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Global Standard for Responsible Supply
of Marine Ingredients

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Global Standard for Responsible Supply of Marine Ingredients Fishery Assessment Methodology and Template Report V2.0



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Fishery Under Assessment	Skipjack Tuna Atlantic Eastern Central, Southeast
Date	March 2020
Report Code	2020-251
Assessor	Jim Daly
Stock Pass	FAO 34, 47 Atlantic Eastern Central, Southeast
Stock Fail	

Application details and summary of the assessment outcome				
Name: Marine Biotechnology Limited Ivory Coast				
Address: Abidjan				
Country: Ivory Coast		Zip:		
Tel. No.:		Fax. No.:		
Email address:		Applicant Code:		
Key Contact:		Title:		
Certification Body Details				
Name of Certification Body:		SAI Global Ltd		
Assessor	Peer Reviewer	Assessment Days	Initial/Surveillance/ Re-approval	Whole fish/ By-product
Jim Daly	Conor Donnelly	0.5	Initial	By-product
Assessment Period	2020			

Scope Details	
Management Authority (Country/State)	ICCAT
Main Species	Skipjack tuna (<i>Katsuwonus pelamis</i>)
Stock:	FAO 34, 47
Fishery Location	Atlantic Eastern Central, Southeast
Gear Type(s)	Longline, pole-lines, purse seine
Outcome of Assessment	
Peer Review Evaluation	AGREE
Recommendation	APPROVE

Assessment Determination

If any species is categorised as Endangered or Critically Endangered on IUCN's Red List, or if it appears in the CITES appendices, it cannot be approved for use as IFFO RS raw material. Skipjack tuna does not appear as Endangered or Critically Endangered on IUCN's Red List, nor does it appear in CITES appendices; therefore, Skipjack tuna is eligible for approval for use as IFFO RS by-product raw material.

The Committee has decided to maintain a working hypothesis which favours two different units of eastern and western stocks. One stock forms part of this assessment:

- 1) FAO 34, 47 Atlantic Eastern Central, Southeast.

A Stock assessment was undertaken in 2014. A 2018 report covers the most recent information on the state of the stock. Two surplus biomass production models: a model based only on catch and a mortality estimation model based on average sizes of fish captured were used. The Committee was not in a position to provide a reliable estimate of maximum sustainable yield (MSY) and therefore not provide advice on the state of the eastern stock. As no reference points are available the stock fails Clause C1.2.

According to IFFO RS procedures a stock that does not meet the minimum requirements of a Category C assessment (Clauses C1.1; C1.2) should be re-assessed as Category D.

In order to be approved, the stock assessed must pass the Category D assessment, which it does.

- 1) Skipjack tuna is **APPROVED** by SAI Global assessors in the assessment area for the production of fishmeal and fish oil under the current IFFO RS v 2.0 by-products standard.

Peer Review Comments

Notes for On-site Auditor

HOW TO COMPLETE THIS ASSESSMENT REPORT

By-products

The process for completing the template for **by-product raw material** is as follows:

1. ALL ASSESSMENTS: Complete the Species Characterisation table with the names of the by-product species and stocks under assessment. The '% landings' column can be left empty; all by-products are considered as Category C and D.
2. IF THERE ARE CATEGORY C BYPRODUCTS UNDER ASSESSMENT: Complete clause C1 for **each** Category C by-product.
3. IF THERE ARE CATEGORY D BYPRODUCTS UNDER ASSESSMENT: Complete Section D.
4. ALL OTHER SECTIONS CAN BE DELETED. Clauses M1 - M3, F1 - F3, and Sections A and B do not need to be completed for a by-product assessment.

By-product approval is awarded on a species-by-species basis. Each by-product species scoring a pass under the appropriate section may be approved against the IFFO RS Standard.

SPECIES CATEGORISATION

The following table should be completed as fully as the available information permits. Any species representing more than 0.1% of the annual catch should be listed, along with an estimate of the proportion of the catch each species represents. The species should then be divided into Type 1 and Type 2 as follows:

- **Type 1 Species** can be considered the ‘target’ or ‘main’ species in the fishery. They make up the bulk of annual landings and are subjected to a detailed assessment.
- **Type 2 Species** can be considered the ‘bycatch’ or ‘minor’ species in the fishery. They make up a small proportion of the annual landings and are subjected to relatively high-level assessment.

Type 1 Species must represent 95% of the total annual catch. Type 2 Species may represent a maximum of 5% of the annual catch (see Appendix B).

Species which make up less than 0.1% of landings do not need to be listed (NOTE: ETP species are considered separately). The table should be extended if more space is needed. Discarded species should be included when known.

