17-04 **ALB**

RECOMMENDATION BY ICCAT ON A HARVEST CONTROL RULE FOR NORTH ATLANTIC ALBACORE SUPPLEMENTING THE MULTIANNUAL CONSERVATION AND MANAGEMENT PROGRAMME, REC. 16-06

RECALLING the Recommendation by ICCAT on a multi-annual conservation and management programme for North Atlantic Albacore [Rec. 16-06] and, namely, the request to the SCRS to refine the testing of candidate reference points and associated harvest control rules (HCRs) to support the management objectives for North Atlantic albacore established therein;

CONSIDERING that the 2016 Standing Committee on Research and Statistics (SCRS) stock assessment concluded that the relative abundance of North Atlantic albacore has continued to increase over the last years and is most likely located in the green area of the Kobe plot, and as a result the stock is not overfished and overfishing is not occurring;

RECOGNIZING that the simulations conducted in 2017 using Management Strategy Evaluations (MSE) allow the SCRS to provide advice that is robust to a wide range of uncertainties, including those affecting the 2016 assessment and that, although further work in reviewing and improving the MSE is advisable, none of the concerns is sufficient to preclude the interim implementation of any of the HCRs proposed by the SCRS to establish short-term 3-year constant annual TACs;

FURTHER RECALLING that the Standing Working Group to Enhance Dialogue between Fisheries Scientists and Managers (SWGSM) recommended that an external review of the North Atlantic Albacore MSE should be considered by the Commission, ideally in 2018;

ACKNOWLEDGING the SCRS work in 2017 to test, through MSE simulations, a large set of HCRs out of which, as advised by the SWGSM, a reduced number of robust HCRs was finally considered. All the selected HCRs are predicted to meet the objectives to be in the green area of the Kobe plot with a probability higher than 60%. Moreover, 96% of the Operating Models have shown biomass above B_{MSY} with at least 60% probability between 2020-2045;

NOTING that the HCRs with the highest target fishing mortalities (F_{TAR}=F_{MSY}) were associated with lower probabilities, although higher than 60%, of being in the Kobe green quadrant, higher probabilities of the stock being between B_{LIM} and B_{THRESH} with only slightly higher long-term yields;

FURTHER NOTING the desire for stability in the fishery;

CONSIDERING that the SCRS tested a minimum fishing mortality (F_{MIN}) that needs to be established in order to ensure a scientific monitoring of the status of the stock should the stock status fall below safe biological limits;

TAKING INTO ACCOUNT that if the Commission adopts an HCR then the TAC established via Rec. 16-06 shall be re-established according to the adopted HCR;

CONSIDERING that the SCRS' intention to further explore and to consolidate the MSE framework in the future is without prejudice to the interim adoption of an HCR subject to possible future advice of the SCRS;

NOTING the importance of identifying exceptional circumstances that would result in suspending or modifying the application of the HCR;

THE INTERNATIONAL COMMISSION FOR THE CONSERVATION
OF ATLANTIC TUNAS (ICCAT) RECOMMENDS THAT:

PART I
GENERAL PROVISIONS

Management objectives

1. The management objectives of the multiannual management and conservation programme for North Atlantic albacore are those set out in paragraph 2 of Rec. 16-06.

PART II
BIOLOGICAL REFERENCE POINTS AND HARVEST CONTROL RULES

2. For the purpose of the multiannual management and conservation programme for the North Atlantic albacore, the following interim reference points[1] are established:

   (a) $B_{THRESH} = B_{MSY}$

   (b) $B_{LIM} = 0.4*B_{MSY}$

   (c) $F_{TAR} = 0.8*F_{MSY}$

   (d) $F_{MIN} = 0.1*F_{MSY}$

3. The North Atlantic albacore stock assessment shall be conducted every three (3) years, with the next stock assessment to occur in 2020.

4. The harvest control rule (HCR) sets a 3-year constant annual total allowable catch (TAC) using the following three values estimated from each stock assessment. For each value the median values as reported in the summary table of the SCRS report shall be used:

   a) The estimate of current stock biomass (B_{curr}) with respect to B_{MSY}.

   b) The estimate of the stock biomass at Maximum Sustainable Yield (B_{MSY}).

   c) The estimate of the fishing mortality at MSY (F_{MSY}).

5. The HCR shall have the form shown in **Annex 1** and the following control parameters set as per below:

   a) The biomass threshold level (B_{THRESH}) is equal to the biomass able to deliver the maximum sustainable yield ($B_{THRESH} = B_{MSY}$).

   b) A fishing mortality target corresponding to 80% of F_{MSY} ($F_{TAR} = 0.8*F_{MSY}$) will be applied when the stock status is at, or above, the threshold level (B_{THRESH}).

