on marine mammals, with a few activities on tuna species), the practical problems, the various designs and statistical approaches. The difficulties presented by the GBYP Aerial Survey were discussed in detail, particularly the aspects concerning the fact that the Mediterranean Sea is shared among 23 aerial spaces, managed by each country **(Figure 1)**.

The Workshop provided several recommendations, some of them to be immediately enforced in GBYP Phase 2. The GBYP Steering Committee held a meeting on February 18, 2011, immediately adopting some of the recommendations proposed by the Workshop (Distance method, survey restricted to June, mandatory use of bubble windows, two scientific observers on each aircraft, four areas to be monitored, use of geo-stabilised cameras if possible, aerial survey on juveniles to be encouraged on CPCs funds), moving others to SCRS for the aspects concerning the next years (extensive synoptic survey).

The full report of the GBYP Workshop on Aerial Survey is available on the ICCAT page (http://www.iccat.int/Documents/Meetings/Docs/2011_GBYP_WORKSHOPS_ENG.pdf), while the full details and the presentations were included in the GBYP deliverable “Report on the ICCAT-GBYP Workshop on Aerial Survey”, provided to the EC on March 11, 2011. The decision to organise a training course for the pilots, the professional spotters and the scientific spotter was confirmed, setting the date in May, after the Call for tenders, the selection of bids and the signature of the various contracts.

The GBYP set up general rules for standardising the aerial surveys to be conducted: all aircraft shall have upper wings, two engines and bubble windows (one per side), they shall operate at an altitude of 300 (with 10% tolerance) over the sea level and at a speed of 300 km/h (10% tolerance), and they shall have a GPS able to continuously recording the track and the related data. Each aircraft shall be identified by an ICCAT number in contrasting colour with the aircraft, on one lower side of the wings and on one side of the aircraft. In Phase 2, according to the outputs of the GBYP Workshop on Aerial Survey, each team on board shall include an expert pilot, a professional tuna spotter and two scientific observers. All sightings shall be properly recorded on a common form in excel (improved after the experience of the first year), to facilitate the data elaboration, and documented by photos.

4.2 ICCAT-GBYP Revision of the Aerial Survey Design for Phase 2

According to the discussions, the conclusions and the recommendations of the ICCAT-GBYP Workshop on Aerial Surveys (Madrid, February 14-16, 2011) and to the following decisions adopted by the GBYP Steering Committee on February 17, it was decided to revise the GBYP aerial survey design adopted in Phase 1, following the same methodological approach for providing a revised design to be used in Phase 2.

Preliminary work was done at the ICCAT Secretariat, using the VMS data from bluefin tuna purse seiners for the years 2008, 2009 and 2010, and it was very useful for better defining the boundaries of the various sub-areas, always taking into account the already existing knowledge on the biology and ethology of the eastern Atlantic bluefin tuna stock during the spawning season. This preliminary analytical work showed a major concentration

of fishing activity in the Balearic Sea, in the southern Tyrrhenian Sea, in the central-southern Mediterranean Sea and in the eastern Aegean Sea close to Turkish waters, with minor activities in other areas, while the activity in the Adriatic Sea was considered targeting non-spawners bluefin tunas. The fishing activity noticed in previous years close to the Nile Delta was not present in 2010 and then this area was not considered anymore.

After an internal discussion, taking into account the situation in several North African countries, and particularly the operational problems encountered by the companies engaged in the GBYP aerial survey in Phase 1 for obtaining the flight permits in the Syrian, Tunisian and Egyptian air space **(Figure 3)**, it was decided to modify the sub-areas 3, 4, 7 and 8 established in 2010, by cutting the eastern boundaries in the Gulf of Sirta from the previous sub-area 4, and by joining and reshaping the previous sub-areas 3, 7 and 8.

Due to the short time available and to the need to follow the same methodological approach adopted in Phase 1, it was decided to provide an amendment and an extension of the contract to the same team which was awarded in Phase 1 for making the aerial survey design and analysing the aerial survey data, because the ICCAT Secretariat is not equipped with the "DISTANCE" software tools and no ICCAT scientist was familiar with those tools.

Just before providing the amendment to the contract for the aerial survey design, proposed on March 17, 2011, there was a further deterioration of the situation in the North African area and then it was decided to ask for a design having two alternative scenarios, the first including the Libyan air space (with the new sub-areas 3CL and 4, **Figure 2**) and the second without the Libyan air space (with the new sub-area 3CM, **Figure 3**). The full report for the revised design in Phase 2, along with the new tracks for all areas, was submitted on March 21, 2011 and it was approved by ICCAT-GBYP after checking the contents at the Secretariat and it was included in the Deliverables.

The Report on the revision of the GBYP Aerial Survey Design for Bluefin Tuna Spawning Aggregations in 2011 includes all the details (edited April 28, 2011) and is available on the ICCAT-GBYP web page. It was also provided to the EU as one of the deliverables included in the Grant Agreement.

4.3 ICCAT-GBYP Aerial Survey for Bluefin Tuna Spawning Aggregations in Phase 2

According to the UN Security Council Resolution 1973/2011 on March 17, 2011, establishing a no-fly area in central-southern Mediterranean area (released on March 18 and enforced immediately after), and taking into account the various geo-political situations in other areas, it was decided to limit the GBYP Aerial Survey for bluefin tuna spawning aggregations to sub-areas 1, 2, 3CM and 6 and then the ICCAT Secretariat released the Call for tenders GBYP 05/2011 on April 5, 2011 (ICCAT Circular n.1309/2011), which was immediately posted on the ICCAT web site. According to this Call for Tenders, the bids for the GBYP Aerial Survey on Spawning Aggregations shall be submitted by April 22, 2011.

On April 22, 2011, ICCAT was informed by Turkey that the circular n. 1309/2011 had some distributions problem and requested a 10 days extension for submitting the bids. Due to time constraints and considering the time required to examine the bids and eventually negotiate the contract(s), the time required to hire the instructors for the training course, to organise it and to invite the participants, and the schedule to begin the aerial survey on June 1, 2011 (as was recommended during the Workshop on Aerial Surveys, point 5.2.2), it was agreed to provide a short extension for submitting the bids, by April 28, 2011 (midnight) (ICCAT Circular n. 1651/2011).

Four bids were submitted to ICCAT and after two meetings of the GBYP Selection Committee (29/04/2011 and 04/05/2011), three tenders were awarded. The contracts were provided in the following days and regularly signed.

The GBYP was informed about some possible potential problems in carrying out the aerial survey during the purse-seine fishing period. It was decided to carry out a preliminary exploratory work to check if sightings of spawners obtained in Phase 1 were extended also after June and the result was positive. The problem was presented to the GBYP Steering Committee and finally it was decided to carry out the survey from June 1 to 30, 2011, extending the period to July 10, with a different schedule by area. It was planned to begin the survey on June 7 in sub-area 6 (eastern Mediterranean Sea), on June 12 in sub-area 3CM (central Mediterranean) and on June 15 in sub-areas 1 (Balearic Sea) and 2 (south Tyrrhenian Sea); it was agreed to eventually anticipate the beginning of the survey if the quota will be reached before these dates by the fleets fishing in each of these areas. The three companies under contract agreed about the changes in the schedule.

The aerial surveys initiated on June 10 in sub-area 1 (the quota was reached on June 9, 2011), on June 20 in sub-area 2 (due to a technical problem to the aircraft), on June 12 in sub-area 3CM, while the aircraft was moved to sub-area 6 on June 11 on the basis of a landing permit issued by the local Authority.

The aerial survey in Phase 2 was done on schedule in sub-area 1, 2 and 3CM, while it was not conducted in sub-area 6. The aerial survey activity in Phase 2 was characterised by several difficulties which were impossible to consider in advance. Sub-area 1 was affected by many days of strong winds, which caused the request to extend the ending date by 5 days (agreed by the GBYP Steering Committee). The aircraft used in sub-area 2 had several mechanical problems, besides of the correct maintenance schedule and revision (checked by GBYP) and it was necessary to alternate two aircraft with the same characteristics. The aircraft operating in sub-area 3 CM was not able to fully cover all area due to security issues in southern Mediterranean; this limitation caused the reduction of the survey area, similar to the limitation experienced in Phase 1. All sightings are shown in **Figure 5**.

In sub-area 6 the Company in charge did not received the permit on time. The Turkish authorities delayed the permit until July 15, issued with conditions. As a consequence, this sub-area was not surveyed in Phase 2.

The impact of these external factors on the aerial survey conducted in Phase 2 will be eventually assessed by the team carrying out the data elaboration and this analysis will help understanding the importance of having a minimum level of survey acceptable for the time data series. The analysis of additional variance will also help in defining a minimum threshold for the following years with the purpose to develop recommendations on the minimum aerial survey design(s) required for use within a scientific management framework.

Following the experience of Phase 1, it was decided to continuously monitor the sea surface temperatures (archive data are available at 5 m depth) and waves, with the purpose to have a better understanding of the various operational and environmental situations during the aerial survey campaign in 2011. The maps have been collected daily from the site:

http://gnoo.bo.ingv.it/mfs/Forecast/bulletin.htm?link=F for the sea surface temperatures;

and from:

http://isramar.ocean.org.il/isramar2009/wave_model/default.aspx?region=coarse&model=wam for the waves **(Figure 4)**.

The Coordination staffs were also in charge of possibly monitoring the aerial survey activity on field. The first field control was carried out by Dr. M'Hamed Idrissi on July 8-11, 2011, in Ibiza, monitoring the aerial survey activity carried out in sub-area 1 (Balearic Sea). This mission included more than 16 hour flight time on duty.

