

**ICCAT GBYP ATLANTIC-WIDE BLUEFIN TUNA RESEARCH  
PROGRAMME 2010  
GBYP COORDINATOR'S DETAILED ACTIVITY REPORT FOR 2009-2010**

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SUMMARY

*The Atlantic-wide research programme on bluefin tuna, conventionally GBYP, proposed by the SCRS and adopted by the Commission in 2008, officially begun on October 2009. The Coordinator was officially hired on March 2010 and the activity practically started on the same month. During this first period of activity, the Programme was set-up at the ICCAT Secretariat and several initiatives have been taken, following the guidelines included in the Programme. In particular, in this first phase the coordination become effective together with the GBYP Steering Committee, the aerial surveys have been properly designed, the first aerial survey on spawning aggregation was completed and the data have been elaborated. The data mining and data recovery exercise was started, and many data sets have been added to the ICCAT data base. It was also possible to organize the tagging design for the Eastern stock and to plan in detail the research initiatives for the next two phases. The GBYP publication policy, editorial and data rules have been defined and adopted at the early beginning of the activities. This first phase demonstrated the high relevance of the GBYP for providing fishery independent data and improving the current bluefin tuna assessment.*

RÉSUMÉ

*Le Programme de recherche sur le thon rouge englobant tout l'Atlantique, dénommé conventionnellement « GBYP », proposé par le SCRS et adopté par la Commission en 2008, a officiellement commencé en octobre 2009. Le coordinateur a été recruté au mois de mars 2010 et les activités pratiques ont démarré le même mois. Au cours de sa première période d'activité, le Programme a été établi au Secrétariat de l'ICCAT et plusieurs initiatives ont été prises, suivant les directives établies dans le Programme. La première phase a notamment porté sur la coordination effective avec le Comité de direction du GBYP, la conception adéquate des prospections aériennes, la première prospection aérienne de concentration de reproducteurs ayant été achevée et les données élaborées. L'exercice d'exploration des données et de récupération des données a démarré et de nombreux jeux de données ont été ajoutés à la base de données de l'ICCAT. Il a également été possible d'organiser la conception du marquage pour le stock de l'Est et de planifier dans le détail les initiatives de recherche pour les deux prochaines phases. La politique de publication ainsi que les règles éditoriales et en matière de données du GBYP ont été définies et adoptées au tout début des activités. La première phase a démontré que le GBYP était un programme très important pour fournir des données indépendantes des pêcheries et améliorer l'évaluation actuelle du thon rouge.*

RESUMEN

*El Programa de investigación sobre atún rojo para todo el Atlántico, denominado convencionalmente GBYP, propuesto por el SCRS y adoptado por la Comisión en 2008, y se inició oficialmente en octubre de 2009. El Coordinador fue contratado en marzo de 2010 y las actividades prácticas empezaron ese mismo mes. Durante este primer periodo de actividad, el Programa se estableció en la Secretaría de ICCAT y se han emprendido varias iniciativas siguiendo las directrices del Programa. En particular, en esta primera fase se ha hecho efectiva la coordinación a través del Comité directivo del GBYP, se han diseñado adecuadamente las prospecciones aéreas, se ha finalizado la primera prospección aérea sobre concentraciones de reproductores y se han elaborado los datos. Se han empezado los ejercicios de minería y recuperación de datos, y se han incorporado muchos conjuntos de datos a la base de datos de ICCAT. También fue posible organizar el diseño de marcado para el stock oriental y planificar detalladamente las iniciativas de investigación para las dos próximas fases. Al iniciar las*

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*actividades, se ha definido y adoptado la política de publicación y la normas editoriales y en cuanto a datos del GBYP. La primera fase ha demostrado la gran importancia del GBYP a la hora de proporcionar datos independientes de la pesquería y de mejorar la evaluación actual del atún rojo.*

#### 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 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* through 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 Euro 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 to form a Steering Committee comprised by the SCRS Chair, the ICCAT

Executive Secretary or his/her Assistant, 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.

## 2. Coordination activities

The GBYP officially started on 12 October 2009, with the signature of the agreement between the European Community and the ICCAT Secretariat. The GBYP coordination full-time activity officially started on March 3, 2010, after hiring the Coordinator.

The very first period was devoted to set-up a detailed weekly workplan for 2010, to organise the coordination structure at the Secretariat, to set-up the Steering Committee and nominate its members (13/03/2010); the Steering Committee is now composed by the Chair of SCRS, Dr. Gerald Scott, the BFT-W Rapporteur, Dr. Clay Porch, the BFT-E Rapporteur, Dr. Jean-Marc Fromentin, the ICCAT Executive Secretary, Mr. Driss Meski, and an external expert, Dr. Tom Polacheck, who kindly accepted this duty. The ICCAT Secretariat set up the administrative structure and the administrative rules were agreed and established, accordingly with the ICCAT system and taking into account also the programme administrative needs.

The Coordinator participated officially to the following meetings:

<i>Date</i>	<i>Place</i>	<i>Meeting</i>	<i>Motivation</i>
12-14/04/2010	Malta	FEAP (Med tuna Industry)	Presentation of GBYP and request for cooperation
15/04/2010	Rome (IT)	Direction General for Fishery	Presentation of GBYP and discussion about the possibility to develop a national aerial survey programme on spawners and juveniles to enlarge the GBYP possibilities
19/04/2010	Madrid (SP)	Balfego Group	Presentation of GBYP and request for cooperation
21-23/04/2010	Madrid (SP)	ICCAT Working Group on Stock Assessment Methods	participation
31/5-4/6/2010	Madrid (SP)	ICCAT Intersessional Meeting of the Sub-Committee on Ecosystems	participation
30-31/05/2010	Barcelona (SP)	Tuna RFMOs	Informal meetings with scientists and CPCs to further support the GBYP initiatives
2-5/06/2010	Carloforte (IT)	Workshop on Tuna	Presentation of GBYP, workshop on tuna issues, contacts with the trap industries for cooperation
14-16/06/2010	Bonn (GE)	OSPAR Biodiversity Comm.	Presentation of GBYP and discussion on tuna problems
17-18/06/2010	Madrid (SP)	Bluefin Tuna Data Preparatory Meeting	Presentation of GBYP and participation to the meeting
19/06/2010	Madrid (SP)	Steering Committee Meeting	Discussion about strategies and agenda
24-25/06/2010	Bruxelles (BE)	EC-DG MARE	Discussions about the administrative duties of GBYP and future biannual funding
14/07/2010	Madrid (SP)	IEO national meeting on tuna research programmes	Presentation of GBYP and discussion about possible cooperation