The ‘stock’ column should be used to differentiate when there are multiple biological or management stocks of one species captured by the fishery. The ‘management’ column should be used to indicate whether there is an adequate management regime specifically aimed at the individual species/stock. In some cases, it will be immediately clear whether there is a species-specific management regime in place (for example, if there is an annual TAC). In less clear circumstances, the rule of thumb should be that if the species meets the minimum requirements of clauses A1-A4, an adequate species-specific management regime is in place.

NOTE: If any species is categorised as Endangered or Critically Endangered on the IUCN Red List, or if it appears in the CITES appendices, it **cannot** be approved for use as an IFFO RS raw material. This applied to whole fish as well as by-products.

TYPE 1 SPECIES (Representing 95% of the catch or more)

Category A: Species-specific management regime in place.

Category B: No species-specific management regime in place.

TYPE 2 SPECIES (Representing 5% OF THE CATCH OR LESS)

Category C: Species-specific management regime in place.

Category D: No species-specific management regime in place.

Common name	Latin name	Stock	% of landings	Management	Category
Skipjack tuna	<i>Katsuwonus pelamis</i>	N/A	N/A	ICCAT	C, D

CATEGORY C SPECIES

In a whole fish assessment, Category C species are those which make up less than 5% of landings, but which are subject to a species-specific management regime. In most cases this will be because they are a commercial target in a fishery other than the one under assessment. In a by-product assessment, Category C species are those which are subject to a species-specific management regime and are usually targeted species in fisheries for human consumption.

Clause C1 should be completed for **each** Category C species. If there are no Category C species in the fishery under assessment, this section can be deleted. A Category C species does not meet the minimum requirements of clause C1 should be re-assessed as a Category D species.

Species Name		Skipjack tuna <i>Katsuwonus pelamis</i>	
C1	Category C Stock Status - Minimum Requirements		
	C1.1	Fishery removals of the species in the fishery under assessment are included in the stock assessment process OR are considered by scientific authorities to be negligible.	PASS
	C1.2	The species is considered, in its most recent stock assessment, to have a biomass above the limit reference point (or proxy), OR removals by the fishery under assessment are considered by scientific authorities to be negligible.	FAIL
Clause outcome:			FAIL

C1.1

Evidence

This assessment covers Skipjack tuna harvested from the area outlined in **Figure 1**:

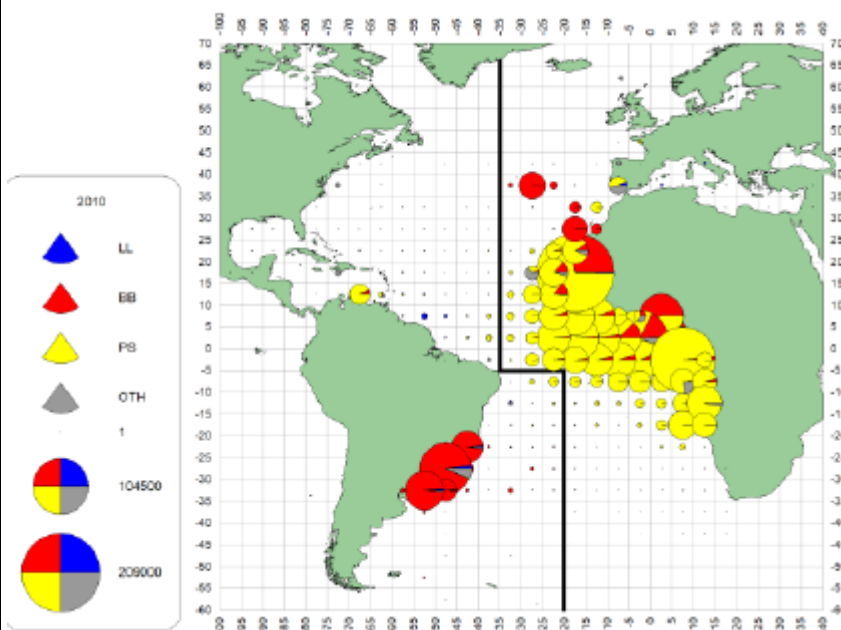


Figure 1: Geographical distribution of the skipjack catch by major gears (2010-17). **R1**

Total catches of skipjack throughout the Atlantic Ocean (including catches of faux poissons (un-reported skipjack) landed in Côte d' Ivoire) remain high, reaching 305,300 t in 2018 (there still remains an estimate 4.2% non-reported catch, for which in general the average of the last three years has been assumed).

