

ICCAT GBYP CORE MODELLING MSE GROUP
Report of the 5th Meeting
ICCAT Secretariat, Madrid, Spain
19, 22, 23 and 28 July 2017

1) Opening of the CMMG meeting

The meeting opened at 10-30 am on 19 July, and adopted the draft agenda.

2) Participants:

Members: Haritz Arrizabalaga, Doug Butterworth, Tom Carruthers, Paul De Bruyn, David Die, Antonio Di Natale, Ana Gordo, Laurie Kell, Toshihide Kitakado, Polina Levontin, Gary D. Melvin, Clay Porch; invited experts: Ai Kimoto and Shuya Nakatsuka.

3) Nomination of the Chair

Doug Butterworth was nominated as Chair.

4) Nomination of the rapporteurs

Antonio Di Natale and Tom Carruthers were nominated as rapporteurs.

5) Adoption of the Agenda

The draft agenda (attached to this report as Appendix 1) was adopted.

6) Activities to be conducted in line with the proposals set by the CMMG in March 2017 and shared with the ICCAT SCRS Bluefin Tuna Species Group

The group noted the schedule set out at the March meeting, and that the agenda had been developed to address this. Arrangements would be made to report progress to the bluefin tuna assessment meeting taking place in parallel, so that they were kept fully informed.

7) Consideration of report on refined conditioning of OMs

Tom Carruthers presented his report on progress on this item. Certain data inconsistencies were noted and corrected, and the conditioning was updated during the course of the meeting taking these corrections and other suggestions (particularly towards establishing consistency with assumptions being made for the 2017 assessment) into account.

6) Consideration of the updated conditioning itself

The conditioning was checked against a full cross of the two scenarios related to abundance levels and four related to demographics (higher and lower M values and younger and older spawning) which had been specified previously. Particular importance was laid on absence of trends in fits of the OMs to the abundance indices, as well as on over-lengthy series of residuals of the same sign. The results for west and east areas (note: areas, not stocks of origin) were also compared to those from the simultaneously ongoing 2017 assessments runs (both VPA and SS3).

The main result from this exercise was identification of the need to have the range of Reference Set OMs better capture the range of behaviours shown by the assessments. This results in replacement of the two existing scenarios for abundance levels by three:

- i) the best fit of the OM to the data;
- ii) introduction of a penalty function to force the ratio of absolute abundances for the west and east areas to better match results for the assessments; and
- iii) introduction of a penalty function to force a three-fold increase in biomass over the last decade in the east area, to better match the patterns shown in the assessments.

The group then went on to reconsider the selection of indices for which future simulated data would be generated for potential use by Candidate Management Procedures (CMPs). Emphasis was laid on having indices for both large and small tuna, having fishery-independent (e.g. survey) as well as fishery-dependent (e.g. CPUE) abundance index data, and having indices which did not evidence lengthy trends of positive or negative residuals in fits to the OMs for greater ease modelling and reliability of future data generated. Furthermore the indices selected needed to be such that their future annual availability was highly likely. In the light of these considerations, the following revised set of indices was selected to provide potential CMP inputs:

West

Gulf of Maine larval survey
Japanese longline
US rod and reel: 115-144 cm

East

Mediterranean larval survey
French aerial survey in the Gulf of Lyon
Mediterranean aerial survey
Japanese longline in the Northeast Atlantic

Tom Carruthers would conduct updated conditioning based on these and the other changes agreed, for report to a meeting to be held at the same time as the September Bluefin assessment session, for review and final adoption of a conditioned Reference Set OMs. He would also update the trials specification document to take account of the decisions above for report to that same September meeting.

7) Progress on the development of a software package, incorporating all the OMs and associated trials, which allows any potential CMP developer to apply their CMP and view the results

Ton Carruthers updated the group on his progress towards developing this package. A final version of the package would be ready for presentation at the September meeting, together with an example of its usage to provide results in the form of performance statistics for at least one simple example of a CMP.

This, and all other software developed for this MSE project, will be publically available on the ICCAT website (<https://github.com/ICCAT/abft-mse/>).

8) Future plans

A future schedule was agreed whose major components, aside from those already mentioned above for report to a September meeting, were as follows:

- a) Some summary of the progress and plans above is to be presented to the 2017 Commission meeting.
- b) In about April 2018 the various developers of CMPs will meet to compare results and agree on refinements to take their CMPs further.
- c) The September 2018 Bluefin session will narrow the set of CMPs based on their performance across the various OMs.
- d) The 2018 SCRS meeting will include an associated first stakeholder-scientist interaction meeting to discuss desired MP properties and performance, informed by results from this first set of CMPs.