[1] For the purposes of this Recommendation, the definitions of Harvest Control Rules and Reference Points adopted in ICCAT Recommendation 15-07 will apply.

c) If the current biomass (B_{CURR}) is estimated to be below the threshold level (B_{THRESH}) and higher than B_{LIM}, then fishing mortality will be reduced linearly for the next multiannual management period (F_{NEXT}) on the following basis:

$$\frac{F_{NEXT}}{F_{MSY}} = a + b * \frac{B_{curr}}{B_{MSY}} = -0.367 + 1.167 \frac{B_{curr}}{B_{MSY}}$$

where $a = \left[\frac{Ftar}{FMSY}\right] - \left[\frac{\frac{Ftar}{FMSY} - \frac{Fmin}{FMSY}}{\frac{Bthresh}{BMSY} - \frac{Blim}{BMSY}}\right] * \frac{Bthresh}{BMSY}$ = -0.367

$$b = \left[\frac{\frac{Ftar}{FMSY} - \frac{Fmin}{FMSY}}{\frac{Bthresh}{BMSY} - \frac{Blim}{BMSY}}\right] = 1.167$$

d) If the current biomass (B_{CURR}) is estimated to be at, or below, B_{LIM}, then the fishing mortality shall be set at F_{MIN} with a view to ensure a level of catch for scientific monitoring.

e) The Maximum catch limits (Cmax) recommended are 50,000 t to avoid adverse effects of potentially inaccurate stock assessments.

f) The maximum change in the catch limit (Dmax) shall not exceed 20% of the previous recommended catch limit when $B_{CURR} \geq B_{THRESH}$.

6. The HCR described in paragraph 5 (a-d) produces a relationship between stock status and fishing mortality as shown in the graph of **Annex 1**. The table of **Annex 2** reports the values of relative fishing mortality to be applied (F_{NEXT}/F_{MSY}) for specific values of relative biomass (B_{curr}/B_{MSY}).

PART III
CATCH LIMITS

TAC and catch limits

7. The 3-year constant annual TAC shall be set as follows:

a) if the current biomass (B_{CURR}) is estimated to be at, or above, the threshold biomass (i.e., $B_{CURR} \geq B_{MSY}$), then the catch limit shall be set at

1. $TAC = F_{TAR} * B_{curr}$

b) if the current biomass (B_{CURR}) is estimated to be below the threshold biomass (i.e., $B_{CURR} < B_{MSY}$) but greater than B_{LIM} (i.e., $B_{CURR} > 0.4*B_{MSY}$), then the catch limit shall be set at

1. $TAC = F_{NEXT} * B_{CURR}$

where a series of indicative values for F_{NEXT} are reported in the table of **Annex 2** or can be calculated through the formula reported in paragraph 5.c above.

c) if the current biomass (B_{CURR}) is estimated to be at, or below, the B_{LIM} (i.e., $B_{CURR} \leq 0.4*B_{MSY}$), then the catch limit shall be set at

1. $TAC = F_{MIN} * B_{curr}$

with a view to ensure a level of catch for scientific monitoring.

d) the catch limit resulting from the above calculations will be below the maximum catch limit (Cmax) as reported in paragraph 5e above and shall not increase or decrease by more than 20% from the previous catch limit except when $B_{CURR} < B_{THRESH}$ or unless otherwise required pursuant to an agreed management response when exceptional circumstances are determined to have occurred by the SCRS.

e) in the case of 7c, the catch limit could be set at a level lower than F_{MIN} * B_{CURR} if the SCRS considers it sufficient to ensure a level of catch proper for scientific monitoring.

8. Pursuant to paragraphs 4, 5 and 7, a 3-year constant annual TAC of 33,600 t is established for the period 2018-2020. Consistent with the TAC allocations set out in Rec. 16-06, this TAC is allocated among the CPCs as follows:

CPC	*Quota (t) for the period 2018-2020*
European Union	25,861.6
Chinese Taipei	3,926.0
United States	632.4
Venezuela	300.0

9. Provisions established by paragraph 8 above are without prejudice to the transfers stipulated by paragraph 4 of Rec. 16-06.

10. Provisions established by paragraph 8 above are without prejudice to the annual catch limit stipulated by paragraph 5 of Rec. 16-06.

11. Provisions established by paragraph 8 above are without prejudice to the derogation stipulated by paragraph 6 of Rec. 16-06.

PART IV
FINAL PROVISIONS

Review and exceptional circumstances

12. The SCRS is requested to develop in 2018 criteria for the identification of exceptional circumstances, taking into account, *inter alia*, the need for an appropriate balance between specificity versus flexibility in defining exceptional circumstances, and the appropriate level of robustness to ensure that exceptional circumstances are triggered only when necessary.

13. The Commission, through the Standing Working Group of Scientists and Managers, shall develop guidance on a range of appropriate management responses should those exceptional circumstances be found to occur.

14. If exceptional circumstances occur (such as stock trajectories out of the ranges tested by the MSE, extreme environmental regime shift, inability to update the stock status, etc.), the Commission shall review and consider possible revision of the HCR. The SCRS is requested to incorporate these exceptional circumstances in future developments of the MSE framework in order to provide further advice to the Commission.

