



To: ICCAT Advisory Committee
Date: 14 October 2021
From: David Schalit, President

Subject: ABTA's Position on TAC for the West Atlantic Bluefin Tuna Fishery 2022-2023

The Executive Summary for the 2021 West Atlantic bluefin tuna stock assessment does not provide us with a recommended TAC for 2022 (and 2023). Instead, in the penultimate paragraph, under the heading, "Management recommendations", the SCRS provides us with four views intended to inform the Commission in its deliberations regarding western TAC for 2022 and 2023, as below:

1. The Kobe 2 Strategy Matrix
2. An empirical approach which indicates a 4% increase in relative abundance
3. An empirical approach which indicates a 16% increase in spawning stock biomass
4. An MSE-based approach that supports a 28% increase in TAC

It is up to the Commission to understand how these four views differ. Here is a brief explanation of the four approaches and what each is saying regarding a proposed TAC.

K2SM (Table 1)

The Kobe 2 Strategy Matrix (K2SM), developed at the second joint meeting of the tuna RFMOs in 2009, resulted in an agreement to standardize the presentation of stock assessment results across all five tuna RFMOs, and should be presented in the four-quadrant, "red-yellow-green" format now known as the Kobe Plot. The Strategy Matrix is a harmonized format for RFMO science bodies to convey TAC advice. In the current assessment, K2SM indicates that a TAC of approximately 3,800 mt is appropriate.

The Commission should also consider, as further evidence supporting the results of the Kobe Plot, the "Chicken Feet" Plot (**Table 2**). This plot looks at projected total stock biomass under alternative constant catch scenarios, averaged across maturity specifications for Stock

Synthesis, the model used in the current assessment. For 2022 and 2023, this table indicates a TAC of 3,900-4,000 mt.

Empirical approach indicating a 4% p.a. increase in relative abundance

This simple methodology was proposed a few years ago. In this specific case, all the indices for the west Atlantic are used to determine the trend in abundance. This abundance is indicated to have increased recently by 4% p.a.. This methodology then indicates that the same value, 4%, is also the factor by which TAC should be increased. Therefore, under this scenario, TAC would be increased to approximately 2,450 mt.

Empirical approach which indicates a 16% p.a. increase in spawning stock biomass

This approach is the same as the previous, which indicates a 4% p.a. increase in abundance and TAC. However, in this case, only the two indices of abundance from the Gulf of Mexico are used, and this method yields a trend of 16% p.a.. Therefore, this method advocates for an increase in TAC of 16% which equates to a TAC of approximately 2,800 mt.

MSE-based approach (Table 3)

This approach uses all of 32 Operating Models developed over the last 6 years for use in a MSE on which to base future Atlantic bluefin management. It calculates a weighted median percentage yearly increase in spawning stock biomass from 2023 to 2027, under different TACs for the west area. In this procedure, the east area TAC is fixed at 36,000 mt for 2022, and then at 40,000 mt for 2023 to 2026. This approach indicates that for a TAC of 3,000 mt for 2022 and each of the following four years, the spawning stock biomass of western origin bluefin would increase by 4.4% over 2022, and continue to increase until at least 2027.

Area-based vs. Stock-based Approaches

An “Area-Based” approach has been in use in west Atlantic bluefin tuna stock assessments from the earliest stock assessments to the present. This approach, in effect, considers all catch in the west area to be western origin bluefin. The SCRS has known for many years that there is mixing of east and west origin bluefin on western fishing grounds, but they have not had the means with which to take this mixing into account in stock assessments.

The “Stock-Based” approach has been developed for use in the MSE. This approach *does* take mixing into account. This approach focuses on ensuring that the stock will continue to increase by excluding any confounding data arising from the presence of eastern migrants on western fishing grounds. From a conservation perspective in particular, this is the more responsible and appropriate approach to take.

The reviewer, commissioned by ICCAT to conduct a review of the 2021 stock assessment has this to say on the subject: *“A priori, the stock assessments of bluefin tuna in the western Atlantic are likely to be biased due to the migration of eastern stock fish into the western area”*¹

¹ Maunder, M., Draft Review of 2021 West Atlantic Bluefin Tuna Stock Assessment, Commissioned by ICCAT (2021)

Of the methods mentioned by the SCRS as alternative approaches to determine TAC, only one uses the Stock-Based approach. This is the MSE-based method which uses all 32 Operating Models developed for the MSE, takes account of the effects of a potential concurrent increase in TAC for the east area, and projects a continued increase in western origin spawning stock biomass for the next five years, initially by 4.4% from 2022 to 2023. This method supports an increase in TAC for the west area of 28%, i.e., to approximately 3,000 mt.

ABTA's Position on TAC for 2022-2023

ABTA advocates for a TAC of 3,800 mt for 2022 and 2023 based upon the results of the Kobe Plot as found in the 2021 stock assessment, which was the approach developed specifically to provide the basis for such advice.

