INTERNATIONAL COMMISSION FOR THE
CONSERVATION OF ATLANTIC TUNAS

COMMISSION INTERNATIONALE POUR LA
CONSERVATION DES THONIDES DE L'ATLANTIQUE

COMISION INTERNACIONAL PARA LA
CONSERVACION DEL ATUN ATLANTICO

Madrid, 14 May 2021

ICCAT GBYP CIRCULAR # 0352/2021

SUBJECT: CALL FOR TENDERS ICCAT GBYP 03/2021 – MODELLING AND MSE - M3 & ABTMSE R PACKAGE CODE REVIEW - ATLANTIC-WIDE RESEARCH PROGRAMME FOR BLUEFIN TUNA (ICCAT GBYP – PHASE 11)

I should like to transmit the Call for Tenders ICCAT 03/2021 – Modelling and MSE - M3 & ABTMSE R package code review - Atlantic-Wide Research Programme for Bluefin Tuna.

I would be grateful if you could distribute this Call for Tenders to qualified people and institutions that might be interested.

Please accept the assurances of my highest consideration

Executive Secretary

Camille Jean Pierre Manel

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Attachment: Call for tenders 03/21.

CALL FOR TENDERS ICCAT GBYP 03/2021
MODELLING AND MSE - M3 & ABTMSE R PACKAGE CODE REVIEW

ATLANTIC-WIDE RESEARCH PROGRAMME ON BLUEFIN TUNA
(ICCAT GBYP – PHASE 11)

Background and objectives

ICCAT's Standing Committee on Research and Statistics (SCRS) has developed a Management Strategy Evaluation (MSE) framework for several species as recommended by the KOBE process. This approach allows current and alternative assessment and advice frameworks to be evaluated with respect to their ability to meet multiple management objectives with acceptable levels of risk.

Initial focus on an Atlantic Bluefin Tuna MSE started in 2018, with some development of the framework to use in the OM development, which was further developed during 2019 and 2020 and the process is ongoing in 2021. Consistent with the MSE implementation Roadmap adopted by the Commission, in 2021 the SCRS is initiating an independent peer review of MSE code. Accordingly, there is a need to hire a MSE Code Technical Expert(s) to work directly with the bluefin tuna MSE developers, the Bluefin Tuna Species Group and its Rapporteur, the SCRS Chair and Vice-Chair, and in consultation with the Secretariat to review the code and algorithms used, and verify whether it performs as expected. The expert should also suggest improvements to the code used to perform the simulations.

For several years the Bluefin Tuna Species Group has recorded MSE technical specifications in a Trial Specifications Document (TSD). This covers a wide range of issues including data processing, fleet structure, operating model structure, likelihood functions for model conditioning and statistical properties of data for projections. Where applicable the TSD includes mathematical equations that can be directly compared to ADMB and R code. The primary purpose of the code review is to check that the description of the operating model detailed in the TSD is correctly implemented in the code of the M3 model and the ABTMSE R package. The review is not focused on the suitability of the specifications described in the TSD.

Components of code review

There are three principal components of the Atlantic bluefin tuna MSE framework:

(1) The M3 ADMB model used to condition the operating model on data;
(2) R Code to organize data and model inputs for use in the operating model conditioning (e.g. formatting of data, calculation of master indices, specification of selectivities for fleets and survey indices, likelihood weights for data types, etc.);
(3) An R package that recreates the ADMB conditioning model equations and allows for closed loop simulation testing of CMPs in projection years.

Tentative schedule for code review

Tasks to be completed by the BFT MSE Contractor and provided to the Code Review Contractor according to this schedule:

- A reconditioning of the model is scheduled for April to mid-May 2021 which would alter code for organising data (component 2), conditioning and also the R code of the forward projections (component 3), but will not affect component 1. In order to make initial progress with a code review is it therefore efficient to organize it in relation to these components.
  - Component 1 (by the end of April). Provide fully commented M3.tpl to the external reviewer cross referenced against the latest version of the TSD.
  - Component 2 (by the end of June). Provide a complete set of R scripts for processing data and fitting the M3 model, again commenting and cross referencing all code against the relevant sections of the TSD.

- o Component 3 (by the end of July). Provide a complete set of R scripts for converting fitted M3 models into operating models of the ABTMSE package and then doing closed loop projections.
- A note on 'internal' code checking completed so far.
- The historical reconstruction of the M3 model is recreated in the R framework and these have been checked for consistency (matching of all quantities to the sixth decimal place). It follows that any coding errors in the population and fishing dynamics of the M3 model would have to be recreated exactly in the R coding language which is relatively unlikely. The current version of the R package includes these checks as an argument to the function used to run MSEs.
- Line-by-line checking of R package code for projecting indices and recruitment has gone through relatively detailed scrutiny during an informal code review in 2020.

Contractor tasks

The code reviewer will review the code and algorithms used in the Bluefin Tuna MSE, and verify whether it performs as expected, including:

- Check code to ensure correct recreation of TSD equations in code of M3.tpl file and ABTMSE R package;
- Identify code that is used in modelling that is not documented in the TSD;
- Identify areas where code may be made more computationally efficient;
- Participate in the 2nd Intersessional Meeting of the Bluefin Group Tuna Species Group (2-9 September 2021) and present the report of the review;
- Review any code revisions provided by the MSE Contractor by 1 November 2021 and provide final report on or before 1 December 2021.

