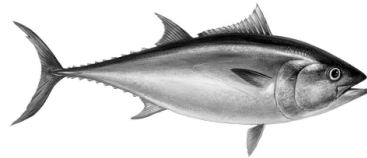
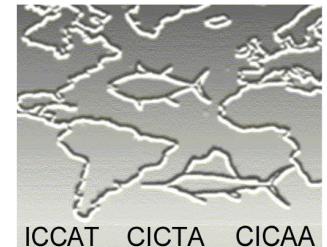
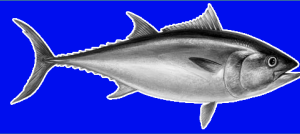


Bluefin tuna (BFT) within the framework of the new Management Strategy Evaluation (MSE) system: the exceptional circumstances



Tristan Rouyer (MARBEC, IFREMER)





The MSE in very (very/too) short

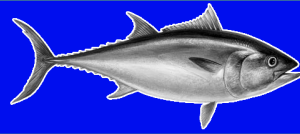
- Framework to simulate/test HCR
- Aims at complying with management objectives
- Allows to account for structural uncertainty → robustness
- Compare HCR on the basis of their relative performance, select the best performing

Adoption of the MP (BR) [Rec 22-09]

- Status: >60% to be in green kobe
- Safety: ≤15% prob to be below Blim
- Yield: maximize catches
- Stability: +20%/-35% max (+ phase-in period), minimum of 50t/1000t change

Timing of events

- TAC Applied for 3 years (2023-2025)
- In 2025, SCRS re-run MP for the 2026-2028 period
- In 2026 stock assessment/health chec

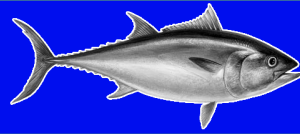


Basic concept

- The stock is in a state not plausible in the context of the MSE
 - Impossible to implement the MP (data missing)
 - Direct action: suspending/amending TAC recommendation
 - Further evaluations to assess whether it should be suspended
- MSE covered a wide range of scenarios: situations leading to cancelling the MP should be rare and extraordinary.

Timeline

- EC provision recommendations will be finalized at the September Species group meeting
- Approved by the SCRS at the Plenary
- Presented to the Commission for adoption in November



Remain close to the existing provisions for North Atlantic albacore [Rec 21-04]

- More straightforward, less work, more easily accepted by Panel 2/the Commission
- Modifications to reflect the unique aspects of the BFT MSE

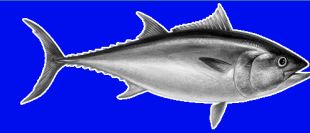
Difference in the way ECs are applied in different RFMOs

- ECs flag areas to be kept under scrutiny. No immediate action.
- Rules are rigid. if a threshold is crossed, action is taken immediately
- NALB: flexible

Tasks

- a. Define the principles of BFT EC
- b. Define the set of indicators for BFT EC
- c. Define the actions to be taken in light of BFT ECs
- d. Create flowchart of EC protocols (similar to NALB)

FLOWCHART OF ACTIONS (FROM NALB)



The SCRS shall check if ECs exist using the indicators specified in the table in Section 2 above and according to the indicated frequency.

Year 1 & 2:

1. check for new studies of growth, maturity, and natural mortality;
2. update CPUE indices;
3. update catch.

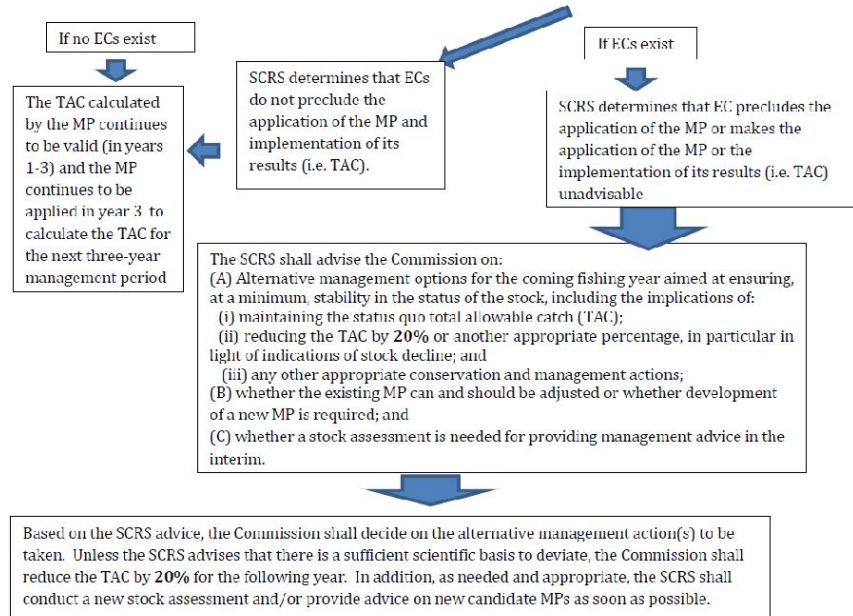
- checking that all three of these are within the range of values specified in the table in Section 2 above.