4-5/09/2010	Madrid (SP)	GBYP Steering Committee	Review of the first year activities; planning for the next two years; budget
6-12/09/2010	Madrid (SP)	Bluefin tuna assessment meeting	Presentation of GBYP and participation to the meeting
4-7/10/2010	Madrid (SP)	SCRS Plenary	Reporting the GBYP activities in Phase 1 for revision, discussion and approval.
23/10/2010	Santa Margherita Ligure (IT)	Status of large pelagic in the Mediterranean Sea (bluefin and swordfish) and correlation with environmental factor.	Review of the bluefin tuna status (SCRS), presentation of GBYP and participation to the meeting
27/10/2010	Ametlla de Mar (SP)	The bluefin tuna in the Mediterranean: research for sustainability	Review of the bluefin tuna status (SCRS), presentation of GBYP and participation to the meeting
28/10/2010	Rome (IT)	Italian society of Marine Biology national meeting on tuna research programmes	Presentation of GBYP and discussion about possible cooperation
14-28/10/2010	Paris (FR)	17 <sup>th</sup> Special Meeting of the Commission	Support to SCRS Chair for the presentation of GBYP activity in Phase 1 and planned activity in Phase 2; informal meetings with tuna scientists.
10/12/2010	Siena (IT)	Workshop on “Monitoring of Biodiversity”	Presentation of GBYP, including techniques and methodologies

Furthermore, the GBYP coordinator is providing a scientific support to all the national initiatives which are potentially able to increase the effectiveness of the GBYP and its objectives. For this reason, he was also asked to join the Steering Committee for the bluefin tuna programmes of the NOAA, together with other members of the GBYP Steering Committee.

In conformity with the Atlantic-Wide Bluefin Research Programme (GBYP) adopted by the SCRS and the Commission, the following research initiatives have been initiated (see also **Table 1** at the end of the activities):

### 3. 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 every case, surveys shall be conducted with a statistically sound design and for several years in order to get reliable indices.

The GBYP set up general rules for standardising the aerial surveys to be conducted: all aircraft shall have upper wings, possibly two engines, should stay at an altitude between 300 to 330 m over the sea level, and 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. Each team on board shall include an expert pilot, a professional tuna spotter and a scientific observer. All sightings shall be properly recorded on a common form in excel, to facilitate the data elaboration, and documented by photos.

The budget available (300,000 Euro) for the first phase was not enough to cover all areas and all needs (spawning aggregations and juvenile aggregations). After a discussion with the Steering Committee, it was decided to concentrate all efforts and resources only on bluefin tuna spawning aggregations, with the purpose to get a first minimal estimation of the spawning stock biomass and to develop an index. It was also agreed to postpone any eventual intercalibration exercise to the next years, because of time, budget organisation and administrative constraints. It was also agreed to support eventual additional activities of aerial surveys on juveniles and aerial surveys in other spawning areas, conducted with national funds, providing them common methodologies.

### **3.1 Aerial survey design**

The preliminary work was devoted to identify the most relevant areas and it was carried out at the ICCAT Secretariat, by using the 2008 and 2009 VMS data from purse-seine vessels. It was agreed to concentrate the efforts only on areas where the PS fishing activity was more intense in these last two years, even if it was clear that the spawning areas were possibly much larger than those identified. It was established to define them by squares of  $1^{\circ} \times 1^{\circ}$ .

The study revealed 6 sub-areas where the purse-seine fishing activity was more intense during the spawning period in 2008 and 2009 (**Figure 1**), but it was necessary to exclude fishing activities not targeting spawners (e.g.: those in central-north Adriatic Sea).

Even if there was no mention on the budget or in the Programme, it was decided that a survey design, statistically sound, was absolutely necessary before beginning the survey activity and this item was considered as an essential preliminary part of the “Aerial Survey”. The sampling design was required in a way that it should balance the available funds with the flight hours required.

The Call for Tenders was released on March 23, 2010 (ICCAT Circular 812/2010), receiving only one bid. The contract was awarded to Prof. Philip Hammond (UK) on April 5, 2010. Prof. Hammond provided a first version of the Aerial Survey Design on April 22, 2010, well in advance of the date established by the contract (May 15). This allowed some Members of the Steering Committee, during a meeting held at the ICCAT Secretariat on April 23, 2010, to directly discuss with Prof. Hammond and to require some modifications (e.g.: more distance between transects), with the purpose to have more replicates in each area.

The new adapted version of the sampling design, with all the necessary tables and figures, was provided on May 1, 2010 (**Figure 2**).

### **3.2 Aerial survey on spawning aggregations**

In parallel with the sampling design activities, due to the lack of sufficient time, a Call for Tenders for the Aerial Survey on Spawning Aggregations was released on April 6, 2010 (ICCAT Circular n. 1000/2010). The Secretariat received 7 bids and 3 of these were awarded on April 29, 2010: Grup Air Med (SP) for sub-areas 1 and 3, Consorzio Unimar (IT) for sub-area 2 and P rigord Travail A rien (FR) for sub-areas 4, 5 and 6. The contracts were discussed in three meetings at the Secretariat from 11 to 13 May 2010 and all were signed within a few days. The date for beginning the surveys was set on May 24, 2010, for all tenders. It was agreed that preliminary data should be delivered just before the 2010 BFT Assessment meeting. A common format to transmit the aerial survey data to the ICCAT Secretariat was provided to all the contractors, with the purpose to get the data “ready to use”.