Note that the ultimate aim of this exercise is to table a proposed set of MP options to Commission at its 2019 meeting to allow them to make a final selection at that time.

9) Other

The results and proposals above were included in a presentation to the Bluefin assessment group meeting in parallel for their information.

Some discussions took place, proposing to incorporate also a “no-mixing” hypothesis, which is the one currently used in the assessment, at least for showing the discrepancies between the current updated knowledge on this important issue, derived mostly from the ICCAT GBYP activities, and the current assumptions. This will be further discussed in the September meeting.

**ICCAT GBYP CORE MODELLING MSE GROUP
DRAFT AGENDA FOR THE MEETING (19 to 25 July 2017)
ICCAT SECRETARIAT
Calle Corazón de Maria 8, 7a -28002 Madrid (Spain)**

19 July 2017 – 09:30

- 8) Opening of the CMMG meeting.
- 9) Nomination of the Chair.
- 10) Nomination of the rapporteur(s).
- 11) Activities to be done in agreement with the proposals set by the CMMG in March 2017 and shared with the ICCAT SCRS Bluefin Tuna Species Group (annex 1).
- 12) Consideration of report on refined conditioning of OMs, to include:
 - a) Linkage to selections/assumptions made for the 2017 bluefin assessment
 - b) Update on Trial Specifications document

- 10) Consideration of the updated conditioning itself, to include:
 - a) Whether the fits to the data provided are adequate
 - b) Whether the selection and generation of future data for the indices to be available for use by candidate management procedures (CMPs) are satisfactory
 - c) Whether the trials specified based on these OMs are sufficient
 - d) Formal and final adoption of conditioned OMs and associated trials, provided these are considered satisfactory

- 11) Progress on the development of a software package, incorporating all the OMs and associated trials, which allows any potential CMP developer to apply their CMP and view the results

- 12) Future plans
 - a) Development of examples of some simple CMPs, investigated using the package developed, for presentation at the September bluefin session, *inter alia* to contribute to the development of a progress report to the 2017 Commission meeting
 - b) Other

The two basic documents for the meeting will be provided by Tom Carruthers and they were made available for the participants.

PROPOSALS TO TAKE MSE FORWARD

The conditioning must be refined taking account of the following:

- i) Careful treatment of bias in generating future data for indices whose fits show systematic residual patterns.
- ii) Conflicting data necessitates more OMs, e.g. if two indices conflict, we need two OMs where one fits well to the first (and hence badly to the second), and *vice versa*.
- iii) Refined conditioning will be to updated indices as agreed at this meeting.
- iv) The set of indices assumed to continue to be available in the future will be reviewed and extended.

This work will be carried out by Tom Carruthers, advised by a small group appointed by the Core Modelling Group.

