



Madrid, 25 November 2015

**ICCAT CIRCULAR # 08080 / 2015**

**SUBJECT: TERMS OF REFERENCE – CALL FOR TENDERS – ICCAT-GBYP (08/2015)  
COST-BENEFIT ANALYSES OF GBYP RESEARCH ACTIVITIES;  
INCLUDING POWER ANALYSIS AND ASSESSMENT OF NEW  
INFORMATION (ICCAT-GBYP Phase 5)**

I have the honour to transmit to you the attached Call for Tenders ICCAT-GBYP 08/2015 for “Cost-benefit analyses of GBYP research activities; including power analysis and assessment of new information” of the ICCAT Atlantic-Wide Research Programme on Bluefin Tuna (ICCAT/GBYP).

Please accept the assurances of my highest consideration.



Driss Meski  
*Executive Secretary*

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## CALL FOR TENDERS ICCAT GBYP 08/2015

### COST-BENEFIT ANALYSES OF GBYP RESEARCH ACTIVITIES; INCLUDING POWER ANALYSIS AND ASSESSMENT OF NEW INFORMATION

#### ATLANTIC-WIDE RESEARCH PROGRAMME ON BLUEFIN TUNA (ICCAT GBYP – PHASE 5)

##### ICCAT GBYP background and objectives

The main objectives of the ICCAT Atlantic-Wide Bluefin Tuna Research Programme (GBYP) are to improve: (a) the understanding of key biological and ecological processes, (b) current assessment methodology, (c) the management procedures, and (d) advice.

Key tasks are to reduce uncertainty in stock assessment and to provide robust management advice. This requires improved knowledge of key biological processes and parameters. However, currently almost all the data used in stock assessments are obtained from the fisheries-dependent data. It is therefore important to obtain data from alternative sources, i.e. aerial survey or tagging studies, in order to verify the assumptions made when conducting the assessments.

Important parts of the major research tasks under the ICCAT Atlantic-wide Bluefin Tuna Research Programme (GBYP) are an aerial survey on bluefin spawning aggregations in the Mediterranean Sea, a large, wide and intensive scientific tagging program to address several important biological and ecological topics regarding Atlantic bluefin tuna, and an Atlantic-wide sampling programme including a wide range of biological studies (ageing, genetics, micro-chemistry and otolith shape analyses).

The comprehensive GBYP activities were initially assessed by a panel of external reviewers in 2013 ([http://www.iccat.int/GBYP/Documents/RESEARCH/GBYP\\_Mid-Term\\_Review2013.pdf](http://www.iccat.int/GBYP/Documents/RESEARCH/GBYP_Mid-Term_Review2013.pdf)). The ICCAT GBYP Steering Committee recommended to carry out analyses on the main GBYP research activities before the end of Phase 5 (February 21, 2016), in order to have a more focused overview of the works carried out so far and have further details for adopting the best research strategy in Phase 6.

At the 2015 SCRS meeting it was recognised that if the GBYP continues to use the same methods without evaluating how the data and knowledge gained will improve the scientific advice framework, the programme may fail to meet management objectives. To avoid this potential risk it is essential to conduct a cost/benefit analysis to help design a programme which will meet the programme objectives in a cost-effective way. This also requires a clear definition of objectives and milestones to monitor progress.

SCRS/2015/146 detailed how to conduct a power analysis for one of the GBYP programmes, specifically for the aerial survey. The benefits of a particular aerial survey design also depend on the knowledge gained by other programmes of the GBYP, i.e. on population structure and behavior. Conducting a full cost-benefit analysis of the main research programmes of the GBYP, however, will not allow a decision on the aerial survey programme to be made before the start of the 2016 campaign.

Taking into account that the recent SCRS BFT species group meeting clarified that several fishery-related indices could not be updated and therefore used in the next assessment (i.e. the baitboat fishery in the Bay of Biscay or the trap fishery which will now be moving the catches into farms), the potential importance of any additional GBYP data may be increased for future assessments and for the MSE process.

ICCAT GBYP will provide all necessary details on the activities carried out so far, including some indices which take into account costs.

ICCAT is publishing this announcement in order to select individual experts, public institutions or private entities to submit offers in order to carry out the various analyses and evaluations as requested below.

It will be possible to submit offers either for each individual item or for all items.