All tenders were able to get the flight permits from Spain, Italy, Malta, Cyprus and Turkey in due time. Both Grup Air Med and P rigord Travail A rien had serious troubles for obtaining the flight permits from Egypt, Libya and Tunisia. Finally, with a lot of delay, P rigord Travail A rien got the flight permit from Egypt. It was impossible to obtain the flight permits from Libya and Tunisia, despite of several interventions officially made by the ICCAT Executive Secretary and various diplomatic efforts. Another problem raised when one of the aircrafts belonging to P rigord Travail A rien approached the airspace of Egypt, because the Egyptian Authorities changed the authorisation for the requested altitude (300 m), imposing a different one (1500 m), not suitable for the survey, and requested the aircraft to land in Alexandria to apply for a new permit, to be eventually released in the future. All these problems together imposed a revision of the contracts with Grup Air Med and P rigord Travail A rien and, at the same time, a revision of the aerial sampling design.

Sub-area 4 (all inside the Libyan airspace) and sub-area 5 (all inside the Egyptian aerial space) were cancelled, creating a serious problem for the survey in general, because the biological information on bluefin tuna spawning and behaviour in these areas were almost nil, and then precious to be collected for a better understanding of the bluefin tuna in the Mediterranean. Sub-area 3 has been reduced in size (cutting off 18 miles in the southern part, because they were within the Libyan airspace, and cutting another section, till the eastern limit of the Tunisian airspace, on the western side).

In agreement with the Steering Committee, it was decided to define two additional sub-areas, where the fishing activity on spawners was anyway present in 2008 and 2009, even if it was apparently less intense. The two new sub-areas, 7 and 8 (**Figure 3**), were given to P rigord Travail A rien, in substitution of sub-areas 4 and 5. It was

necessary to provide in emergency a new aerial survey design, following the same design made on near or similar sub-areas. Even in this case, it was necessary to adjust the design for sub-area 8, cutting off 18 miles from the southern limit, due to the Libyan airspace boundary. The amendment to the contract was provided to Périgord Travail Aérien on June 24, 2010.

The same aerial survey design approach was applied by Italy, with national funds, in two additional zones close attached to sub-area 2 (**Figure 4**). The survey was carried out testing the possibility to use a different type of aircraft (ATR 42 MP), much bigger than the aircrafts used by the GBYP Aerial Survey. The results of this additional survey should be reported to ICCAT-SCRS and ICCAT-GBYP by Italy, during one of the coming meetings.

It was decided to continuously monitor the sea surface temperatures and waves, with the purpose to have a better understanding of the various operative and environmental situations during the aerial survey campaign in 2010. The maps have been collected daily from <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](http://isramar.ocean.org.il/isramar2009/wave_model/default.aspx?region=coarse&model=wam) for the wave (**Figure 5**).

The aerial survey on spawning aggregation in 2010 was affected not only by the bureaucratic problems, but also by the unusual situation in terms of temperatures and winds. The surface temperature was unusually very cold in all the western and central Mediterranean till about mid-June, while even in the eastern Mediterranean the sea temperature was lower than usual in most of the areas till the last part of May. The strong winds and the bad weather conditions had a relevant presence in many days (**Figure 6**), much more than the 20% considered when planning the activities and the budget. As a matter of fact, according to a preliminary estimate, the average of unsuitable conditions for aerial survey, taking into account both the sea surface temperature and the wind, was 37.5% among the various areas, with a better situation in sub-area 6 (only 23% of unsuitable conditions) and a worse situation in sub-area 8 (56.4% of unsuitable conditions), but local winds were able to further reduce the operative days.

It is possible that the wind, in presence of marginal optimum temperature for spawning ( $>20.5^{\circ}\text{C}$ ), prevented the thermocline to be established at the right depth in various areas during the first part of the season. These environmental facts implied a delay in the bluefin tuna spawning activities in most of the areas and prolonged the survey activities, even if full details should be available later. The aerial survey data have been provided on schedule by all teams and the individual reports are already available.

This first year activity of aerial surveys is considered essential and extremely useful to better plan and refines the aerial surveys in the following years of the Programme, including the necessary preliminary official contacts with all CPCs interested by the Aerial Survey activities, in order to inform the local Authorities and get flight permits on time. This fact will allow also revising and adapting the aerial survey design according to the flight possibilities and then correlating the available budget with the maximum flight time. At the same time, the first year activity was very useful to detect gaps and areas for improving the quality of the survey, showing the need to have a dedicated short training course for the pilots, the professional spotters and the scientific observers in Phase 2, preliminary to the field activities.

#### **4. Data mining and data recovery**

The first preliminary activity was conducted at the ICCAT Secretariat. An analysis of the ICCAT data base on bluefin tuna was carried out, with the purpose to identify the most relevant gaps in the data series which are potentially useful for the stock assessment; 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 Tenders on this item was issued on April 13, 2010 (ICCAT Circular n. 1094/2010). Besides of the very large distribution of the Call, passed also to various national scientific networks, the ICCAT Secretariat received only one bid, which was not accepted after a cross-check with the bluefin tuna data base (May 28, 2010).

A second Call for Tenders was released immediately after, on June 11, 2010 (ICCAT Circular n. 2351/2010). This Call received five 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, all bids were accepted and the award was provided on July

30, 2010, to Direction des Pêches Maritimes (SEN), Fundación AZTI (SP), Institute of Marine Research (NO), Necton S.C. (IT) and Ricerca Mare Pesca (IT), along with the related contracts. The various proposed data sets, actually missing from the bluefin tuna data base, concerns about 180,000 specimens and a wide range of years and should improve the knowledge on several fisheries in various areas. A common format for transmitting the data to the ICCAT Secretariat was provided to all the contractors, with the purpose to get the data “ready to use” and in a format allowing their immediate incorporation in the bluefin tuna data base. Many data sets have been already provided to the GBYP on due time. The final report must be submitted by October 4, 2010.