The aerial survey on spawning aggregation in 2011 was affected not only by some complicated operational problems, but also by the unusual situation in terms of temperatures and winds. The surface temperature was unusually very hot at the beginning of the potential spawning period (May) in the Tunisian waters and in the eastern Mediterranean. Waters became wormer even in the western Mediterranean, close to the Balearic area, well in advance of the usual average time. The waters in southern central Mediterranean had a serious delay in reaching the right temperature for spawning, possibly due to the strong winds that characterized this part of Mediterranean in late spring 2011. It was very interesting to notice a large part of warm surface water in the Ionian Sea, reaching also the coasts of Cirenaica (Libya) and creating an unusual area for spawning in this large portion of the Mediterranean Sea. The winds arrived in the western Mediterranean in June created problems for keeping the warm water at the surface, while winds affected also the first part of the season in the southern Tyrrhenian Sea and several days in the eastern Mediterranean.

It is possible that the wind, in presence of marginal optimum temperature for spawning (>20.5°C), prevented the thermocline to be established at the right depth in various Mediterranean areas during part of the season. At the moment, it is not clear if and how these environmental factors had any impact on the sightings made by the various teams working for GBYP in the three selected areas in the Mediterranean Sea. Full details should be available later, when the spatial analysis will be finalised. The contract for elaborating on the data collected in the GBYP Aerial Survey in 2011 is detailed in the last part of section 3 of this report.

The final reports on aerial survey were submitted by tenders by July 31, 2011, while the preliminary reports were submitted by June 20. The full activity is going to be reported to EC by the Deliverable C4, while the individual reports will be available on the ICCAT-GBYP web page after their final approval.

4.4 ICCAT-GBYP Training Course for Aerial Survey on Bluefin Tuna Spawning Aggregations

Following the decision taken by the GBYP Steering Committee, the ICCAT-GBYP Aerial Survey for Aerial Survey on Bluefin Tuna Spawning Aggregations was held at the ICCAT Secretariat on May 17-18, 2011. The training was a mandatory request for all the personnel engaged in the GBYP aerial survey activity in 2011.

The course was held by three trainers: two invited speakers (Dr. Ana Cañadas and Dr. Gregory Donovan) and the GBYP Coordinator. The GBYP Training Course was attended by 20 people (pilots, professional spotters and scientific spotters) and by the GBYP Assistant Coordinator. All practical aspects of the aerial survey activity were discussed in great detail, including also the administrative ones. The reporting forms were improved and updated during the Course. The Deliverable C2 ("Report on ICCAT-GBYP Training Course for Aerial Survey on Bluefin Tuna Spawning Aggregations", 79 pages) includes all the details and the presentations provided during the training. It was delivered to the EC on June 27, 2011.

4.5 ICCAT-GBYP plans for the Aerial Survey on Bluefin Tuna Spawning Aggregations in Phase 3

The ICCAT-GBYP Workshop on Aerial Survey for Bluefin Tuna, followed by the GBYP Steering Committee on September 4-5, 2010, and by the last Steering Committee meeting on June 27 to July 1, 2011 set the general plan for the GBYP Aerial Survey activities in Phase 3 (2012).

It was decided in principle to conduct a comprehensive survey on all the potential spawning areas in the Mediterranean Sea, possibly with different intensity taking into account the previous monitoring. The discussions during the last meeting of the GBYP Steering Committee took into account all the difficulties experienced in Phase 2 and one of the major decisions was to ask the same team engaged in elaborating on the aerial survey data (see point 3.0 and point 4.3) to provide a draft with one or more hypothesis and designs of the minimum acceptable coverage for use within a scientific management framework, and analyse the power to detect population trends that considers additional variance. These products will be essential tools for the discussion at the SCRS for setting-up the aerial survey programme and the correspondent budget figure in Phase 3. According to a very preliminary analysis, it should be necessary to cover a minimum transect distance of 200,000 km per year for a minimum of 7 years for detecting a 10% recovery with 0.15 CV, which is about five time the current effort.

It is very clear that a comprehensive aerial survey in Phase 3 should face many additional problems, including sharing the Mediterranean in several sections for having a real time contemporary coverage, balancing the design with the available budget (but only within certain limits, below which the survey will not be able to provide the necessary data), getting all the necessary permits well on time, dealing with the various domestic regulations, assigning the contracts to tenders well before in the season, and organising a workshop and a training course on a very short advice. Most of the potential problems will be related to the possibility of getting the necessary permits in all necessary areas.

According to the experience in 2011 and to the discussions and decisions adopted by the GBYP Steering Committee in the meeting held on June 27 to July 1, 2011, it shall be necessary to have officially a preliminary engagement by all CPCs concerned by the GBYP aerial survey activities in Phase 3 during the next Commission meeting, including the preliminary information about any specific domestic obligation to carry on board a national observers, because this fact shall implies various operational problems, including, among others, the participation of these observers in the mandatory training course and consequences on the practicality of the rotation among observers decided by the Steering Committee for Phase 3.

5. Tagging activity

According to the general programme, it was planned to begin the tagging activity in GBYP Phase 2, including a preliminary operational meeting and then a field activity with conventional tags and PITs.

5.1 Tags and correlate equipment

Due to the very short time available and to the long time required for obtaining the tags and various associated materials, since the beginning of Phase 2 there were several contact with the few producers of spaghetti tags, PITs and PITs readers, with the purpose to place the orders and get the tags on time for the tagging season. The first order was placed for the 50 PIT readers of two types (on February 2, 2011) and for 1,000 food-safe type

PITs (February 15, 2011), with the objective to distribute the readers to the ROP observers controlling the cages and to the national observes in traps. The conventional spaghetti tags (10,000 Dart single barb FT-1-94), including two additional types for double tagging (8,000 small head double barb FIM-96 and 2,000 big head double barb BIM-96), with the sufficient number of applicators of the three types (400+300+200), were ordered on February 2, 2011.

The delivery of the conventional tags and the applicators was seriously delayed due to printing and production problems by the supplier and procedural problems at the arrival. The applicators for the 2-barbs tags were partly received on July 22, 2011.

5.2 Operational Meeting on Bluefin Tuna Tagging

The activity at the early beginning of Phase 2 included also the organization of the ICCAT-GBYP Operational Meeting on Tagging for Bluefin Tuna, decided by the GBYP Steering Committee on September 4-5, 2010, approved by SCRS in its 2010 meeting and endorsed by the Commission in its 2010 meeting. The GBYP Steering Committee on February 17, 2011 decided some additional issues that were discussed during the Operational Meeting.

The Meeting was held at the ICCAT Secretariat in Madrid, on February 18, 2011 and was attended by 42 scientists from various ICCAT CPCs, industry and NGOs representatives, including 2 invited speakers. The GBYP Tagging Design:

http://www.iccat.int/GBYP/Documents/Annex%201.%20Tag%20design%20report_fin_rev.pdf

and the Tagging Manual:

http://www.iccat.int/GBYP/Documents/ICCAT%20GBYP%20TAGGING%20MANUAL_fin_rev.pdf

were discussed in detail during this meeting and some additional refinements were required. The high attendance was very useful for discussing many practical and theoretical issues about the tagging activity in 2011 and in the next years. The recommendations included the indication to limit tagging in the first year to juvenile tunas and the request for double tagging 40% of the tagged individuals, for studying the retention rate of the various types of tags. These indications were endorsed and adopted by the GBYP Steering Committee.

The full details and the presentations were included in the in the Report on the ICCAT-GBYP Operational Meeting on Tagging, provided on March 11, 2011; the detailed report was also delivered to the EC as Deliverable D1.1, within the Grant Agreement.

5.3 PIT tagging issue

On February 23, 2011, the Japanese Delegation informed the Secretariat that there is a legal issue about PIT tags and the tagged fish cannot be enter on the Japanese market, because the Japanese domestic Food Sanitation Act No. 233 on December 24, 1947, on Chapter II ("Food and additives", art. 6, point 4, prohibited the import, trade, processing and cooking of food having external substances`. PITs were considered as prohibited substances by the Japanese Delegation. Following this official communication, the GBYP Coordinator informed the Steering Committee that the tagging design, delivered just the previous week and discussed during the operational meeting, included the PIT tagging (with a very precautionary implant of the food-safe tags in a part of the body usually not consumed for food) and that the information provided by the Japanese Delegation necessarily implies changes in the activity in Phase 2. Consequently, the decision to stop the PIT tagging in Phase 2 was officially taken and the EC was informed about this important modification of the original plan on the same day (February 23, 2011).

The tentative to block the orders already placed was partly successful, because the PIT readers were already shipped and it was not possible to stop the procedure, while it was possible to cancel, without any additional cost, the order for the food-safe PITs. The PIT readers are now stored at the ICCAT Secretariat and the Steering Committee is looking forward to reopen the discussion, on a documented basis. The GBYP Steering Committee, in his meeting held on June 27 to July 1, 2011, decided to resume the PIT tagging situation, asking the Coordinator to contract a specialist in PITs for providing a summary report about the "state of the art" for the use of PITs with a particular attention to the food-safe aspects.

5.4 Electronic tagging

Electronic tagging was excluded from the activity in GBYP Phase 2, due to budget constraints, even if it was originally included in the programme before the budget reduction in 2010. Following the indications provided by the Operational Meeting on Tagging and by the GBYP Steering Committee, it was tried to set also a complimentary electronic tagging activity at the beginning of the season, with the purpose to identify the course of tunas moving into the Mediterranean for spawning and also for trying to get the opportunity to use any of these fish coming into one of the areas where the aerial survey was planned for calibrating the results of the aerial survey.

Thanks to a very difficult and intense activity by the GBYP Coordination staff and to the kind availability of various entities (the Département de la Pêche Maritime du Maroc, l'Institut National de Recherche Haulieutique de Tangier, the Ricardo Fuentes e Hijos S.A., l'Association Marocaine des Madragues), it was possible to organise an extraordinary tagging activity by PATs, carried out by the WWF Mediterranean Programme (which provided 10 tags and the specialized staff) and the Instituto Español de Oceanografia, Fuengirola (which provided 3 tags and the specialized staff).