15. The SCRS shall initiate a peer-review, in time for the 2018 Commission meeting, of the northern albacore MSE, including the operating models, management procedures, calculations of the performance indicators and code. Based on this review and potential refinement of the MSE to be described in a single consolidated report, the Commission may consider additional refinements of the interim HCR in 2018.

16. During 2018-2020, the SCRS shall continue the development of the MSE framework by conducting additional diagnostic checks, exploring additional management procedures including the carry over, and identifying the Operating Models (OMs) that might not be meeting the objectives under a certain HCR. The SCRS shall also indicate the percent of OMs that meet the management objective under each HCR. The SCRS is specifically requested to test, *inter alia*, some variants of the HCR adopted in this recommendation, such as:

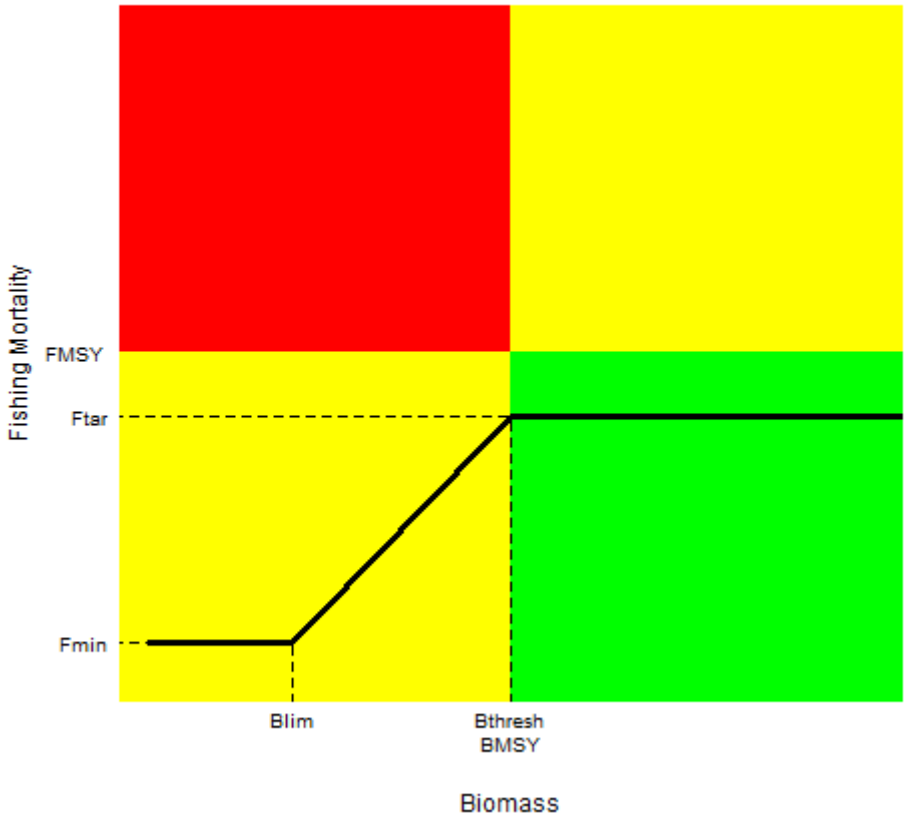
a) Setting a lower TAC limit
b) Applying the restriction of 20% maximum TAC change when the current biomass (B_{CURR}) is estimated to be below the threshold level (B_{THRESH}) and higher than B_{LIM}
c) Applying the restriction of 20% maximum TAC reduction or 25% maximum TAC increase when the current biomass (B_{CURR}) is estimated to be below the threshold level (B_{THRESH}) and higher than B_{LIM}

17. The Commission shall review the interim HCR in 2020 with a view to adopting a long-term management procedure.

18. This Recommendation amends paragraphs 3 and 4 of Rec. 16-06 and does not set a precedent for future implementation of HCRs. The Commission shall consolidate this Recommendation and Recommendation 16-06 into a single Recommendation at its 2018 Commission meeting.

Annex 1

Graphic form of the Harvest Control Rule



Annex 2

Values of relative biomass and corresponding relative fishing mortality based on a sliding linear relationship between B_{LIM} and B_{THRESH} as produced by the HCR

B_{CURR}/B_{MSY}	F_{NEXT}/F_{MSY}
1 or above	0.80
0.98	0.78
0.96	0.75
0.94	0.73
0.92	0.71
0.90	0.68
0.88	0.66
0.86	0.64
0.84	0.61
0.82	0.59
0.80	0.57
0.78	0.54
0.76	0.52
0.74	0.50
0.72	0.47
0.70	0.45
0.68	0.43
0.66	0.40
0.64	0.38
0.62	0.36
0.60	0.33
0.58	0.31
0.56	0.29
0.54	0.26
0.52	0.24
0.50	0.22
0.48	0.19
0.46	0.17
0.44	0.15
0.42	0.12
0.40	0.10