A third Call for Tenders was issued on June 30, 2010 (ICCAT Circular n.2668/2010), specifically focused on the “Elaboration of 2010 Data from the Aerial Survey on Spawning Aggregations” within the Data Recovery Plan. The purpose of this Call was to make immediately available for the SCRS all the data obtained during the aerial surveys carried out by GBYP in 2010. This Call received only one bid. The tender, Alnilam Investigación y Conservación SL (SP), was awarded on August 6, 2010 and the contract was delivered on the same date. The report was provided on due time and the results are considered very useful for improving the aerial survey activities in the following years.

Target calls were issued about the collection and supply of satellite SST (Sea Surface Temperature) data sets and maps (call on September 8, 2010), where a contract was awarded to CLS Collect e Localisation Satellites (FR) on October 26, 2010 and data have been provided on November 11, 2011, and the elaboration of Aerial Survey data in correlation with SST data (call on October 20, 2010), where the contract was awarded to Alnilam Investigación y Conservación SL (SP) on October 29, 2010. The report was submitted on time, on December 2, 2010 and the results provide a first correlation between the sea-surface temperature and the bluefin tuna spawning aggregation, demonstrating the possibility to develop (with multi-year data) a prediction model which might be very useful for management purposes and for biological studies. The first examples of the outcome of the prediction model for detecting the areas with bluefin spawning aggregations is provided in **Figure 7** (June 2010) and figure 8 (July 2010).

The potentialities of these data elaborations for research and management purposes are considered very important, particularly working on multi-year data sets, on additional oceanographic parameters and refining the methodology year after year.

## **5. Tagging design**

This item was largely discussed, at first at the Secretariat level, and then with the Steering Committee, because of the various possible option of tagging techniques and their different possible use for the assessment. At the end of the discussion, which was very useful in scientific terms, it was decided to release a Call for Tenders for the Tagging Design on July 26, 2010 (ICCAT Circular 3122/2010). Besides of the very large distribution of the Call, passed also to various national scientific networks, the ICCAT Secretariat received only one bid. The Steering Committee, during its meeting on September 4 and 5, 2010, in agreement with the ICCAT Secretariat and the GBYP Coordinator, asked the tender to modify the proposal, in order to get a tagging design limited to the Eastern Atlantic and the Mediterranean, for conventional tags and PITs (and electronic tagging in Phase 3), asking to verify the practical tagging possibilities with tuna trap owners and purse-seine fishermen, and including a manual for tagging. The official request to modify the offer, also taking into accounts the revised and reduced budget adopted by the Steering Committee, was delivered on September 14, 2010 and the revised offer arrived on September 24, 2010. The contract was awarded to IEO (SP) on October 29, 2010 and the draft report is to be delivered before the expiry date of Phase 1. The draft report was provided on time and it is now under internal evaluation.

This item is considered extremely relevant, because it should provide a better estimate of natural mortality rates (M) by age or age-groups and/or total mortality (Z); it should provide also updated tagging reporting rates by major fisheries and areas, and it should improve the knowledge on the habitat utilisation and movement patterns of bluefin tuna in the various areas. It shall provide the base to carry out the tagging activities in the following years, with important implications on the GBYP budget.

## **6. Definition of GBYP Publication Policy, Editorial and Data Rules**

The need to have a clear and defined publication policy, along with editorial and data use rules, was one the first issue tackled within the GBYP coordination. The discussion was carried out at the Secretariat level, taking into

account the ICCAT rules in this sector and the SCRS statements, and the final document was officially adopted on March 15, 2010 (see **Annex 1**).

## **7. Steering Committee Meetings**

The Steering Committee meetings were not planned at the beginning of the activity, because of logistic difficulties. For this reason, it was a precise duty of the GBYP Coordinator to constantly inform by e-mail all the Members, about the detailed activities of the Programme and request their opinion when necessary. Apart from that, there was a continuous and productive contact with all Members, to better refine the various contents of the Programme.

The first informal meeting of the Steering Committee was held at the ICCAT Secretariat on April 23 and 24, 2010, to discuss about the aerial survey design and the aerial survey strategies.

The second informal meeting was held at the ICCAT Secretariat on June 19, 2010, to discuss about the Call for Tenders to be released and the various tagging options.

The third meeting, formal, was on September 4 and 5, 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. The meeting report was produced in real time and it will be posted on the new GBYP page within the ICCAT web page.

A fourth meeting was convened *ad horas* at the ICCAT Secretariat on 10, 11 and 12 September 2010, due to the information received about the availability of a reduced budget for the next two phases of the GBYP and the consequent need to revise the various items within the budget. Furthermore, the Steering Committee discussed some proposals forwarded by the participants at the Bluefin Stock Assessment meeting. The meeting report was produced in real time and it will be posted on the new GBYP page within the ICCAT web page.

A fifth meeting was convened *ad horas* at the ICCAT Secretariat on September 30, 2010, to discuss the revised proposal for the tagging design and various additional issues. The Steering Committee decided to request some additional details to the tender, and approved various items, including the request to ask for a prorogation of Phase 1 of the GBYP until December 12 and amend the contract with the cofounders accordingly. The meeting report was produced in real time and it will be posted on the new GBYP page within the ICCAT web page.

## **8. GBYP web page**

The ICCAT Secretariat, in agreement with the GBYP Coordinator, decided to add a GBYP page to the official ICCAT web page (<http://www.iccat.int/GBYP/en/index.htm>), with the purpose to provide full and transparent information about all the activities carried out by the GBYP.