The activity was carried out on May 26 and 27, 2011, just after the GBYP Symposium on Trap Fishery for Bluefin Tuna, in the tuna trap of El Sahel (Tangier), with the presence of Dr. Mauricio Ortiz (ICCAT Secretariat), and it was very successful, because it was possible to implant 11 tags. One of the tagged tuna died after a very short time, while another was caught after only one day by another trap; these pop-up tags were recovered. Four tags detached prematurely in the following weeks, showing-up in the Atlantic Ocean west of Gibraltar. One of these four specimens showed unexpected movements westwards off the coast of Portugal. Just while preparing the report WWF provided the information that other two tags detached prematurely (after 52 and 54 days). Both showed that these specimens moved towards the Canary Islands and one then moved towards the Azores; no one of these six tunas entered into the Mediterranean Sea. It is planned that the other PATs should pop-up after 250 to 300 days from the implant.

This very first electronic tagging in this area is providing very new and unexpected information and data about bluefin tuna movement, even if the data should be further checked and confirmed.

5.5 Conventional tagging

The Call for Tender for the Tagging Activity (GBYP 07/2011, ICCAT Circular n. 2115) was issued on May 12, 2011 and only one bid was received; it was submitted by a Consortium including 6 Spanish public and private entities. The GBYP Evaluation Committee required a series of adjustments and clarifications to the tender, but they were considered unsatisfactory. On June 15 the proposal was officially not awarded and it was decided to release a new Call for Tenders (GBYP 08/2011, ICCAT Circular n. 2701, dated June 16, 2011). Again, only one bid was presented, coming from the same Consortium which submitted the bid under the previous Call. This second time the GBYP Evaluation Committee (July 8, 2011) considered the bid fulfilling the requirements and decided to award it. The draft contract, after a preliminary discussion for examining some administrative issues, was delivered on July 29, 2011.

A largely sufficient number of conventional tags of the three types and the available applicators of the three types were immediately forwarded to the Consortium, with the purpose to help the distribution process and avoid any possible delay.

The tagging activity is carried out on juvenile bluefin tunas (age 0 to age 3) in the Bay of Biscay by bait-boats (about 1250 tunas), in the area of Gibraltar by bait-boats (about 1250 tunas), in the western Mediterranean by a purse seiner (about 1250 tunas) and in the central Mediterranean by a purse seiner (about 1250 tunas). A complementary tagging activity will be carried out, on opportunistic basis, by the sport fishermen (possibly 500-700 tunas).

Due to the late delivery of the contract, the interim report on tagging activity and tag recoveries (originally set for the end of July, 2011) was delivered before the SCRS meeting. The tagging activity was partly conditioned by rough weather in some areas and by operational difficulties. According to the report, about 2000 tunas have been tagged to date, with 40% double tagging, while the tagging activities are still going on in various areas and should be completed before the end of the year.

5.6 Tag awareness campaign, tag reporting and tag recovery activities

These activities are considered essential for improving the very low tag reporting rate existing so far in the eastern Atlantic (about 5%) and the Mediterranean Sea (about 1%).

According to the decision taken by the GBYP Steering Committee in its meetings (September 4-5, 2010, September 10-12, 2010, February 17, 2011, June 27-July 1, 2011), it was decided to issue a Call for tenders for providing GBYP with the essential communication tools (logo, slogans, T-shirt design, posters designs, leaflets designs). The Call for Tenders ICCAT-GBYP 09/2011 was released on July 28, 2011 (ICCAT Circular no. 3338/2011). The bids arrived to ICCAT on September 1, 2011 and the one selected was awarded on September 12, 2011, limited to the logo and the posters **(Figure 6)**. The GBYP is working to find the way to finalise the process for all products within 2011.

In the meantime, the GBYP Coordination already started to work on various contacts with various stakeholders (fishers' organizations, sport fishermen organizations, NGOs), several advisory bodies in the fishery sector (RAC-MED, ICES, etc.) and further contacts will be developed as soon as the campaign material will be available. The plan includes the participation to several meetings where it is possible to directly contact the various stakeholders, including the other RFMOs active in the ICCAT Convention area (CECAF, NAFO, GFCM). A first meeting with RAC-MED was held on September 21, 2011 in Malta.

The preliminary contacts resulted in some tag recoveries, including two archival tags from Italy (one recovered by WWF and the other directly reported to ICCAT, who provided the regular monetary reward), and five conventional tags (two from Morocco and three from Italy). These few tags, a very initial and limited step, confirm that information, awareness and rewards are key issues for the success of a tagging campaign. The campaign will be developed in parallel with the tagging activity.

The campaign will be not an easy one, because it is necessary to prepare information material in several languages (English, French, Spanish, Arab, Italian, Portuguese, Greek, Turkish and Japanese) able to cover most of the needs in a large part of the ICCAT Convention area, and should be attractive for people over a large range of cultures and education.

The rewards issue presents several practical problems and these have been analysed and examined by the GBYP Steering Committee and the Coordinator during the last meeting (June 27-July 1, 2011). Preliminary exploratory contacts were established with VISA Europe, to assess the possibility of having a stock of pre-paid cards for basic monetary rewards (20 Euros each), but the limited amount of money available does not allow this type of operation, while it is possible to explore this possibility with other companies (i.e., other pre-paid card circuits, Carrefour, El Cortes Inglés, etc.). The high-quality T-shirts, with a nice design, are still considered a well-accepted reward by many stakeholders, even if additional delivery costs shall be considered.

High level rewards have been decided by the GBYP Steering Committee for the recovery of each electronic tag (1000 Euros) or for additional prizes for the annual ICCAT Tagging Lottery (an annual prize of 1000 Euros for the first tag drawn and two prizes of 500 Euros each, respectively, for the second and third tags drawn, having a GBYP code, to be delivered during the ICCAT Tagging Lottery; in case the number of tags having a GBYP code is not sufficient, then all the other ICCAT recovered tags from bluefin tunas will participate in the annual lottery).

It is also considered very important to provide immediate feedback to the tagging teams and the tag recovery person, informing both of the history of each tag. This fact will imply additional work for the GBYP Coordination staff, but this feedback is essential for improving cooperation.

The strict cooperation with the ICCAT Regional Observer Programme is another import part of the tag reporting activity, because observers are able to check over 70% of the bluefin tuna catches (in weight) and then this is a very good opportunity for increasing the reporting rate. For the meeting with ROP see section 5.4.

6. Biological and Genetic Sampling and Analysis

According to the general programme, it was planned to begin the biological and genetic sampling and analysis activity in GBYP Phase 2, including a preliminary operational meeting and then a field activity and a laboratory analyses activity until the end of Phase 2.

A parallel and almost twin research activity was initiated by the US and particularly by NOAA and NMFS, using domestic funds, particularly dealing with the western Atlantic stock of bluefin tuna. Four projects were selected and three of them are related to: (1) biological sampling; (2) otoliths chemical tracers; and (3) genetic population structure. As mentioned above in section 2, the GBYP Coordinator participated in the U.S. evaluation panel. The results of these studies are supposed to be submitted also to SCRS, after the U.S. domestic review and approval procedure.

6.1 Operational Meeting on Biological Sampling for Bluefin Tuna

The activity at the early beginning of Phase 2 included the organization of the ICCAT-GBYP Operational Meeting on Biological Sampling for Bluefin Tuna, decided by the GBYP Steering Committee on September 4-5, 2010, approved by SCRS at its 2010 meeting and endorsed by the Commission at its 2010 meeting.

The Meeting was held at the ICCAT Secretariat in Madrid, on February 17, 2011 and was attended by 42 scientists from various ICCAT CPCs, industry and NGOs representatives, including 1 invited speaker. A short practical training course for sampling otoliths in medium-large bluefin tunas was organised in the first part of the meeting, thanks to the kind availability of Dr. Sakai Osamu, to the tuna heads kindly provided by the Balfegó Grup and the logistic assistance by the Instituto Español de Oceanografia. Some manuals were distributed to the participants and several of them directly tested they ability to extract otoliths from large tuna heads. Research and practical needs were deeply discussed, including those for genetic sampling. It was clearly pointed out the impossibility to complete all the analytical work within Phase 2, because of time constraints and it was decided to collect the necessary number of samples independently from the analytical time needs, because samples which cannot be analysed in Phase 2 can be preserved and then analysed in Phase 3. The participants agreed about a list of areas and fisheries to be sampled and the requirement for a biological sampling design. It was also agreed that the biological sampling does include also the genetic sampling and the analytical work for both. It was discussed the opportunity to have a field coordination of all biological and genetic sampling and analysis activities, to work side-by-side with GBYP Coordination, and a Consortium structure was identified as the best possible solution for carrying out this job.

The GBYP Steering Committee on February 17, 2011, held just after the Operational Meeting, endorsed several recommendations and took the necessary decisions. One of these, having immediate effects, was the request to have a “Biological Sampling Scheme”, to be used to more precisely establish the sampling levels in the various areas and fisheries in Phase 2 activity.

The full details and the presentations were included in Report on the ICCAT-GBYP Operational Meeting on Biological sampling for Bluefin Tuna, provided on March 11, 2011 to the EC as one of the deliverables of the Grant Agreement.

6.2 Biological Sampling Scheme

Following the decision adopted by the GBYP Steering Committee on February 17, 2011, a Call for Tenders for the Biological Sampling Scheme was issued on March 11, 2011 (ICCAT/GBYP 03/2011, ICCAT Circular no. 903/2011). Only one bid was submitted and the GBYP Evaluation Committee awarded it on March 28, 2011, to a team of scientists under the coordination of the Institut National de Recherche Haulieutique (Morocco).