## ITEM A: Power analysis and cost-benefit analysis for the ICCAT GBYP aerial survey on bluefin tuna spawning aggregations

### Objectives

The contract is for an evaluation of the costs and benefits of alternative aerial survey designs and of incorporating data and knowledge from other GBYP programmes when developing a fishery independent stock index. The primary objective of the analyses to be performed under this call is to evaluate whether the aerial survey can provide a reliable and robust index of abundance of the spawning stock with sufficient precision to be used in BFT stock assessment. The evaluation needs to be undertaken taking into account the likely available resources for the aerial survey and the logistical and political constraints under which the survey operates.

To do this requires evaluating the CV of estimates taking into account both measurement and additional variance due to process errors. Based on these estimates a power analysis is to be conducted to determine how long it would take to detect a significant change in the East Atlantic & Mediterranean spawning stock, given the current GBYP programme design and knowledge. Following this, potential improvements to and/or alternative aerial survey designs with costs should be evaluated. These alternatives need to be within the resource, logistical and political constraints under which the survey operates. This should include an analysis and discussion of how improving knowledge of process errors, i.e. those that affect spatial and temporal distribution, can be used to increase the power of the aerial survey. For example the use of tagging data to adjust the estimates. An evaluation of alternative designs should be included (e.g. monitoring of main spawning areas with more replicates versus carrying out an extended survey with few replicates).

The main tasks (ToRs) are

1. Review how the different designs used in the first four years of the survey affected the results (including the spatial extent of the survey, the timing of the survey, its duration, the range of planes and spotters utilized, methods for estimating perpendicular distances, use of bubble windows);
2. Estimate the additional variances associated with the current indices. This needs to include inter-annual variability in spatial and temporal distribution of spawning schools and school size. Important factors include the lack of calibration in the estimates of school sizes, inter-annual variability in surfacing behavior (e.g. the proportion of schools which are detectable), the likelihood that  $g(0)$  for schools at the surface is one and, if not, the effect of different platforms and inter-annual variability in school sizes on  $g(0)$ . The aerial survey data already collected should be used in these evaluations (see Quilez Badía *et al.*, 2016<sup>1</sup>);
3. Evaluate the use of electronic tagging or other data to evaluate spatial and vertical differences between spawning seasons and provide an estimate of additional variance independently of 2. This needs to include an evaluation of the precision and accuracy with which these can be estimated from the available data and assumptions;
4. Compare the additional variance estimates with the estimates of survey variance obtained using DISTANCE<sup>2</sup> under a variety of assumptions related to number of transects, spatial and temporal coverage, population structure;
5. Based on the above evaluation whether the aerial survey can provide a reliable and robust index of abundance for use in stock assessments. This should include but not be limited to a statistical power analysis to determine how long it would take to detect a significant change in the East Atlantic & Mediterranean stock, given the current GBYP programme design, and knowledge and associated costs; and
6. Evaluate alternative aerial survey designs. These should include consideration of improvements to the current methodology that may improve the consistency and scientific rigour of the survey. They should also consider the approaches for calibrating estimations of school size and fish sizes (including the feasibility of different approaches and potential for such calibrations to improve the actual precision of the survey estimates).

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<sup>1</sup> Quilez Badía G., Tensek S., Di Natale A., Pagá García A., Cañadas A., Kell L., in press, An estimate of additional variance for the ICCAT GBYP aerial survey using electronic tags data. SCRS/2015/146.

<sup>2</sup> <http://distancesampling.org/>

## Deliverables

#1 Draft final report to be submitted at the latest by **8 February 2016**, including

**D1:** A comprehensive review of the ICCAT GBYP surveys conducted so far (task 1) and an analysis of the power of the current design to detect changes in the stock for a range of population growth rates.

**D2:** An analysis of the design and costs to detect a range of population growth rates in 3, 5 and 10 years with no reduction in additional variance.

**D3:** An analysis of the design and costs to detect a range of population growth rates in 3, 5 and 10 years with a reduction in additional variance. This should include a discussion of how other programmes under the GBYP, e.g. tagging or a better understanding of habitat usage should be designed. The deliverable shall include also the estimate requested under point 7 of the Tasks.

**D.4:** An Executive Summary, including recommendations.

#2 The final report, to be prepared taking into account any comments provided by ICCAT, to be submitted by **19 February 2016**, at the latest.