The page was set-up by the Secretariat staff and the contents were provided by the GBYP Coordinator. The page will be regularly updated.

## **9. GBYP Phase 1 termination**

According to the Amendment of the Grant Agreement for Co-financing the “Atlantic-wide Research Programme for the Bluefin Tuna” – SI2.542789, provided by the European Commission on October 10, 2010, the termination of GBYP-Phase 1 was set on December 12, 2010.

## **10. Following activities**

According to the precise guidance of the GBYP Steering Committee, the next phases of the Atlantic-Wide Research Programme for Bluefin Tuna will include only activities able to provide fishery independent data and indices within the time-frame of the whole programme and in agreement with the GBYP general plan adopted by the SCRS and the ICCAT Commission. Due to the limited budget available for Phase 2 (2010-2011) some



activities already included in the original general planning have been temporarily excluded (i.e.: eggs and larval survey, intercalibration of aerial surveys), others have been delayed (i.e.: electronic tagging), while others (i.e.: conventional and PITs tagging) have been considerably reduced.

The Steering Committee and the GBYP Coordinator agreed to keep only the activities already initiated or absolutely essential for the programme, but confirming the need to follow the original list and volume of activities whenever appropriate funds will be available (Steering Committee meeting report 4-5 September 2010). For this reason, GBYP Phase 2 is considered a contingency minimal programme, while a similar strategy is planned for Phase 3 (Steering Committee *ad horas* meeting report, 10, 11 and 12 September 2010).

GBYP Phase 2 (under the reduced minimum budget perspective) will include the following activities, for a total budget of 2,502,000 Euro (including 10,000 Euro for contingencies):

- 1) **Coordination**, reinforcing the coordination team with two additional staff (1 G2.1 and 1 P2), due to the workload, and with contracts for the external members of the Steering Committee, for a total cost of 443,000 Euro.
- 2) **Data mining, data retrieval and data elaboration**, including data collection on juveniles from small scale and recreational fisheries, elaboration of VMS, environmental and aerial survey data, and a Symposium on tuna trap data issues, for a total cost of 149,000 Euro.
- 3) **Aerial surveys**, including a workshop to refine the activity, the revision of the aerial survey design, a training course for pilots, spotters and observers, and the 2<sup>nd</sup> year survey on spawning aggregations, for a total cost of 465,000 Euro.
- 4) **Tagging**, including conventional and PITs tagging and activities to improve tag reporting and tag recovery, with related rewards, for a total amount of 890,000 Euro.
- 5) **Biological sampling**, including hard parts sampling for ageing and micro-constituent analysis, genetic sampling and related analysis, for a total cost of 505,000 Euro.
- 6) **Modelling**, including only a workshop on modelling approaches, for a total cost of 40,000 Euro.

GBYP Phase 3 (still under the reduced minimum budget perspective) will include the following activities, for a total budget of 2,534,060 Euro (including 13,000 Euro for contingencies):

- 1) **Coordination**, for a total cost of 448,980 Euro.
- 2) **Data mining, data retrieval and data elaboration**, including data collection on juveniles from small scale and recreational fisheries, elaboration of VMS, environmental and aerial survey data, for a total cost of 123,000 Euro.
- 3) **Aerial surveys**, including the revision of the aerial survey design and the 3<sup>rd</sup> year survey on spawning aggregations, for a total cost of 404,080 Euro.
- 4) **Tagging**, including conventional and PITs tagging, a limited electronic tagging and activities to improve tag reporting and tag recovery, with related rewards, for a total amount of 965,000 Euro.
- 5) **Biological sampling**, including hard parts sampling for ageing and micro-constituent analysis, genetic sampling and related analysis, for a total cost of 490,000 Euro.
- 6) **Modelling**, including modelling trials, for a total cost of 90,000 Euro.

GBYP Phase 3 budget and activities will be revised by the Steering Committee and SCRS in the last part of Phase 2, according to the updated budget perspectives and the research needs.

The provisional calendar for the GBYP meetings is the following:

- Aerial Survey Workshop: February 14-16, 2011 (ICCAT Secretariat);
- Operational meeting on Tagging, February 17, 2011 (ICCAT Secretariat);
- Operational meeting on Biological Sampling: February 18, 2011 (ICCAT Secretariat);
- Symposium on Tuna Trap Fishery and data standardisation: May 23-25, 2011 (possibly in Morocco);
- Training course for aerial survey staff: May 19-20, 2011 (ICCAT Secretariat, provisional schedule)
- Meeting on Electronic tagging and Modelling Workshop: June 27 - July 1, 2011 (ICCAT Secretariat).

## 11. Recommendations

Following the first year experience, it is clear that the programme could better work if proper ICCAT rules will be in place, to provide the necessary support from all the CPCs concerned. Then, the following recommendations have been adopted by SCRS in its 2009 Plenary meeting, in view to ask the support of the ICCAT Commission:

- a) A stable system to ensure the regular funding of the Atlantic-wide Research Programme for Bluefin Tuna (GBYP) should be adopted by STACFAD and forwarded to the ICCAT Commission, in order to avoid yearly incertitude, to support the regular follow-up of the programme and provide all CPCs concerned a methodology to calculate their voluntary contribution.
- b) All CPCs concerned shall provide the necessary support to the Atlantic-wide Research Programme for Bluefin Tuna (GBYP) in order to:
  - support the ICCAT Secretariat initiatives in the framework of the Programme, particularly for contacts with the national Authorities concerned;
  - ensure assistance for the necessary permits concerning the GBYP activities in their territorial waters or airspace;
  - provide the necessary contacts in order to ensure the regular development of the programme.

## 12. Acknowledgments

The GBYP Coordinator 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.