The report was provided in due time, on March 31, 2011, but some slight improvements and a few changes were required by the ICCAT Secretariat and the final version was provided on April 14, 2011; this final version is available on the ICCAT-GBYP web site:

http://www.iccat.int/GBYP/Documents/Biological_Sampling_Plan_GBYP_2011.pdf.

The “Biological Sampling Scheme” (which was provided under a very cost-effective contract) was not originally included among the tools of the actions of this GBYP activity but, as a matter of fact, it is a basic tool both for issuing a more focused and detailed Call for tenders for the Biological and Genetic Sampling” and for having a general reference about the various levels of sampling required in all bluefin tuna areas and fisheries.

6.3 Biological and Genetic Sampling and Analysis

The Call for Tender for the Biological and genetic Sampling and Analysis (GBYP 06/2011, ICCAT Circular n. 1727/2011) was issued on April 27, 2011 and only one bid was received; it was submitted by a Consortium including 13 entities from 7 different countries and a wide range of experiences. The GBYP Evaluation

Committee required a series of adjustments and clarifications to the tender, but they were considered unsatisfactory in a first step. More details and adjustments were provided in a second step. Finally, the GBYP Evaluation Committee (May 27, 2011) considered the bid fulfilling the requirements and decided to award it, but asking for a few additional details to be provided before the preparation of the contract. The particular structure of the Consortium and the bureaucratic requirements took some time for the preparation of the contract, which was signed on July 14, 2011. For this delay, taking into account the practical logistic needs and the fishing season, it was decided to admit all documented costs strictly related to the activity between the data of award and the signature of the contract.

Taking into account that some areas and fisheries included in the "Biological Sampling Scheme" cannot be sampled, due to concurrent geo-political factors, the sampling activity under contract includes now a total of 1950 samples, including 50 larvae, 1300 for genetic tissue, otoliths and spines, and 600 for genetic tissue, otoliths, spines and gonads.

The interim report on biological and genetic sampling and analysis was submitted on September 24, 2011 and it will be available soon. About 900 tunas have been sampled at the date and sampling will continue until the end of 2011.

6.4 Meetings with the ROP

The opportunity to use the ICCAT observers operating at tuna farms within the Regional Observer Programme (ROP) for biological sampling and for tag reporting was considered by the GBYP Steering Committee and the GBYP Coordination. A first meeting with the ROP was organized at the ICCAT Secretariat on March 8-9, 2011. As concerns the tag recovery, tags shall be reported directly by each observer to GBYP, informing in copy the ROP responsible. It was discussed the possibility for the observers to help in collecting biological samples, assisting the team contracted by the GBYP. It was decided that the team in charge will contact directly the observers in the various areas, keeping informed both the GBYP and the ROP responsible. Any necessary equipment shall be provided by the team in charge of the biological samples. The GBYP Coordination provided the ROP with copies of the protocols.

The GBYP coordination, together with the ICCAT Secretariat, is maintaining the contacts between the two consortiums in charge of the biological sampling and tagging and the ROP observers, for strengthening the cooperation and providing opportunities.

7. Modelling approaches

The ICCAT-GBYP activity on Modelling Approaches in Phase 2 is strictly following the course decided by the GBYP Steering Committee, endorsed by ICCAT-SCRS and approved by the ICCAT Commission, reflected on the EC Grant Agreement SI2:585616.

After many consultations among the SCRS Chair, the BFT Rapporteurs, the WG Chair and the ICCAT Secretariat, the ICCAT Working Group on Stock Assessment Methods (WGSAM) was postponed from the original date of March 21-24, 2011 and instead held on June 27- July 1, 2011. One day (June 28) was devoted to the bluefin tuna issues. The report of this meeting is still not available.

Therefore to ensure that modelling work would be started this year, the GBYP issued a Call for Tenders 2011 on Stock Assessment Modelling for a first set of contracts (GBYP 04/, ICCAT Circular n.954/2011 issued on March 15, 2011). These were: a) one contract for a risk analysis to identify the main perceived sources of uncertainty related to assessment and advice, and, b) two contracts to help develop new assessment and advice based on various data sets being collected and the new knowledge being gained under the GBYP. Unfortunately, only one bid was received for the second theme. The GBYP Selection Committee (April 5, 2011) decided to award two contracts.

The two contractors were invited to the ICCAT Working Group on Stock Assessment Methods (WGSAM) and, according to the contract duties, they provided a first preliminary overview of the work they are carrying out under the GBYP contract. Some additional work on a management strategy evaluation (MSE) framework to analyze the robustness of the current, VPA-Adapt based implicit management procedure, was carried out by Dr. Laurie Kell (ICCAT Secretariat). This work was conducted during an operational meeting held in Sete (France), on June 13-17, 2011, with the participation of Dr. Jean-Marc Fromentin and Dr. Sylvain Bonhommeau, organized by GBYP with the purpose to cover the gap caused by the lack of bids for the second theme of the Call for Tenders.

The results of the Risk Analysis will be presented at the SCRS and used to inform discussion on the "Unquantified Uncertainties". Where appropriate they may be used to specify what scenarios to include in any MSE work conducted in later phases. The example assessment and management procedure present by the first contractor included many elements that would be important in building a robust advice framework taking advantage of new data and knowledge made available under the GBYP. These will have to be further developed in later phases before they can be utilised in providing management advice. The preliminary MSE framework showed how the data and knowledge gained under the GBYP can be used to develop alternative robust advice frameworks. However, much work still needs to be conducted in later phases before such and advice framework can become operational.

The full report was included in the Deliverable F1.1, "Report on the ICCAT-GBYP Modelling Approaches", provided on July 12, 2011 to the EC within the Grant Agreement obligations.

Under GBYP Phase 3 the modelling themes will evaluate how to integrate the new knowledge and data being gained under GBYP into a robust advice framework. A major objective is to provide advice that can better meet management objectives and reduce risk.

A major tool will be Management Strategy Evaluation (MSE). This will allow the effect of uncertainty, both those already quantified in current advice and also the "unquantified uncertainties", to be evaluated. This will require the development of a simulation or Operating Model (OM) that can be used to test the current advice framework and alternatives that use the knowledge and data from GBYP. To do this will require coding in R the current stock assessment and advice software and implementation of novel alternative approaches. That will allow them to be compared in an objective way prior to implementation and for the SCRS and Commission to fully consider the risks and benefits of various alternatives. Having identified appropriate approaches these will be further developed under phases 4 and 5, once they are used to provide a new advice framework and once the necessary data are available.

8. Definition of GBYP Publication Policy, Editorial and Data Rules

The GBYP publication policy, along with editorial and data use rules adopted in Phase 1 were updated by the GBYP Steering Committee during the last meeting (June 27-July 1, 2011). They are attached here as **Annex 2**.

9. Steering Committee Meetings

The GBYP Steering Committee is now composed by the Chair of SCRS, Dr. Josu Santiago, the BFT-W Rapporteur, Dr. Clay Porch, the BFT-E Rapporteur, Dr.. Jean-Marc Fromentin, the ICCAT Executive Secretary, Dr. Driss Meski, and an external expert, Dr. Tom Polacheck, who was contracted for this duty.

The Steering Committee members have been constantly informed by the GBYP about all the initiatives and consulted by e-mail on many issues.

The first meeting of the Steering Committee in Phase 2 was hold at the ICCAT Secretariat on February 17, 2011. The draft agenda for the meeting was prepared by the GBYP Coordinator in consultation with the ICCAT Secretariat and distributed to the Steering Committee for comments. The Steering Committee discussed about the coordination activity, the budget, the aerial survey, the tagging programme, the biological sampling, the data recovery and data elaboration, the modelling approaches, the milestones and deliverables. The report is available on the ICCAT-GBYP web page.

The second meeting was on June 27 to July 1, 2011, at the ICCAT Secretariat. The draft agenda for the meeting was prepared by the GBYP Coordinator in consultation with the ICCAT Secretariat and distributed to the Steering Committee for comments. An annotated agenda, with all the necessary information was also distributed to the Steering Committee. This meeting discussed the very complex situation of the various activities and the various problems and for this reason it was necessary a long discussion, including an audio/video conference with some members who were not in Madrid. The report is available on the ICCAT-GBYP web page.

10. Agreements and donations

The Atlantic-wide Research Programme for Bluefin Tuna is a very complex programme and its activities concern all stakeholders. As a consequence, the GBYP needs the cooperation of all stakeholders and all

countries to fulfil its duties in the best possible way. This need was perfectly identified by SCRS and the Commission during the preliminary evaluation of the Programme.

Therefore, GBYP is managing to work with all stakeholders, making them aware of the programme and its activities and getting them directly involved when necessary. This approach is creating a favourable environment for GBYP, and one of the best proof was the tagging activity carried out in Morocco in Phase 2, when it was possible to reach a very difficult but extremely productive agreement among Stat institutions, research Institutes, tuna industry and an NGO, who worked all together with the only and clear objective to get neutral fishery independent data on tuna behaviour.

An agreement of collaboration for research activities to be developed under the GBYP and particularly on tagging was established with the WWF Mediterranean programme on April 28, 2011.