## ITEM B: Cost-benefit analysis for the ICCAT GBYP tagging programme

### Objectives

The analysis should take into account how tagging activities and tag awareness (the programme included tagging design, conventional and electronic tagging, tag awareness and rewarding programme) were carried out each year according to the various strategies, including costs, the spatial and logistic constraints, and the tag recovery rate, over the full duration of the GBYP. The first part of a feasibility close-kin tagging study was included in the last part of Phase 5.

Following this, possible alternative tagging strategies with costs may be proposed. This should also include a discussion of how improving knowledge on factors that affect spatial and temporal distribution can improve the power of all other research activities, as well as the most adequate strategy (conventional tagging, pop-up satellite tags, internal archival tags, close-kin genetic tagging, areas where efforts should be concentrated). Any proposals should detail the proposed methodology, e.g. based on the Value-of-Information (i.e. Mäntyniemi *et al.*, 2009)<sup>3</sup> or the risk of failing to meet management objectives.

The main tasks are

1. Review the extent to which the different strategies in the first years of the tagging activities have achieved the objectives (taking into account the objectives of each year, the available budget by Phase and the logistic constraints), including the cost-benefit of the tagging activity, taking into account both the potential for obtaining direct estimates of mortality, and abundance as well as indirect contributions such as determining the fraction of time bluefin tuna spend at the surface where they may be seen by aerial surveys. The analysis should reflect on the relative utility of the recoveries obtained during the scientific tagging expeditions and from the fishery. Note that PIT tagging was initially intended but for administrative reasons was not possible to implement;
2. Review the use of electronic tag data for mixing and stock structure purposes and to evaluate spatial and vertical differences between spawning seasons in the Mediterranean;
3. Propose and evaluate alternative tagging strategies using an appropriate methodology.

### Deliverables

#1 The draft final report to be submitted at the latest by **8 February 2016**, including comments on:

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<sup>3</sup> Mäntyniemi, S., Kuikka, S., Rahikainen, M., Kell, L.T., and Kaitala, V. 2009. The value of information in fisheries management: North Sea herring as an example. *ICES J. Mar. Sci.* 66(10): 2278–2283. doi: 10.1093/icesjms/fsp206

I. The scientific report, taking into account the relevant scientific literature, containing the following elements:

**D1:** A comprehensive review of the ICCAT GBYP tagging activities conducted so far, specifically dealing with Task I, and a cost-benefit analysis, taking into account any available index, including any possible improvement for the BFT assessment or use in the MSE process induced by the results of the GBYP tagging activities.

**D2:** An analysis of how GBYP tagging has improved the knowledge of bluefin tuna distribution, growth and behavior, taking into account Task II and III or has the potential to do so with additional analyses of the data already collected.

**D3:** Taking into account the original tagging design, the objectives, the different strategies in the various years and the results obtained thus far, propose future strategies or improvements, taking into account the cost and the logistic constraints.

**D.4:** An Executive Summary, including recommendations.

#2 The final report, to be prepared taking into account any comments provided by ICCAT, to be submitted by **19 February 2016**, at the latest.

### **ITEM C: Cost-benefit analysis for the ICCAT GBYP biological studies programme**

#### **Objectives**

One of the main objectives of the GBYP is to improve the understanding of key biological and ecological processes for Atlantic bluefin tuna. As part of this programme, biological samples have been collected since 2011 using a sampling design across the main bluefin fisheries. Data collected includes those on age, length, weight, sex, maturity, fecundity, otoliths shape and tissue samples for genetic and micro-chemical analyses for identification of sub-populations. Under this programme objectives are to generally increase biological knowledge and specifically to collect sufficient samples to produce age-length keys and to identify population components.

The cost-benefit analysis should evaluate how the biological studies carried out thus far have achieved these objectives, taking into account the funding allocated, the logistic constraints and the strategies adopted in each Phase. Following this, alternative designs with associated costs should be proposed. Any proposals should detail the proposed methodology, e.g. based on the Value-of-Information (Mäntyniemi *et al.*, 2009)<sup>3</sup>.

The main tasks are

1. Review how the activities conducted in previous phases (including the sampling design adopted for ageing, genetics, micro-chemistry and otolith-shape analysis) have achieved the objectives, taking into account costs and logistic constraints;
2. Review the potential improvements in knowledge about bluefin tuna biology, population structure and natal origin and their possible use for other GBYP research activity (i.e. tagging, modelling);
3. In particular, evaluate the precision and bias of alternative age-stock keys given uncertainty, i.e. the ability to assign samples of fish to a cohort and stock, i.e. under a variety of hypotheses about growth and population structure;
4. Propose and evaluate alternative sampling schemes using an appropriate methodology. In particular, strategies for being able to obtain annual age-length keys and estimates of the stock mixing proportions captured by the different fisheries.