Deliverables

#1 Initial report. A comprehensive and well documented report, detailing the review process conducted, shall be submitted by **22 August 2021**.

#2 SCRS Report. The report shall be presented as an SCRS document to the online 2nd Intersessional Meeting of the Bluefin Tuna Species Group (**2-9 September 2021**).

#3 Draft final report. If comments are provided by the Bluefin Tuna Species Group, the SCRS and/or the Secretariat on the basis of this review, the MSE Contractor shall take these into account and provide a revised version of the code and algorithms no later than **1 November 2021** to the Code Review Contractor. This will be forwarded to the Code Review Contractor for a second round of review and incorporated into a draft final report, to be provided by **22 November 2021**. This will give the ICCAT SCRS Chair and Vice-Chair, the Bluefin Tuna Species Group Coordinator and Rapporteurs, and the Secretariat time to comment before the final report is approved.

#4 Final report. The final report shall be prepared taking into account any revisions to the code and comments on the draft final report provided by the ICCAT SCRS Chair and Vice-Chair, the Bluefin Tuna Species Group Coordinator and Rapporteurs, and the Secretariat, shall be submitted by **1 December 2021** at the latest.

Contractor minimum qualifications

☑ At least a MSc or equivalent experience in the relevant sciences, e.g. Mathematics, Statistics, Engineering, Fisheries Science, Marine Biology, Natural Sciences, Biological Sciences, Environmental Sciences or a closely related field.

☑ Experience in participating in interdisciplinary and international Working Groups and/or projects.

☑ Demonstrated experience in quantitative methods, system modelling and software design.

☑ Demonstrated experience in design and implementation of Management Strategy Evaluation and stock assessment models, preferably for highly migratory species.

☑ Strong working knowledge and ability to programme in major software used in fisheries stock assessment and MSE, in particular, R, ADMB and C++.

☑ Strong working knowledge and ability to develop and maintain contemporary programme documentation systems.

☑ Strong working knowledge and ability to develop and maintain relational databases suitable for efficient storage and archiving of data sets and their use in stock assessment and MSE.

☑ Excellent working knowledge of one of the three official languages of ICCAT (English, French and Spanish). A high level of knowledge of English is highly desirable.

☑ Good communication skills with scientists, managers, and stakeholders with the ability to explain the essence of complex technical objectives, results and implications of OMs and Management Procedures (MP) to a non-technical audience.

Request for bids

Interested entities should submit an offer to the ICCAT Executive Secretary (camille.manel@iccat.int), with copy to Ms. Ana Martinez (ana.martinez@iccat.int) by **31 May 2021**, including:

a) Description of methodology to be used;
b) Detailed budget proposal, including estimated number of days of work;
c) Short *Curriculum vitae* of the tender (in case of individual scientists, i.e. the 5 most relevant papers and involvement in recent MSE and or stock assessment projects);
d) Name, address, and telephone number of the tendering body;
e) Institutional and administrative background of the tendering body (e.g., statutes, type of institution, annual budget, budget control procedures, etc.), if applicable;
f) Acknowledgement of this Call for Tenders; and
g) Statement specifying the extent of agreement with all terms, conditions, and provisions herein included.

Offers sent after the deadline or that fail to furnish the required documentation or information, or reject the terms and conditions of the Call for Tenders will not be considered.

Contractors can be either individual scientists or public or private scientific institutes, or other entities having the qualifications required.

If the tender is submitted by an institute, it must indicate the expert(s) who will be dedicated to the design and programming tasks and that he/she will be available to participate in this project over the next 2-3 years, if funds are secured.

Selection of bids

The ICCAT Secretariat will make a selection of the offers. Following the selection process, the ICCAT Executive Secretary will notify the entity selected for the contract as soon as the selection process is completed.

Contracts will be awarded on the basis of competitive tendering and the evaluation of proposals will be undertaken objectively, consistently and without bias towards particular suppliers. Tenders will be evaluated against a pre-determined set of criteria, which include: (i) cost; (ii) proven track record; (iii) technical merit based on work plan; (iv) flexibility to future changes to requirements; and (v) contribution to the overall objectives of the ongoing ICCAT MSE process for bluefin tuna.

The ICCAT Secretariat will examine each tender received and make recommendations as to which tender is the most economically advantageous. Once the decision to award the contract has been made, both the successful and unsuccessful tenders will be notified.

Duration of the contract

The work under this contract shall be concluded by **1 December 2021**. If required, the contract is open for extension, depending on funding availability and on the priorities of the ICCAT MSE process for Atlantic bluefin tuna.

Payment details

Disbursements will be made according to the following schedule:

1. 20% of the total amount of the contract upon **signature of the contract**;
2. 30% upon completion and acceptance of **Deliverable #2**;
3. 30% upon completion and acceptance of **Deliverable #3**;
4. 20% after the approval of the final report (**Deliverable #4**) upon incorporation of comments eventually made by the SCRS Chair and Vice-Chair, the Bluefin Tuna Species Group Coordinator and Rapporteurs, and the ICCAT Secretariat.

Logistics

The text report shall be in MS Word or compatible software. All other documents provided by the contractor must be in Open Office, Latex or compatible software. All documents submitted must be in English, French or Spanish.

Copyright

All of the material produced by the Contractor will remain the property of GBYP and it must be kept confidential. All software written by the Contractor will be licensed under GLP or similar open source license.

For further information concerning this Call for Tenders, please contact the GBYP Coordinator at the following address: francisco.alemany@iccat.int