GBYP, in the last part of Phase 1 and in all this first part of Phase 2, continued to work constantly on this diffused network. This activity helped the Programme to get donations, which sometimes was destined for a precise activity:

- ✓ Asociación de Pesca, Comercio y Consumo Responsable de Atún Rojo: Euros 6,000.00 (for GBYP).
- ✓ Grupo Ricardo Fuentes e Hijos S.A.: Euros 10,000.00 (for the Symposium on Trap Fishery).
- ✓ Roberto Mielgo Bregazzi, donation in kind of Euros 175,000 individual tuna data from auctions, estimated value: Euros 50,000.00 (for GBYP data Recovery).
- ✓ Grup Balfegó, donation in kinds of tuna heads prepared for sampling otoliths; estimated value: Euros 300,00 (for the GBYP Operational Meeting on Biological Sampling).
- ✓ WWF Mediterranean Programme, donation in kinds of 8 PATs, analysis and logistics in Morocco; estimated value: Euros 27,200.00 (for GBYP Tagging).
- ✓ Maromadraba SARL and Es Sahel (Fuentes Group), donation in kind of divers working time, vessels support and sailors, for tagging in Morocco; estimated value: Euros 3,000.00 (for GBYP Tagging).
- ✓ Association Marocaine de Madragues, donation in kinds of a social dinner in Tangier; estimated value to be defined (for the Symposium on the Trap Fishery).
- ✓ Instituto Español de Oceanografia, Fuengirola, donation in kinds of 3 PATs and staff assistance for tagging in Morocco: estimated value to be defined (for GBYP Tagging).
- ✓ Institute National de Recherche Haulieutique, Tangier, donation in kinds of logistic support and staff assistance for tagging in Morocco: estimated value to be defined (for GBYP Tagging).

11. GBYP web page

The ICCAT-GBYP web page, which was created in the last part of Phase 1, is usually regularly update with all documents produced by GBYP; in some cases, due to the huge workload, some set of documents are posted all together. The updating includes also the budget page, where all contributions (monetary of in kinds) are regularly listed, to ensure a full transparency.

12. Recommendations

The GBYP Steering Committee and the various meetings provided a list of recommendations on various issues; several of them are essential for fulfilling the duties. The various recommendations will be evaluated by the SCRS Species Group in September and then by the SCRS Plenary in October. Those which will be retained will be proposed to the Commission in November.

13. Deliverables

The list of the deliverables produced in this first part of GBYP Phase 2 according to the EC Grant Agreement SI2.585616 is provided at the end of this report.

14. Acknowledgments

The GBYP would like to warmly acknowledge the very supporting efforts made by all the colleagues of the ICCAT Secretariat staff to allow the Atlantic-Wide Research Programme for Bluefin Tuna to stay on schedule, besides of the short time available to carry out all the necessary duties, sometimes under a very short notice.

The GBYP also acknowledges the strong collaboration of the GBYP Steering Committee, who responded very often in real time, particularly on very difficult scientific and practical issues.

This work was carried out under the provision of the ICCAT Atlantic Wide Research Programme for Bluefin Tuna (GBYP), co-funded by the European Union (grant SI2/585616), by several other ICCAT CPCs, the ICCAT Secretariat and by other entities (see http://www.iccat.int/GBYP/en/Budget.htm). The contents of this paper do not necessarily reflect the point of view of ICCAT or of the other funders, which have not any responsibility about them, neither do them necessarily reflect the views of the funders and in no ways anticipate the Commission's future policy in this area.

Table 1. Coordination staff (*) and contracted or invited scientists (**) who participated officially in GBYP meetings in 2011.

Date	*Place*	*Meeting*	*Motivation and participation*
7-11/01/2011	Madrid, Spain	Workshop on the use of R tools in the data preparatory work for ICCAT-SCRS	Coordination of the data preparatory work, including bluefin tuna data (J. Ortiz de Urbina**, P. Pallarés, L. Kell, M. Ortiz, C. Palma).
27-31/01/2011	La Spezia, Italy	Historical Oceanography Society	Board meeting – organisation of the first international congress and use of ancient bluefin tuna data in correlation with historical oceanographic and climate parameters to better understand the distribution of bluefin tuna in some marginal areas of its range. (A. Di Natale*).
14-16/02/2011	Madrid, Spain	ICCAT-GBYP Workshop on Aerial survey analysis	Review of the current knowledge on aerial survey techniques and approaches, the data obtained by the GBYP in Phase 1, operational problems encountered and proposals for a more focused approach in the next phases. (A. Di Natale*, G. Donovan**, M. Lutcavage**, J.M. Fromentin**, P. Pallarés, L. Kell, M. Ortiz, C. Palma).
17/02/2011	Madrid, Spain	ICCAT-GBYP Operational Meeting on Biological and Genetic Sampling and Analysis	Review of the best approaches in terms of coverage and techniques, TORs for Call for Tenders for the sampling design (A. Di Natale*, M. Lutcavage**, J.M. Fromentin**, O. Sakay**, P. Pallarés, L. Kell, M. Ortiz, C. Palma).
18/02/2011	Madrid, Spain	ICCAT-GBYP Operational Meeting on Bluefin Tagging	Discussion about the GBYP Tagging design and the GBYP Tagging manual, possible operational approaches (A. Di Natale*, J. L. Cort**, E. Belda**, M. Lutcavage**, J.M. Fromentin**, P. Pallarés, L. Kell, M. Ortiz, C. Palma).
23-24/02/2011	Cartagena, Spain	Un nuevo amanecer para el atún rojo (organised by the Regional Government of Murcia, the IEO and the State Secretary for the Sea)	Presentation of GBYP and discussion about the possibility to develop joint or parallel research activities in Spain to enlarge the GBYP possibilities. (A. Di Natale).
28/04/2011	Madrid, Spain	Cuaderno de bitácora del atún rojo: sostenibilidad, trazabilidad, gastronomia (organised by Balfegó Group)	Contacts with the stakeholders and the Spanish Administrations. (D. Meski, A. Di Natale*, M. Idrissi*).
17-18/05/2011	Madrid, Spain	ICCAT-GBYP Training Course for Aerial Survey on Bluefin Tuna Spawning Aggregations	Training for pilots, professional spotters and scientific observers working for the GBYP aerial survey. (A. Di Natale*, M. Idrissi*, G. Donovan**, A. Cañadas**).

20-26/05/2011	Tangier, Morocco	ICCAT-GBYP Symposium on Trap Fishery for Bluefin Tuna	Review of the knowledge on tuna trap fishery and data A. Di Natale*, M. Idrissi*, P. Pallarés, M. Ortiz).
27/5-1/7/2011	Madrid, Spain	Joint Meeting of the ICCAT Working Group on Stock Assessment Methods and the Bluefin Tuna Species Group to Analyse Assessment Methods developed under the GBYP.	Review of various approaches and methods and presentation of the preliminary advancements of the GBYP modelling approaches (A. Di Natale*, M. Idrissi*, J. Cooke**, P. Levontin**, A. Leach**, P. Pallarés, L. Kell, M. Ortiz).
04/07/2011	Rome, Italy	Italian Society of Marine Biology national meeting on biological sampling (including bluefin tuna)	Presentation of GBYP Phase 2 programmes and discussion about the cooperation of various Institutes within the ICCAT-GBYP Biological and Genetic sampling activities (A. Di Natale*).[1]
10-18/09/2011	Mahe, Seychelles	MADE meeting (Seychelles Fishing Authority)	Discussion on various electronic tagging possibilities and rendering problems; presentation of GBYP Phase 2 tagging programme and discussion about the cooperation of various Institutes within the ICCAT-GBYP (A. Di Natale*).[2]
20-21/09/2011	La Valletta, Malta	REC-MED meeting on bluefin tuna fishery	Presentation of GBYP activities and the tag awareness and rewards programme (A. Di Natale).[3]

[1]Participation on personal basis, not officially on behalf of GBYP, and without cost to the GBYP.
[2]Participation on personal basis, without any cost to the GBYP.
[3]Invited by RAC-MED, without cost to the GBYP.

Table 2. Summary status of the various items included in the Phase 2 activity of the GBYP.

Item	*Date of Call for Tenders*	*Award date or contract date*	*Deliverables*		
			Preliminary report	*Draft final report*	*Final report*
Data Recovery Plan - Trap Fishery (ICCAT-GBYP 01/2011) (3 contracts)	26/01/2011	02/03/2011 & 28/03/2011	15/04/2011	28/04/2011	07/05/2011
Data Recovery Plan - all BFT fisheries (ICCAT-GBYP 02/2011) (4 contracts)	26/01/2011	18/03/2011 & 28/03/2011	02/09/2011	23/09/2011	03/10/2011
Biological Sampling Design (ICCAT-GBYP 03/2011) (1 contract)	11/03/2011	29/03/2011	-	-	31/03/2011
Stock Assessment Modelling (ICCAT-GBYP 04/2011) (2 contracts)	15/03/2011	06/04/2011	20/06/2011	-	26/09/2011
Aerial Survey on Spawning Aggregations (ICCAT-GBYP 05/2011) (3 contracts)	05/04/2011	05/05/2011	24/06/2011	31/07/2011	23/09/2011
Biological and Genetic Sampling and Analysis (ICCAT-GBYP 06/2011) (1 contract)	27/04/2011	27/05/2011	24/06/2011	21/11/2011	30/11/2011
Tagging Programme (ICCAT-GBYP 07/2011) (replaced by the following one)	12/05/2011	-	30/08/2011	21/11/2011	30/11/2011
Tagging Programme (ICCAT-GBYP 08/2011) (1 contract)	16/06/2011	11/07/20110	30/08/2011	21/11/2011	30/11/2011
Tag Awareness and Awards Campaign (ICCAT-GBYP 09/2011) (1 contract)	28/07/2011	01/09/2011	17/09/2011	26/09/2011	30/11/2011
Data Recovery - Supply of SST data and maps. (1 contract)		22/07/2010	03/08/2011	-	05/09/2011
Data Recovery - Aerial Survey Data Elaboration (1 contract)		31/07/2011	23/09/2011	-	15/12/2011

Table 3. Results obtained by the first GBYP Call for Tenders for data recovery (limited to tuna trap data) in Phase 2.