Preliminary estimates of catches made in 2018 in the East Atlantic amounted to 282,427t, an increase of about 85% as compared to the average of 2005-2009 (**Figure 2**):

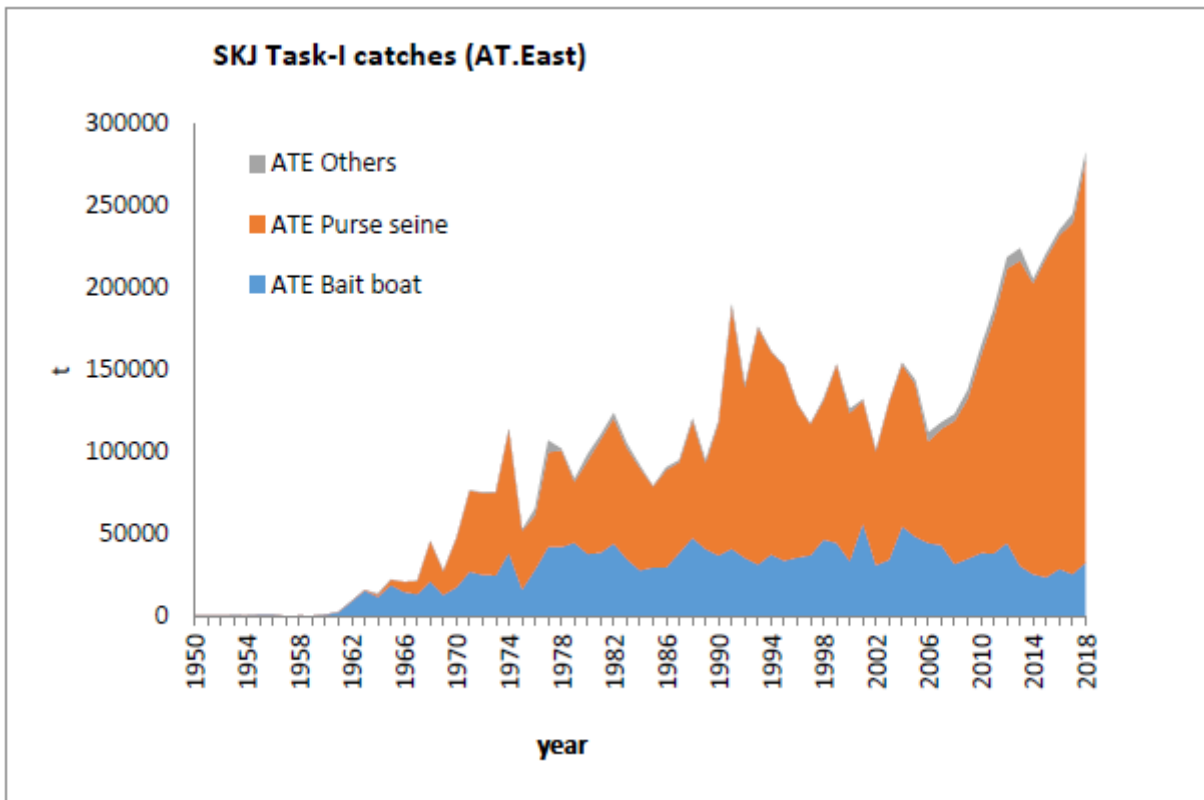


Figure 2: Skipjack catches in the eastern Atlantic, by gear (1950-2018) **R1**

Several assessment methods, conventional and non-conventional (based solely on catches, or on development of average size) have been applied to the Eastern Atlantic skipjack stock. Several fishery indicators have also been analysed in order to track the development of the state of the stock over time.

The Committee has analysed two standardized fishery indices from the EU-purse seine fishery: an index which accounts for skipjack caught in free schools off the coast of Senegal up to 2006 and the second index which characterizes fish captured off FOBs (Fish Aggregation Devices) and in free schools in the equatorial area.

C1.2

Evidence

There is no evidence of a fall in yield, or in the average weight of individuals captured. Estimated value of MSY, according to the catch-only assessment model, has tended to increase in recent years but at a growth rate lower than that observed for the catches for the same period. According to this model, although it is unlikely that the eastern skipjack stock is overexploited, current catches could be at, even above, the MSY:

The Committee recommends improvements in the estimation of faux poissons that is mainly composed of skipjack so that the uncertainty of the total skipjack catches is reduced:

Table 1 Atlantic Skipjack (Eastern Stock) Summary Table **R1**

	East Atlantic
Maximum Sustainable Yield (MSY)	
Current yield (2018 ¹)	282,427 t
Current Replacement Yield	Unknown
Relative Biomass (B_{2013}/B_{MSY})	Likely >1
Mortality due to fishing (F_{2013}/F_{MSY})	Likely <1
Stock Status	
Overfished:	Not likely
Overfishing:	Not likely
Management measures in force	Rec. 16-01

¹ Reports of catches for 2018 should be considered provisional.

Regardless of the model used: 2 surplus biomass production models (one non-equilibrium conventional model, and one Bayesian model), a model based only on catch and a mortality estimation model based on the average sizes of fish captured, the Committee was not in a position to provide a reliable estimate of the maximum sustainable yield and therefore nor provide advice on the state of the eastern stock.