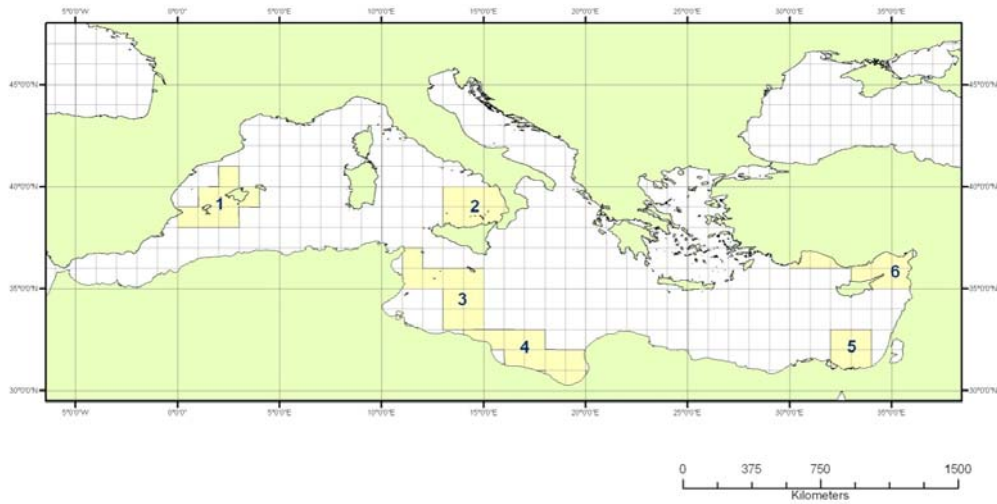
The Coordinator also acknowledges the strong collaboration of the GBYP Steering Committee, who responded very often in real time, particularly on very difficult scientific and practical issues.

A particular thank is to be given to the ICCAT Executive Secretary, Mr. Driss Meski, for the continuous support, the time availability and the dedication in professionally helping to solve many practical problems, even at night time.

**Table 1.** Summary status of the various items included in the first year activity of the GBYP.

<i>Item</i>	<i>Award date</i> or contract date	<i>Deliverables</i>		
		Preliminary report	Draft final report	Final report
Aerial survey design	05/04/2010	-	22/04/2010	01/05/2010
Aerial survey on spawning aggregations (1 to 6)	29/04/2010	20/06/2010	03/09/2010	22/09/2010
Aerial survey on spawning aggregations (7 and 8)	24/06/2010		03/09/2010	22/09/2010
Data recovery (5 contracts)	30/07/2010	06/09/2010	27/09/2010	04/10/2010
Data recovery – Elaboration of Aerial Survey Data	06/08/2010	06/09/2010	27/09/2010	04/10/2010
Tagging Design	03/11/2010	-	12/12/2010	tbd
Data recovery - Supply of SST data and maps	26/10/2010	01/11/2010	04/11/2010	26/11/2010
Data recovery - SST/Aerial Survey Data Elaboration	29/10/2010	-	02/12/2010	12/12/2010

## ATLANTIC-WIDE RESEARCH PROGRAMME ON BLUEFIN TUNA (GBYP - 2010)

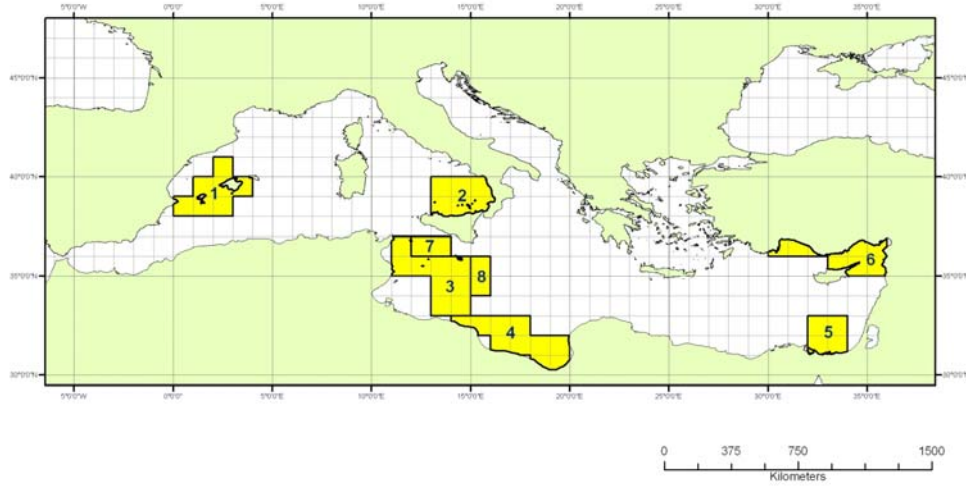


**Figure 1.** The 6 sub-areas identified for conducting the aerial survey on spawning aggregations in 2010, based on the 2008-2009 purse-seine fishing activity.

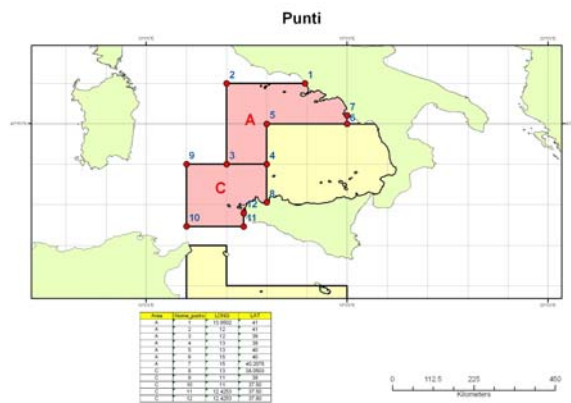


**Figure 2.** An example of the various aerial survey designs in all the sub-areas. First line, from left to right, tracks in sub-areas 1 to 3; second line, from left to right, tracks in subareas 4 to 6.