GBYP 01/2011: tuna trap data recovery

Progetto Blu Soc. Coop. a r.l. - Italy		*Italy*	*Spain*	*Portugal*	*Tunisia*	*Lybia*	*Total*
Offered data sets (Proposal)		67	14	20	7	21	129
Presented data sets		73	18	22	8	18	**139**
Balance (+ or -)		6	4	2	1	- 3	10
Period of time covered		1708 à 1935	1902 à 1934	1837 à 1934	1863 à 1932	1915 à 1941	1708 - 1941
Nb records (# indiv. and/or weight!!/trap/year)Sheet: "CatchesByYear"		1.460	220	546	211	143	**2.580**
Total number of individuals, in Column "BFT(n)"		2.256.865	1.224.907	2.059.562	791.661	195.028	**6.528.023**
Catches/CatchesByYear (% in numbers)		***52%***	***45%***	***1%***	***31%***	***74%***	***33%***
Period of time covered		1878 - 1935	1910 à 1931	1920 - 1933	1881 à 1932	1919 à 1942	1878 - 1945
Nb records (/trap/matanza/day/year)Sheet: "Catches"		8.301	2.974	245	963	1.060	**13.543**
Total number of individuals, in Column "BFT(n)"		1.171.666	549.615	24.058	244.279	144.481	**2.134.099**

IEO Santander - Spain			*Spain*
Offered data sets (Proposal)			undefined
Presented data sets			**58**
Balance (+ or -)			
Period of time covered			1525 to 2009
No. records (# indiv. and/or weight!!/trap/year)Sheet: "CatchesByYear"			**1.640**
Total number of individuals, in Column "BFT(n)"			**11.752.779**
detailed data on Catches/CatchesByYear (% in numbers)			***6%***
Period of time covered			1906 à 2009
Nb records (/trap/matanza/day/year)Sheet: "Catches"			**5.323**
Total number of individuals, in Column "BFT(n)"			**761.307**

INRH - Morocco	*Morocco*
Offered data sets (Proposal)	undefined
Presented data sets	**13**
Balance (+ or -)	
Period of time covered	1927 to 1995
No. records (# indiv. and/or weight!!/trap/year)Sheet: "CatchesByYear"	**151**
Total number of individuals, in Column "BFT(n)"	**331.487**
detailed data on Catches/CatchesByYear (% in numbers)	***21%***
Period of time covered	1996 to 2007
No. records (/trap/matanza/day/year)Sheet: "Catches"	**926**
Total number of individuals, in Column "BFT(n)"	**68.051**

all trap data	*Morocco*	*Italy*	*Spain*	*Portugal*	*Tunisia*	*Lybia*	*Total*
Offered data sets (Proposal)							
Presented data sets	**13**	**73**	**76**	**22**	**8**	**18**	**210**
Balance (+ or -)							
Period of time covered	1927 - 1995	1708 - 1935	1525 - 2009	1837 - 1934	1863 - 1932	1915 - 1941	1525 -2009
No. records (# indiv. and/or weight!!/trap/year)Sheet: "CatchesByYear"	**151**	**1460**	**1.860**	**546**	**211**	**143**	**4.371**
Total number of individuals, in Column "BFT(n)"	**331.487**	**2.256.865**	**12.977.686**	**2.059.562**	**791.661**	**195.028**	**18.612.289**
detailed data on Catches/CatchesByYear (% in numbers)	***21%***	***52%***	***10%***	***1%***	***31%***	***74%***	***16%***
Period of time covered	1996 - 2007	1878 - 1935	1906 - 2009	1920 - 1933	1881 - 1932	1919 - 1942	1878 - 2009
No. records (/trap/matanza/day/year)Sheet: "Catches"	**926**	**8.301**	**8.297**	**245**	**963**	**1.060**	**19.792**
Total number of individuals, in Column "BFT(n)"	**68.051**	**1.171.666**	**1.310.922**	**24.058**	**244.279**	**144.481**	**2.963.457**

Table 4. Results obtained by the second GBYP Call for Tenders for data recovery in Phase 2.

Country	*Gear*	*Initial year:*	*To year:*	*Number of tunas*	*Number of records*
Morocco	HL	1999	2009	1992	1986
Portugal	TRAP	1852	1972	6848354	11095
Spain	BB + TR	1953	1976	31086	6476
Total		1852	2009	6881432	9571

Table 5. Comparison of main results on effort, encounter rates and density of schools, and mean and total weight in the three subareas, between 2010 and 2011 (provisional data).

Year	*2010*			*2011*		
Sub-area	*1*	*2*	*3 (left truncation)*	*1*	*2*	*3M (left truncation)*
Survey area (km^2)	62,264	52,461	90,796	62,264	52,461	100,471
Number of transects	52	45	42	131	77	65
Transect length (km)	6,301	8,703	5,288	7,977	8,771	11,429
Effective strip width x2 (km)	9.66	2.92	9.66	7.03	7.03	0.66
Number of schools	7	6	19	11	10	35
Encounter rate of schools	0.0011	0.0007	0.0036	0.0014	0.0011	0.0031
%CV encounter rate	51	43	39	32	31	24
Density of schools (1000 km^{-2})	0.157	0.237	0.508	0.196	0.162	3.980
%CV density of schools	55	53	44	37	36	26
Mean weight (t)	127.1	124.2	50.6	84.8	42.7	102.8
%CV weight	8.0	5.6	25	26	44	27
Total weight (t)	**1,244**	**1,540**	**2,335**	**1,033**	**364**	**44,837**
%CV total weight	56	53	51	43	54	41

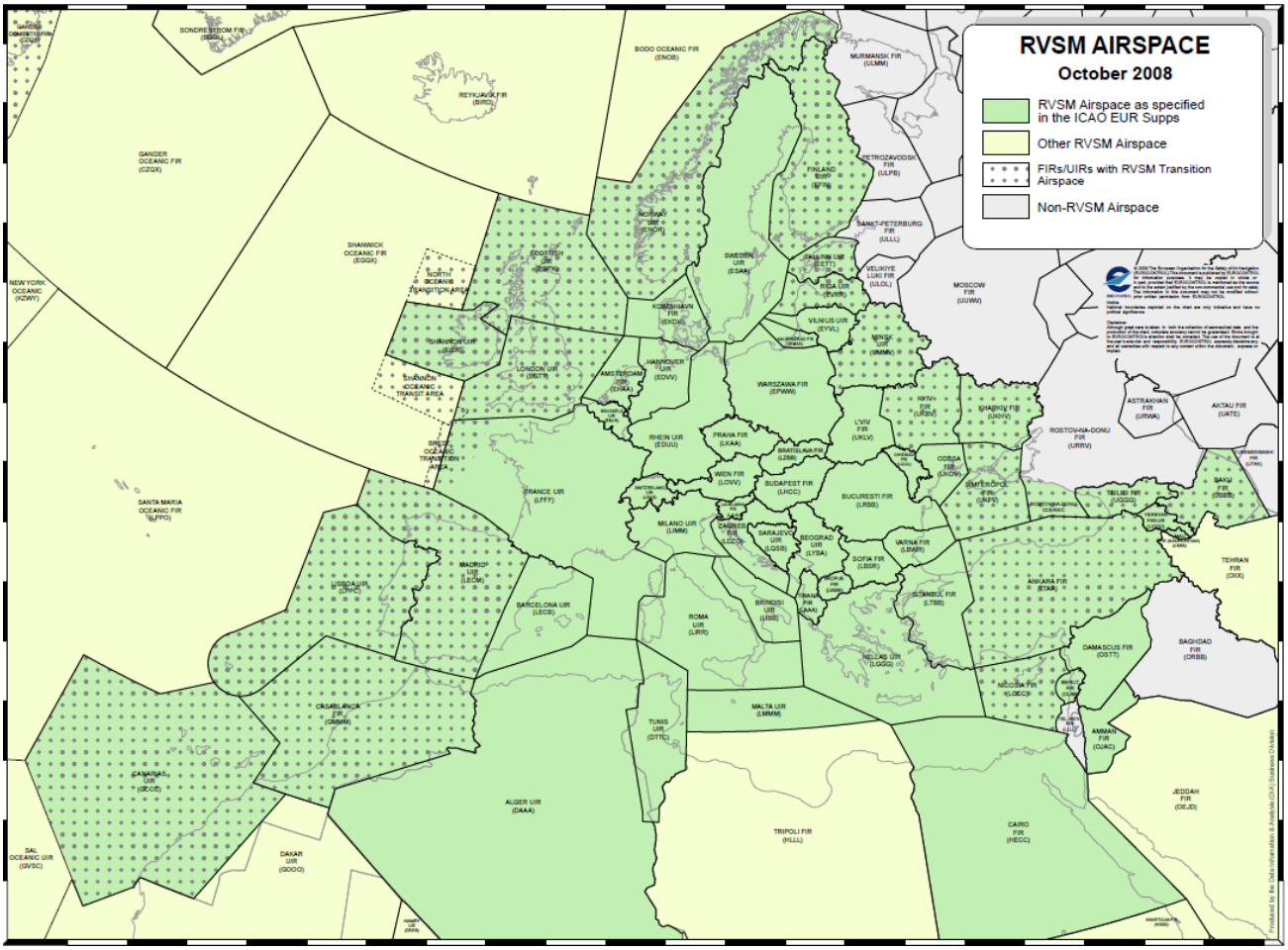

Figure 1. Boundaries of the national air-spaces in the Mediterranean, showing the complexity of operating in a geographical area with 23 Countries (16 are ICCAT CPCs), with various rules.