#### **Deliverables**

#1 The draft final report to be submitted at the latest by **8 February 2016**, including comments on:

I. The scientific report, taking into account the relevant scientific literature, containing the following elements:

**D1:** A comprehensive review of the ICCAT GBYP biological studies conducted so far, according to Task I.

**D2:** An analysis of how GBYP biological studies had improved knowledge on bluefin tuna biology and population structure, taking into account, i.e. by comparing the improvement in biological parameters used in the 2014 assessment.

**D3:** An evaluation of alternative multi-annual biological sampling programmes.

**D.4:** An Executive Summary, including recommendations.

#2 The final report, to be prepared taking into account any comments provided by ICCAT, to be submitted by **19 February 2016**, at the latest.

#### **Contractor minimum qualifications**

- Documented experience in bluefin tuna or tuna-species studies; previous experience in power analysis (for the aerial survey only), research programme assessment and cost-benefit analyses will be preferred;
- PhD or University degree in biological, natural, environmental or fishery sciences or related fields;
- Excellent working knowledge of one of the three official languages of ICCAT (English, French, Spanish). A high level of knowledge of English is highly desirable.

#### **Request for proposals**

Interested expert(s) should submit a proposal to the attention of Mr. Driss Meski, the Executive Secretary of ICCAT, at the following address: [driss.meski@iccat.int](mailto:driss.meski@iccat.int) by **13 December 2015**, including:

- a) Acknowledgment of this Call for tenders (ICCAT GBYP 08/2015);
- b) A detailed proposal, based on the objective of this Call for tenders (TORs), specifying the Item(s) for which the bid is being submitted. Departures from the TORs may be made with justification;
- c) The curriculum vitae in case of individual expert, including personal address, contact, and the tax ID code;
- d) A preliminary estimated budget for carrying out the work (overhead to cover administrative and general costs could be admitted within a maximum limit of 10% of the personnel costs for non-individual entities);
- e) The name, address, and telephone number of the expert(s);
- f) The bank account of the expert (bank name, account number, IBAN and SWIFT codes) and, if applicable, the IVA=VAT identification code; in case of cooperative proposals, the payments will be provided to the main investigator;
- g) A detailed list of any subcontracting activities;
- h) A declaration that the expert(s) will follow the terms of the present invitation, and/or approved modifications agreed upon, and the administrative rules specified in the contract;
- i) A declaration that all the comments eventually made on the draft final report (Deliverable #1) will be incorporated in the final report (Deliverable #2), for each Item.
- j) A declaration that the expert(s) is covered by full insurance for the work to be carried out according to the present invitation, excluding ICCAT from all responsibility concerning the job to be done;
- k) A statement specifying the extent of agreement with all terms, conditions, and provisions herein included, particularly specifying the date for the draft final report (**Deliverable #1**) and the date for the final report (**Deliverable #2**), for each Item.

The ICCAT Secretariat will make a selection of the proposals and will immediately notify the result of the selection process.

Proposals that fail to furnish the required documentation or information, or that reject the terms and conditions of this invitation will not be considered.

Contractors can be either single experts or a group of experts having the qualifications required.

The Contractor should be available to report to any meeting requested by ICCAT.

#### **Payment details**

Taking into account the strict schedule for carrying out the work, disbursements will be made according to the following schedule:

1. 40% of the total amount of the contract upon **signing of the contract**;
2. 60% after the approval of **Deliverable #2** upon incorporation of comments by ICCAT and the approval of any administrative document.

#### **Logistics**

All documents provided by the Contractor must be in MS Word or compatible software; tables must be in Excel format or compatible; figures and pictures must be in JPEG or TIFF format or compatible. All documents submitted must be in English, French or Spanish.

#### **Copyright**

All the material produced by the Contractor will remain the property of the ICCAT GBYP and cannot, in any case, be circulated by the Contractor selected.

For further information concerning this invitation, please contact the ICCAT GBYP Coordinator at the following address: [antonio.dinatale@iccat.int](mailto:antonio.dinatale@iccat.int)