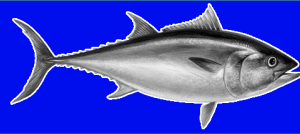
Year 3:

1. check that all datasets required in running the MP are available
2. re-run MP and check stock biomass and fishing mortality resulting from the MP's production model is within the 2.5% to 97.5% percentile range of values that occurred in the production model results when the accepted MP was tested by MSE;
3. same checks done in Year 1 & 2.

Any year:

- if a stock assessment has been conducted by the SCRS, check that the stock biomass and fishing mortality resulting from the stock assessment are within the 2.5% to 97.5% percentile range of values from the OMs used in the MSE when the accepted MP was tested.



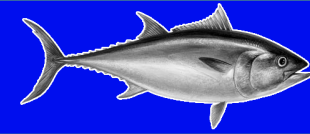


Initial considerations

1. Similar to NALB, recommend that a declaration that EC exist would not immediately trigger suspension of the MP, but would rather trigger a determination of the seriousness of the EC on the continuation of application of the MP by the SCRS.
2. If the SCRS determines that the MP should be suspended, the SCRS will advise the Commission on a course of action (e.g., amending its TAC recommendations).

Assessing the severity

- Using abundance indices as the fundamental indicator
- Joint indices as well
- Look at different kinds of scenarios



MSE simulates future trajectories of the stocks

Fundamental indicator

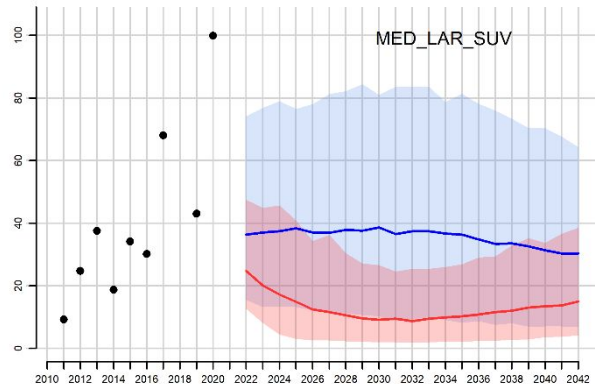
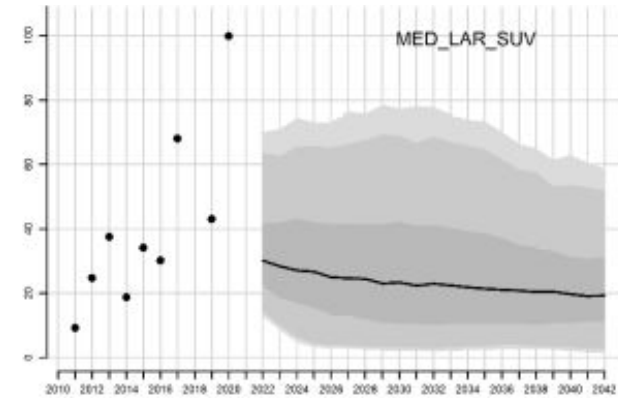
Indices (including joint index) fall outside the 2.5% and 97.5% range in projections ?

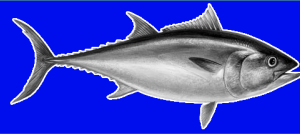
Questions

- 95% probability envelope for ABFT or different ?
- Asymmetrical envelope, easier to breach lower tail ?
- Severity of breach will guide course of action

Remarks

- Envelope allows for low index values, but dealt with by MP
- Indices projections by recruitment scenarios: could help determining what is the most likely scenario, impact in terms of risk (low productivity)

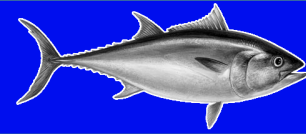




Considerations for indices

1. Similar to NALB, recommendation is to use the 95% for this prediction envelope for BFT.
2. Excursions outside of the 95% prediction envelope may constitute EC, however, the SCRS would evaluate the seriousness for such EC determination regarding the continued application of the MP.
3. The SCRS is considering options such as:
 - If two or more series (or greater than one per area) have not been updated for two or more years
 - If two or more series are determined to no longer reflect abundance

OTHER DATA TO BE CONSIDERED



Utilization of additional future scientific information

- Updated estimates to existing data: can be compared to the corresponding values predicted within the MSE. If observed values diverge this could be grounds for triggering Ecs.
- Completely new sources of information that were not considered: MSE reconditioning
- EC should be quick annual checks to ensure that continued MP advice is acceptable
- MSE reconditioning is where additional scientific information is included (timing ?)