Summary

The present stock assessment has definitively confirmed that it was badly needed, given its vastly improved results as compared with the 2020 stock assessment. Notably the SCRS report indicates no disagreement that an increase in the TAC for the west area for 2022 is justified. Our present understanding of the current status and trend of spawning stock biomass is dramatically different, indicating marked improvement as compared to the negative projections from the 2017 and 2020 assessments. Similarly, a dramatic improvement in estimates of recent recruitment has been recognized in the 2021 assessment. This, together with needed changes to selectivity, are the main elements driving the results found in the present Kobe Plot.

Table 1

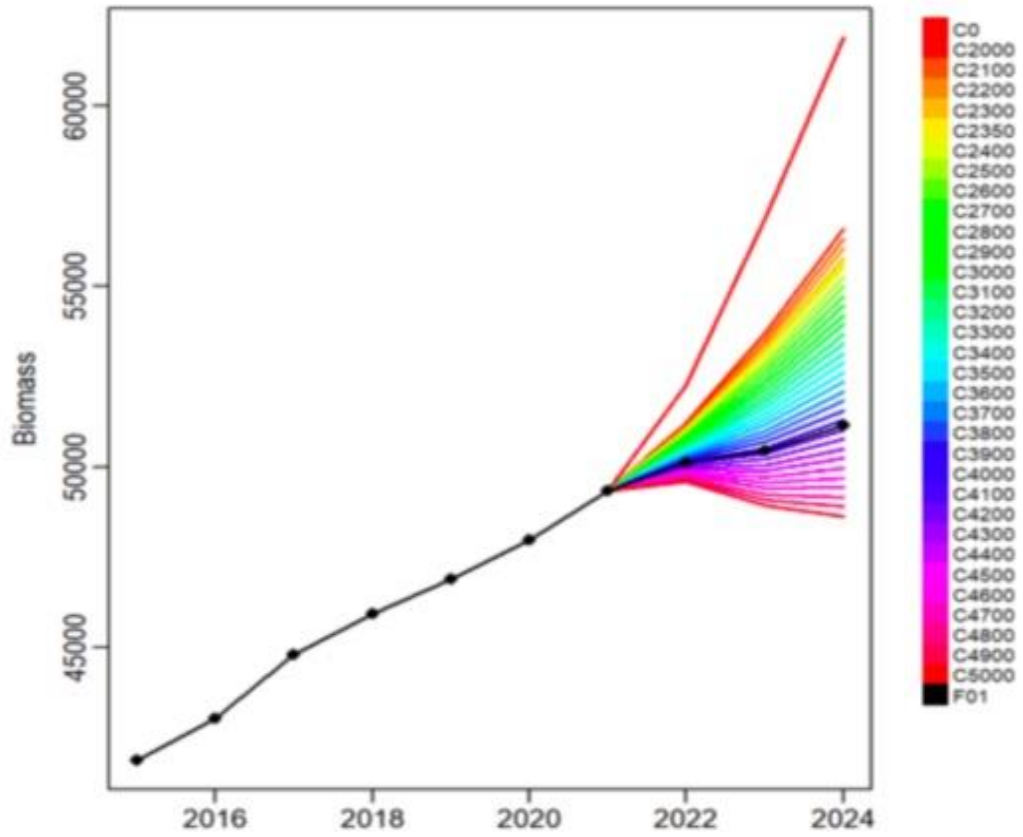
Kobe Matrix giving the probability that the fishing mortality rate (F) will be less than the F reference point (overfishing not occurring) over the next two years for alternative constant catches, based on results from the 2021 Stock Synthesis.

TAC	2022	2023
0 - 3000	100%	100%
3100	99%	99%
3200	98%	98%
3300	94%	95%
3400	91%	89%
3500	83%	81%
3600	71%	70%
3700	60%	56%
3800	45%	48%
3900	36%	34%
4000	25%	23%
4100	18%	18%
4200	11%	10%
4300	7%	6%
4400	5%	4%
4500	2%	2%
4600	1%	1%
4700	1%	1%
4800 - 5000	0%	0%

Source: SCRS, West Atlantic Bluefin Tuna Stock Assessment (2021)

Table 2

Projected total stock biomass (mt) of bluefin tuna in the West Atlantic under alternative constant catch scenarios, averaged across maturity specifications for Stock Synthesis



Source: SCRS, West Atlantic Bluefin Tuna Stock Assessment (2021)

Table 3

Weighted median (across the 32 Operating Models of the Grid when excluding the R3 scenarios) percentage yearly increase in western spawning stock biomass from 2023 to 2027, under a series of fixed west area TACs from 2022 to 2026. The east area TAC is fixed at 36,000 mt for 2022 and then at 40,000 mt for 2023 to 2026.

2022 TAC	Weighted median % yearly increase in SSB				
	2022 to 2023	2023 to 2024	2024 to 2025	2025 to 2026	2026 to 2027
2000	4.8%	3.6%	2.3%	1.6%	1.2%
3000	4.4%	2.8%	2.0%	0.7%	0.0%
4000	4.0%	2.0%	0.0%	-0.7%	-1.6%

Source: Rademeyer, R. and Butterworth, D., Projections of Western Atlantic Spawning Stock Biomass Under Different Catches from the West Area Commencing In 2022 based on the MSE OM Grid, (2021)