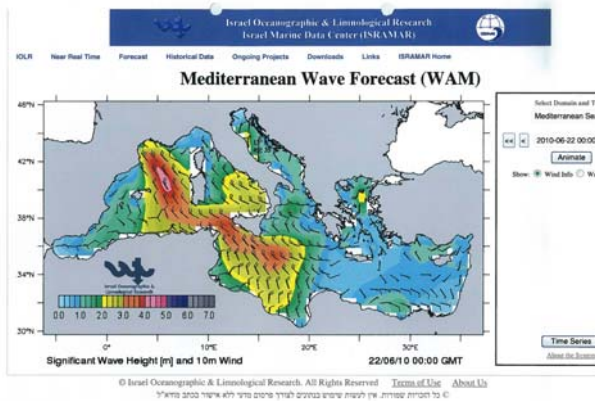
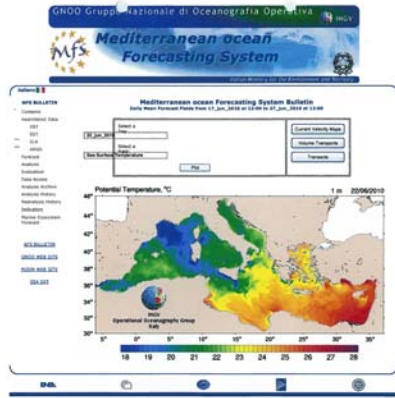
**ATLANTIC-WIDE RESEARCH PROGRAMME ON BLUEFIN TUNA  
(GBYP - 2010)**



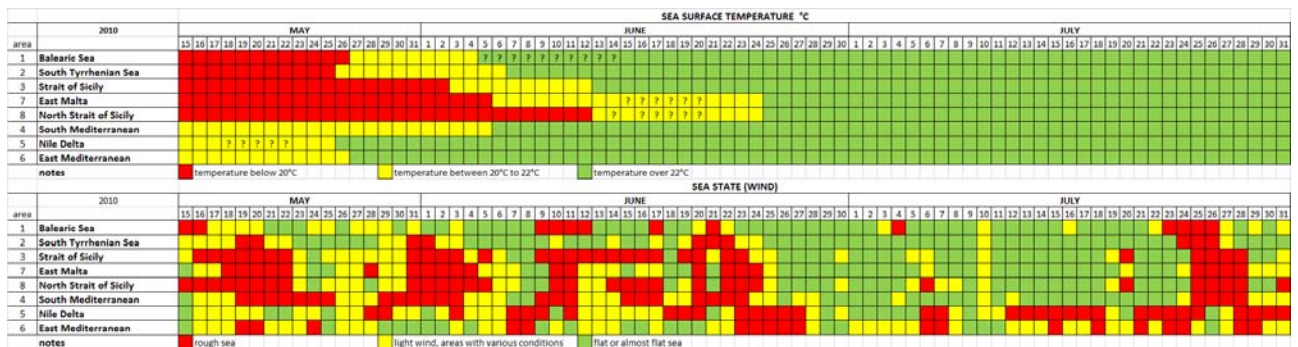
**Figure 3.** The updated map of all the 8 sub-areas identified for the aerial survey on spawning aggregations in 2010. The sub-areas 3 and 8 are not showing the zones where the survey activity was excluded due to the lack of permits from the Tunisian and Libyan Aviation Authorities.



**Figure 4.** The map of the two additional zones (A and C) attached to sub-area 2, where Italy decided to carry out an additional aerial survey in summer 2010.



**Figure 5.** An example (22 June 2010) of the daily maps for surface temperatures (left) and wave (right) collected by GBYP during the 2010 aerial survey campaign.



**Figure 6.** A first estimate of the environmental conditions during the GBYP Aerial Survey in 2010 in the various sub-areas. *Upper panel:* shows the average surface temperatures, confirming the relevant delay for establishing the proper temperature for spawning in the western and central Mediterranean Sea; *Lower panel:* shows the sea state conditions, which clearly indicates the difficulties for carrying out the survey in many sub-areas, due to the strong winds during spring 2010.