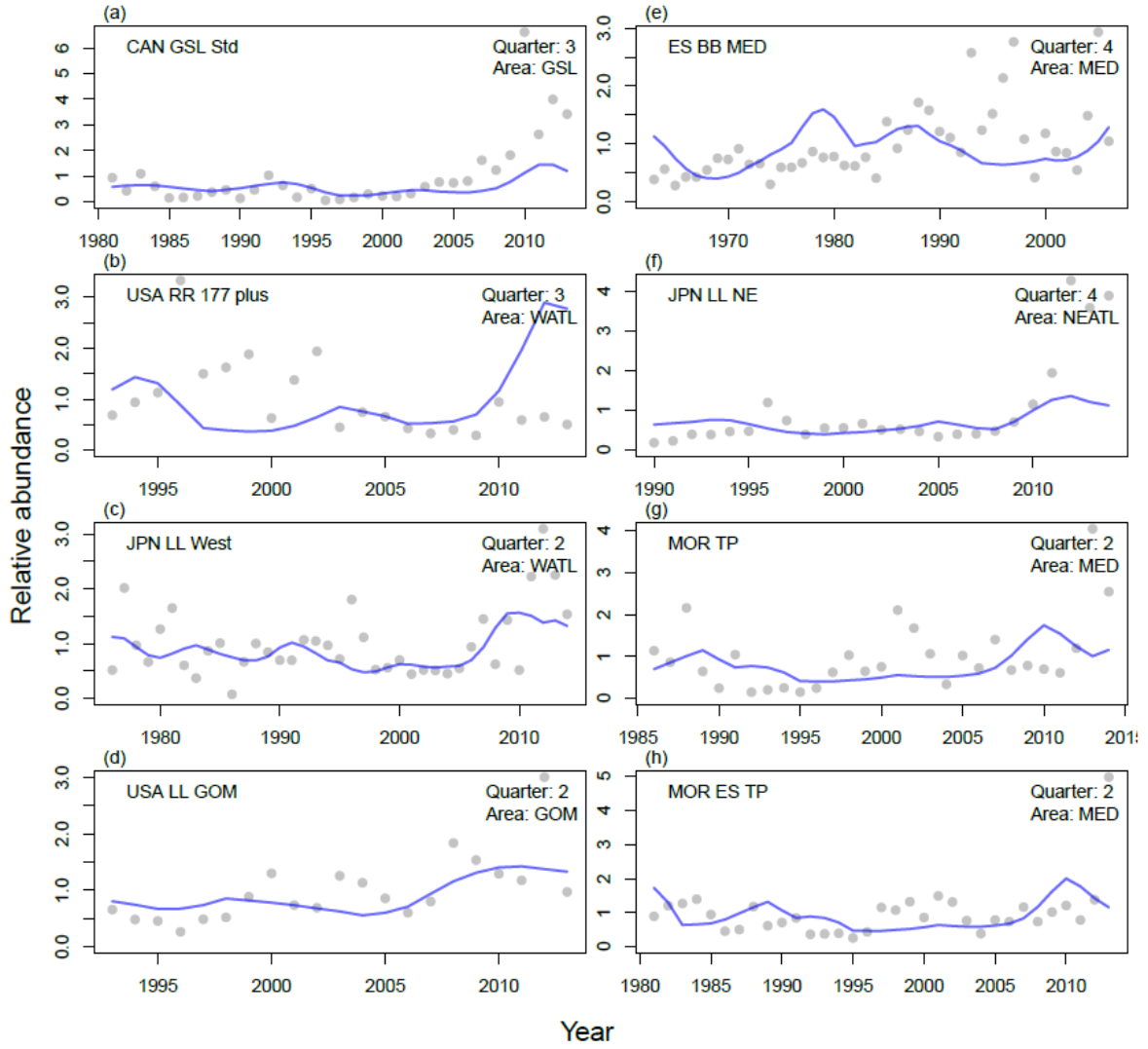
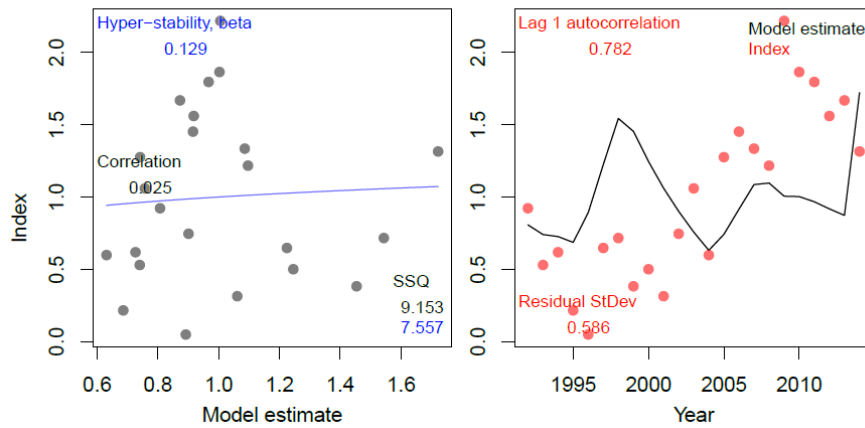


Figure 1. Assessment CPUE index fits (blue line = predicted, grey dots = index)

Index fit and statistical properties for US-CAN



FUTURE SCHEDULE PROPOSALS

- 1) The report on the refined conditioning is tabled at a meeting of the Core Modelling Group to commence the day before the July AW meeting. This meeting will review this report, and possibly ask for some amendments to be implemented during the period of the AW meeting.
- 2) The Core Modelling Group will finally adopt the conditioning during a 2-3 hour session to be organised to take place sometime during the period of the AW meeting. (Other attendees of the AW meeting may attend that session if they wish.)
- 3) Tom develops the package, incorporating all the OMs, which allows any potential MP developer to apply their MP and view the results.
- 4) Tom investigates some example MPs for the results to be tabled and considered at the September Bluefin session. The package is explained there to those present, and others are encouraged to try out their own MP options over coming months.
- 5) Some summary of the outcome from the above is presented to the 2017 Commission meeting.
- 6) About April 2018 the various developers of MPs meet to compare results and agree on refinements to take their candidate MPs further.
- 7) The September 2018 Bluefin session sees a narrowing of the set of candidate MPs based on their performance across the various OMs.
- 8) The 2018 SCRS meeting includes a first stakeholder-scientist interaction to discuss desired MP properties and performance, informed by results from this first set of candidate MPs.
- 9) The ultimate aim is to table a proposed set of MP options to Commission at its 2019 meeting.