Stock composition

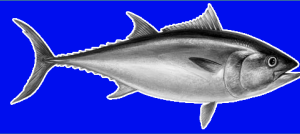
- Could be tested against empirical observations: substantial work
- Genetics data used for rates of migration (Robustness test with poor MP performance)

Absolute abundance

- Close-kin mark-recapture to test whether biomass is outside of the range (CCSBT)
- Should be considered after completion, presentation and acceptance of a study

Fishery or fishing operations have changed substantially

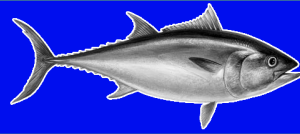
- Changes to the fishery (allocation, selectivity): little importance ?
- Wait until any allocation changes between fleets of very different selectivity are anticipated



- a. Total catch exceeds or falls short of TAC for either area by a certain percentage.
- b. Substantial changes in fishing allocations/selectivity.
- c. Population dynamics greatly diverge from OMs used in BFT's MSE for the development of the current MP.

From CCSBT: “Substantial improvements in knowledge, or new knowledge, concerning the dynamics of the population and the fisheries which would have an appreciable effect on the operating models used to test the existing MP and its performance;”

- d. Ecosystem/climatic factors. Note that these would have to be more extreme or impactful than the regime shifts modelled in the OMs.



Population dynamics greatly divergent from MSE

- CCSBT: “Substantial improvements in knowledge, or new knowledge, concerning the dynamics of the population and the fisheries which would have an appreciable effect on the operating models used to test the existing MP and its performance”
- Many candidate indicators that cannot be addressed in full
- Up to scientists to show that their updated results will be impactful for the MP
- Scientific updates (e.g., discovery of additional spawning areas or alternative stock structures) will be considered at the subsequent MSE revision.

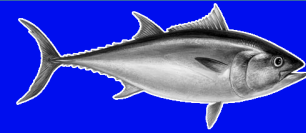
Ecosystem/climatic factors

- Have to be more extreme or impactful than the regime shifts modelled in the MSE
- Development of ecosystem indicators explored by the ecosystem subgroup (/indices)
- Such indicators could be useful if warn of potential regime shifts: could be incorporated in the MP

Robustness test explorations

- Several ROMs pose the greatest challenge to the MP
- Could be used to develop triggers for ECs

ACTIONS TO BE TAKEN WHEN EC IS TRIGGERED



It is up to the Commission to determine what action to take in response to EC breaches

NALB specifies three different actions in light of a determination of EC

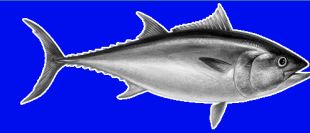
(A) alternative management options for the coming fishing year aimed at ensuring, at a minimum, stability in the status of the stock, including the implications of: (i) maintaining the status quo total allowable catch (TAC), (ii) reducing the TAC by 20% or another appropriate percentage, in particular in light of indications of stock decline, and (iii) any other appropriate conservation and management actions

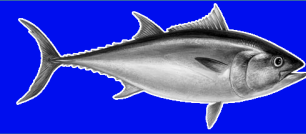
(B) whether the existing MP can and should be adjusted or whether development of a new MP is required

(C) whether a stock assessment is needed for providing management advice in the interim.

NALB example could almost be used as such

THANK YOU !





Index behaviour and performance

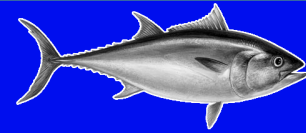
- In the case of a missing index value, the overall index is computed by disregarding that index when averaging over indices for that year only.
- If an index has more than two consecutive years of missing, ECs should be triggered.
- If any area has two missing index values in a given year, that would trigger Ecs.
- A strict index update is impossible, index not directly comparable to the envelopes
- It is up to the SCRS to gauge the severity and develop a suitable course of action

Assessment planned for 2026 or 2027 and EC

- CCSBT uses assessment for ECs: long-term changes in recruitment detected by the assessment or stock status very different than the OMs would predict
- Challenging to measure the severity of an EC using information from assessment for ABFT
- Extreme differences in stock status, overfishing or long patterns in recruitment: ECs ?

Catch overruns

- Challenging to quantify, fall under the category of IUU fishing
- Catch in excess of 5% in either area constitutes Ecs



For NALB [Rec 2021-04] three general principles should be considered for potential EC

- a. Evidence that the stock or population dynamics are different from those previously considered to be plausible in the context of the MSE
 - How new scientific information would impact ECs ?
 - Analyses necessary to investigate the additional information with respect of the MSE scenarios. If new information makes some scenarios implausible, then this may trigger Ecs.

- b. When there is evidence that the data required to apply the management procedure (MP) are not available or are no longer appropriate
 - This might be strict. along the lines of: “not sufficiently available” – with 10 indices, absence of one in a single year would not be “fatal”, for example.

- c. When there is evidence that total catch is above the TAC set using the MP
 - Quantification ?
 - Period of time ?
 - Consider catches for both stocks independently ?