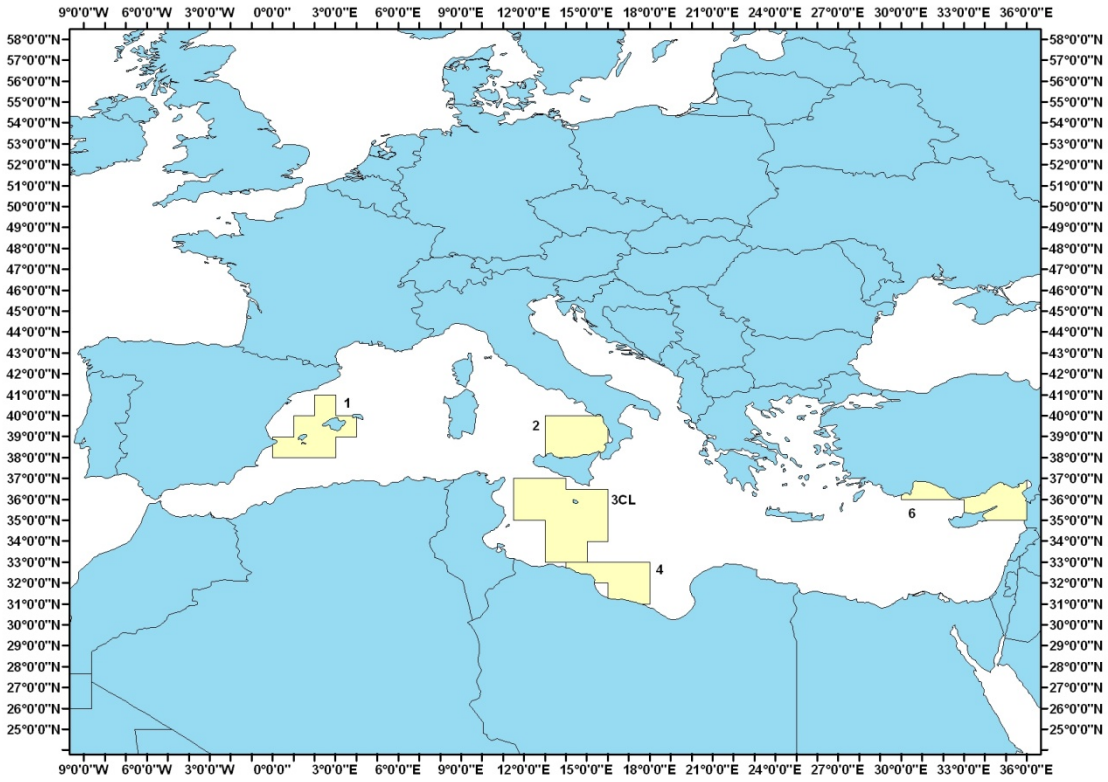

Figure 2. The first scenario for the aerial survey on bluefin tuna spawning aggregation in Phase 2 (2011), with 5 sub-areas.

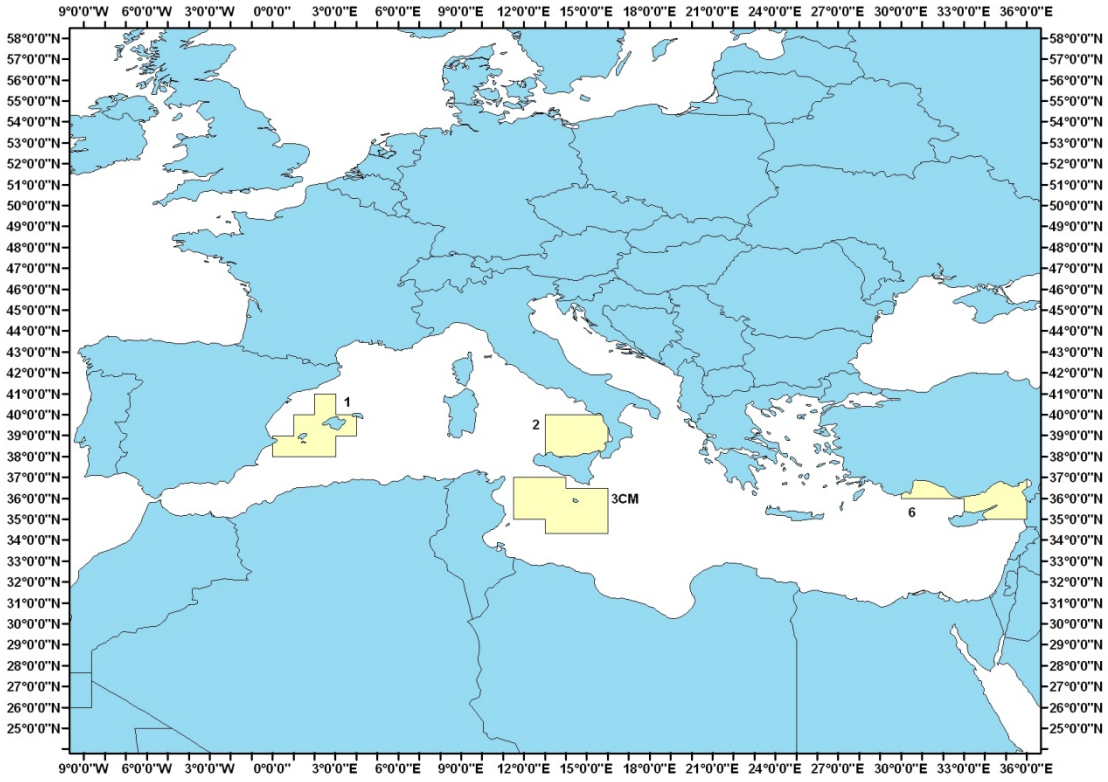

Figure 3. The second scenario for the aerial survey on bluefin tuna spawning aggregation in Phase 2 (2011), with 4 sub-areas. This scenario was the one adopted for the survey in 2011.

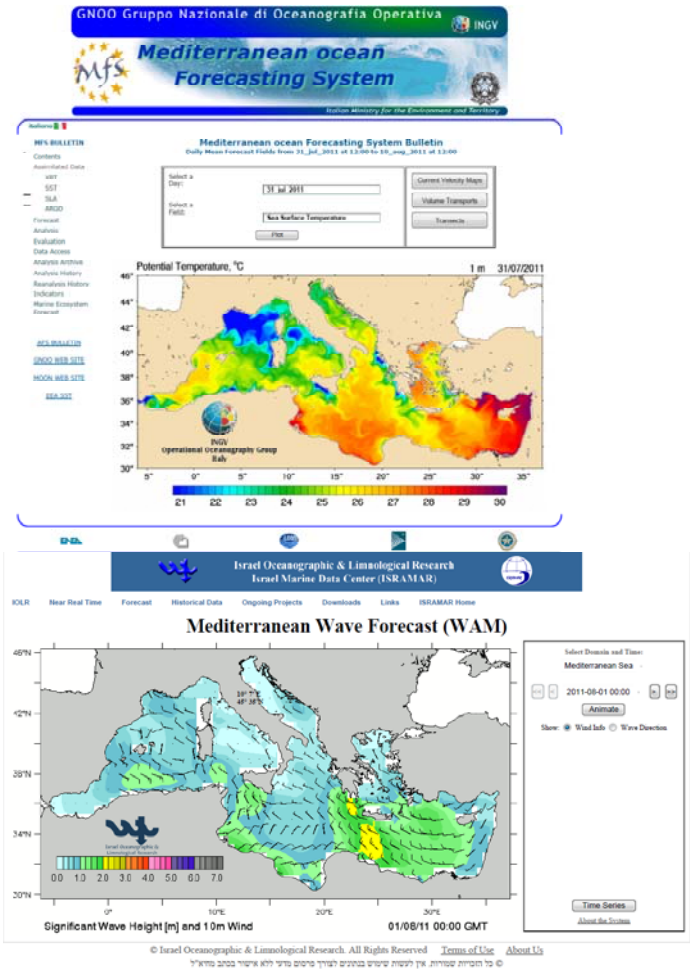

Figure 4. An example of the daily maps for surface temperatures a (left) and waves (right) collected by GBYP during the aerial survey campaign in 2011.