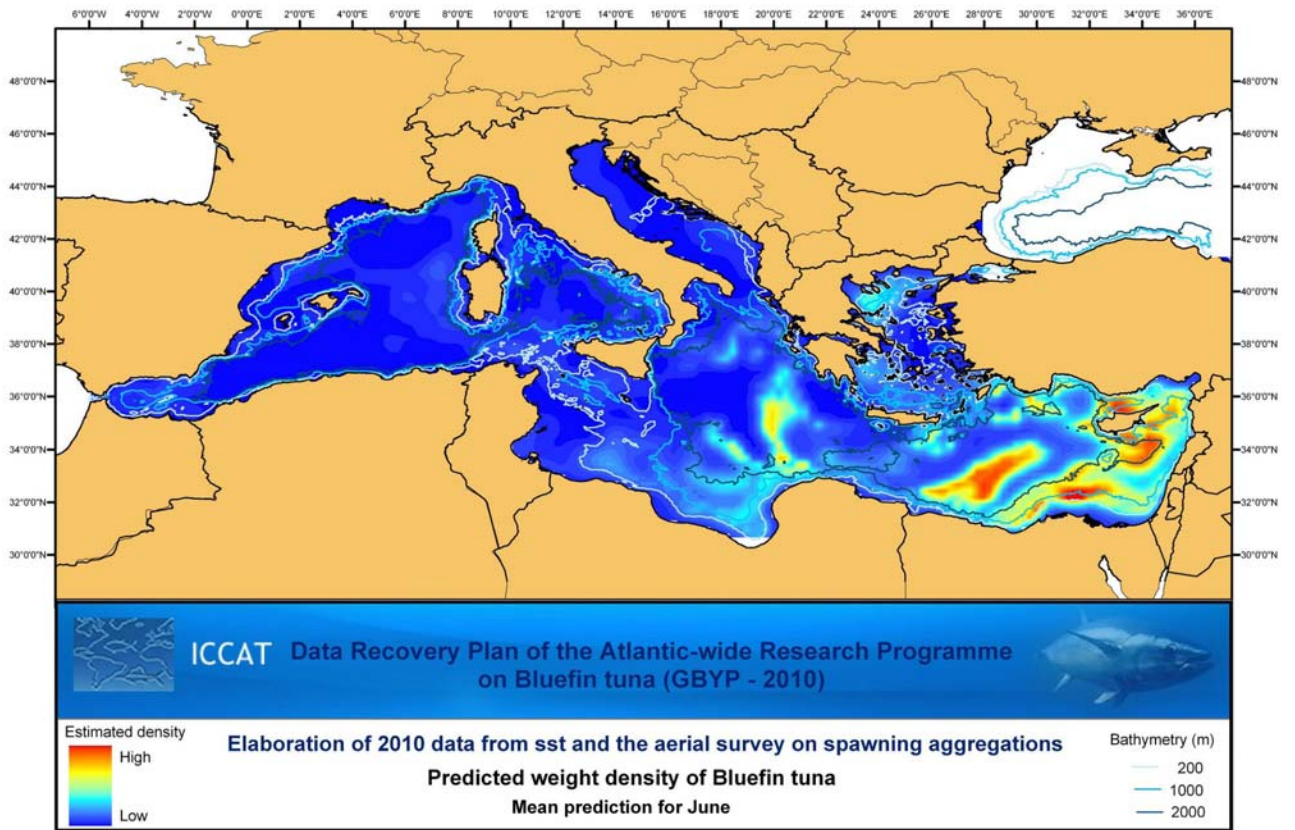


Figure 7. Predicted density of bluefin tuna spawning aggregations in June 2010.

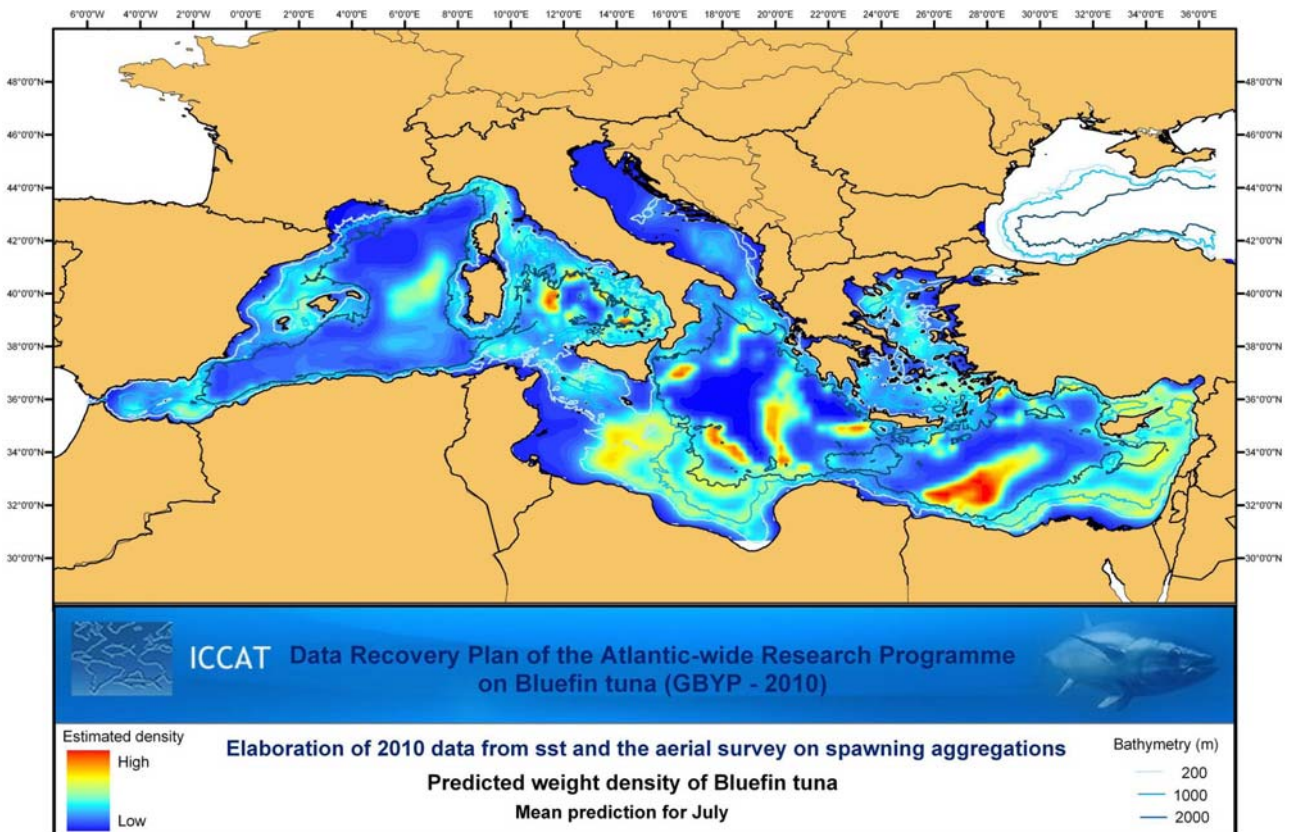


Figure 8. Predicted density of bluefin tuna spawning aggregations in July 2010.

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

The ICCAT Atlantic Wide Research Programme for Bluefin Tuna (GBYP) is an international research, co-funded in its first Phase by the European Community (80%), Canada, Croatia, Japan, Norway, Turkey, United States, Chinese Taipei and ICCAT Secretariat.

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), funded by the European Community (grant SI2/542789), Canada, Croatia, Japan, Norway, Turkey, United States, Chinese Taipei and the ICCAT Secretariat. 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 does it necessarily reflect the views of the funders and in no ways anticipate the Commission’s future policy in this area.”
- 5) 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.