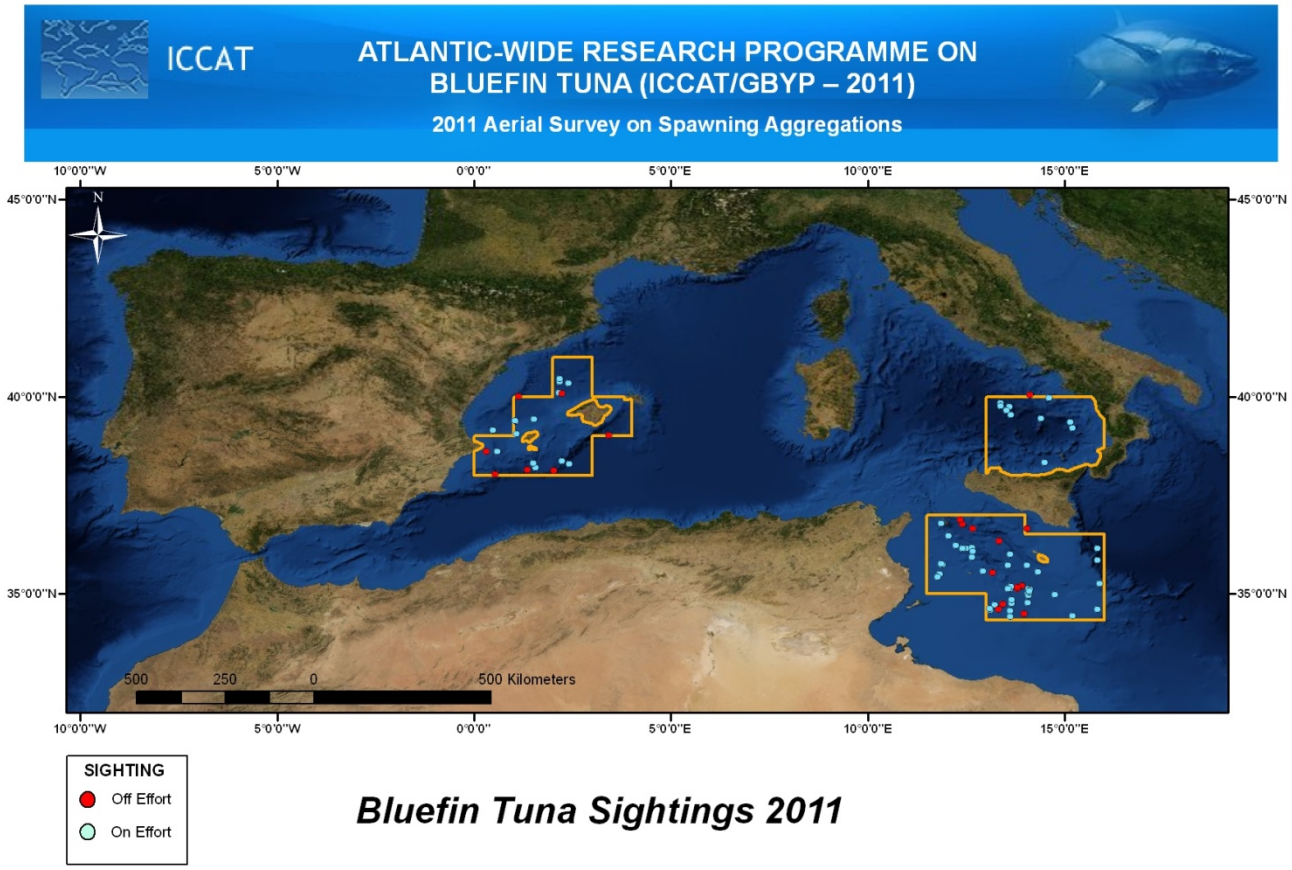

Figure 5. Location of bluefin tuna sightings during the aerial survey in 2011.

Figure 6. Logo and a preliminary example of the poster to be used for the tagging awareness campaign.

Figure 7. A very preliminary draft of the design which will be used on the T-shirts for the ICCAT-GBYP tag recovery campaign (© Les Gallagher).

ICCAT-GBYP Phase 2

List of Deliverables (22 December 2010 - 31 July 2011)
Produced Within the EC Grant Agreement

1. GBYP Phase 1. Annual Report 2009-2010 – March 10, 2011: 1-22 and Annex 1-691.
2. B1.1 – Report on the ICCAT-GBYP expected improvements in Phase 2 - January 31, 2011: 1- 15.
3. B1.2 – Report on the ICCAT-GBYP Symposium on Trap Fishery for Bluefin Tuna – June 27, 2011: 1-14 and Annex 1-351.
4. B1.3 – Report on the ICCAT-GBYP Data Recovery Activity in 2011 – June 27, 2011: 1-4 and Annex 1-103.
5. B1.3.2 – Updating Report on the ICCAT-GBYP Data Recovery Activity in 2011 – October 11, 2011: 1-4 and Annex: 1-103.
6. C1 – Report on the ICCAT-GBYP Workshop on Aerial Surveys for Bluefin Tuna – March 21, 2011: 1-23 and Annex: 1-294.
7. C2 – Report on the ICCAT-GBYP Training Course for Aerial Survey for Bluefin Tuna Spawning Aggregations – June 27, 2011: 1-5 and Annex 1-74.
8. C3 – Report on the Revision of the GBYP Aerial Survey Design for Bluefin Tuna Spawning Aggregations in 2011 – April 28, 2011: 1-12 and Annex 1-72.
9. C4 – Report on the GBYP Aerial Survey for Bluefin Tuna Spawning Aggregations in 2011 – October 11, 2011: 1-12 and Annex: 1-162.
10. D1.1 – ICCAT-GBYP Operational Meeting on Tagging – March 21, 2011: 1-17 and Annex: 1-54.
11. D1.2 – Report on the ICCAT-GBYP Tagging Activity – July 31, 2011: 1-10 and Annex: 1-66.
12. D2.2 – Updating Report on the ICCAT-GBYP Tagging and Tag Awareness Activity – October 11, 2011: 1-5 and Annex: 1-60.
13. E1.1 – ICCAT-GBYP Operational Meeting on Biological Sampling for Bluefin Tuna – March 21, 2011: 1-15 and Annex: 1-106.
14. E2 – Report on the GBYP Biological and Genetic Sampling and Analyses in 2011 – October 11, 2011: 1-18 and Annex: 1-35.
15. F1.1 – Report on the ICCAT-GBYP Modelling Approaches. July 12, 2011: 1-5 and Annex 1-47.
16. F1.2 – Updating Report on the ICCAT-GBYP Modelling Approaches. October 21, 2011: 1-4 and Annex: 1-84.
17. All Tasks. 1 – GBYP mid-term Scientific and Technical report for Phase 2- 2011 Activities. July 31, 2011: 1-23 and Annex 1-26.

LIST OF SCIENTIFIC PAPERS

SCRS/2011/036 The iconography of tuna traps: an essential information for the understanding of the technological evolution of this ancient fishery. Di Natale, A. ICCAT-GBYP Symposium on Trap Fishery for Bluefin Tuna (Tangier, May 23-25, 2011).

SCRS/2011/037 The literature on eastern Atlantic and Mediterranean tuna trap fishery. Di Natale A. ICCAT-GBYP Symposium on Trap Fishery for Bluefin Tuna (Tangier, May 23-25, 2011).

SCRS/2011/038 Factors to be taken into account for a correct reading of tuna traps catch series. Di Natale, A. and Idrissi, M. ICCAT-GBYP Symposium on Trap Fishery for Bluefin Tuna (Tangier, May 23-25, 2011).

SCRS/2011/039 Tuna trap data in the ICCAT data base and GBYP contributions. Ortiz, M., Palma, C., Pallarés, P., Kell, L., Idrissi, M. and Di, Natale A., ICCAT-GBYP Symposium on Trap Fishery for Bluefin Tuna (Tangier, May 23-25, 2011).

SCRS/2011/110 An evaluation of the implications of population structure on the current bluefin tuna advice framework. Kell L., Fromentin, J-M., Bonhommeau, S.

SCRS/2011/152 New data about the historical distribution of bluefin tuna (*Thunnus thynnus* L., in the Arctic Ocean. Di Natale, A.

Bluefin tuna and oceanography: How a careful analysis of the ancient bibliography can contribute to enlarge our knowledge on the distribution of this species. 1st Conference of the Historical Oceanography Society, Porto Venere. Di Natale, A.

Annex 2

ICCAT ATLANTIC WIDE RESEARCH PROGRAMME FOR BLUEFIN TUNA (GBYP)
PUBLICATION POLICY, EDITORIAL AND DATA USE RULES
(2011 edition)

The ICCAT Atlantic Wide Research Programme for Bluefin Tuna (GBYP) is an international research, co-funded by the European Union (80%), several ICCAT CPCs, the ICCAT Secretariat and by other entities (http://www.iccat.int/GBYP/en/Budget.htm).

The publication policy concerning the results obtained by the various researches carried out within this programme must follow the rules included in the contract between the ICCAT and the funders and those rules will be mandatory for all the participants to the GBYP. The acceptance of a contract provided by the GBYP will automatically imply the acceptance of the "Publication policy and Editorial rules" here detailed.

1. Ownership of the results of the Programme (GBYP), including industrial and intellectual property rights, and of the reports and other documents relating to it shall be vested by the ICCAT.

2. The result of each action carried out within the Programme (GBYP) and all the scientific results obtained by these actions shall be presented to the ICCAT-SCRS at the first opportunity.

3. The scientific results of actions carried out within the Programme (GBYP), after the presentation to the ICCAT/SCRS, can be published, entirely or partly, on the ICCAT Collective Volume of Scientific Papers, the Aquatic Living Resources journal with which ICCAT has a special publication agreement or in other scientific journals. The Authors who wish to publish these results in other scientific journals shall previously require a permit to ICCAT. ICCAT, following the spirit of this scientific programme, encourages the Authors engaged in research action within the Programme (GBYP) to disseminate their results, particularly in international scientific journals.

4. Each report or article concerning the results obtained within the actions of the Programme (GBYP) must include the following sentence:

   "This work was carried out under the provision of the ICCAT Atlantic Wide Research Programme for Bluefin Tuna (GBYP), co-funded by the European Union (grant SI2/585616), by several other ICCAT CPCs, the ICCAT Secretariat and by other entities (see http://www.iccat.int/GBYP/en/Budget.htm). The contents of this paper do not necessarily reflect the point of view of ICCAT or of the other funders, which have not responsibility about them, neither do them necessarily reflect the views of the funders and in no ways anticipate the Commission's future policy in this area."

5) Any publication based on data collected by the GBYP must include the following sentence:

   "Data (or eventually: "A part of the data") used in this paper were obtained under the All the data collected under the provision of the ICCAT Atlantic Wide Research Programme for Bluefin Tuna (GBYP), co-funded by the European Union (grant SI2/585616), by several other ICCAT CPCs, the ICCAT Secretariat and by other entities (see http://www.iccat.int/GBYP/en/Budget.htm). The contents of this paper do not necessarily reflect the point of view of ICCAT or of the other funders, which have not responsibility about them, neither do them necessarily reflect the views of the funders and in no ways anticipate the Commission's future policy in this area."

6) All the data collected under the Programme (GBYP) shall be used only for scientific purposes and according to the ICCAT rules (see also SCRS/09/122). Any other use of these data should be specifically authorised by ICCAT.