According to IFFO RS procedures a stock that does not meet the minimum requirements of a Category C assessment (Clauses C1.1; C1.2) should be re-assessed as Category D.

References

R1 ICCAT Stock Assessments and Executive Summaries: Skipjack tuna

https://iccat.int/Documents/SCRS/ExecSum/SKJ_ENG.pdf

R2 Fishbase: Skipjack tuna:

<https://www.fishbase.in/Summary/SpeciesSummary.php?ID=107&AT=skipjack>

Standard clauses 1.3.2.2

D1	Species Name:	Skipjack tuna <i>Katsuwonus pelamis</i>	
	Productivity Attribute	Value	Score
	Average age at maturity (years)	1.3	1
	Average maximum age (years)	12	2
	Fecundity (eggs/spawning) *	400,000	1
	Average maximum size (cm)	110	2
	Average size at maturity (cm)	40	2
	Reproductive strategy	Broadcast	1
	Mean trophic level	4.4	3
	Average Productivity Score		1.71
	Susceptibility Attribute	Value	Score
	Overlap of adult species range with fishery	<25%	1
	Distribution	Not used	-
	Habitat	Not used	-
	Depth range	0-260m	3
	Selectivity	Up to 4m in length	3
	Post-capture mortality	Short tows	2
	Average Susceptibility Score		2.25
	PSA Risk Rating (From Table D3)		PASS

Evidence:

*** Life history tool**

This assessment covers Skipjack tuna harvested from the area outlined in **Figure 1**.

Skipjack tuna has a global distribution (**Figure 2**):

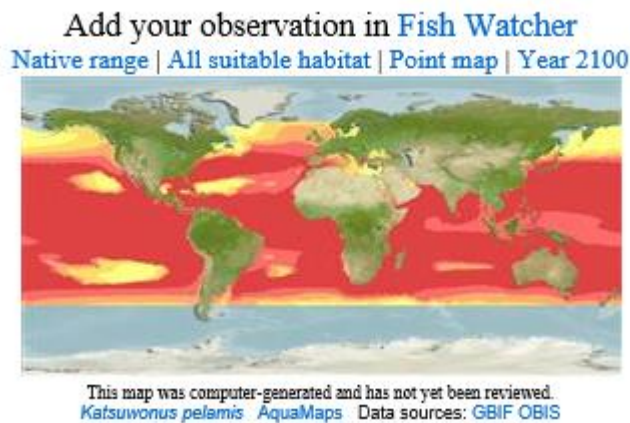


Figure 2: Skipjack tuna global distribution **R2**

Family:	Scombridae Mackerels, tunas, bonitos	
Max. length (Lmax):	<input type="text" value="110.0"/> cm FL	
L infinity (Linf):	= <input type="text" value="90.0"/> cm <input type="text" value="TL"/> <input type="button" value="Recalculate"/>	
K:	<input type="text" value="0.49"/> /year \emptyset' = <input type="text" value="3.60"/> Median \emptyset' value with related Linf. and K.	<input type="button" value="Recalculate"/> Growth & mortality data
to:	<input type="text" value="-0.25"/> years Estimated from Linf and K.	
Natural mortality (M):	<input type="text" value="0.83"/> s.e. <input type="text" value="0.55"/> - <input type="text" value="1.25"/> /year Estimated from Linf., K and annual mean temp. = <input type="text" value="29.5"/> °C	<input type="button" value="Recalculate"/>
Life span (approx.):	<input type="text" value="5.9"/> years Estimated from Linf., K and to. Max. age & size data	
Generation time:	<input type="text" value="1.9"/> years Estimated from Lopt, Linf., K and to.	
Age at first maturity (tm):	<input type="text" value="1.3"/> years Estimated from Lm, Linf., K and to.	
L maturity (Lm):	<input type="text" value="47.5"/> s.e. <input type="text" value="35.5"/> - <input type="text" value="63.7"/> cm <input type="text" value="TL"/> Estimated from Linf. Maturity data	
L max. yield (Lopt):	<input type="text" value="57.9"/> s.e. <input type="text" value="48.9"/> - <input type="text" value="68.4"/> cm <input type="text" value="TL"/> Estimated from Linf.	
Length-weight:	<input type="text" value="90.0"/> cm <input type="text" value="FL"/> <input type="button" value="=>"/> <input type="text" value="17682.8 g"/> (wet weight) W = <input type="text" value="0.0077"/> * L ^ <input type="text" value="3.25500"/>	<input type="button" value="Recalculate"/> Length-weight data
Nitrogen & protein:	Weight <input type="text" value="17683"/> (g) => whole-body nitrogen (N) <input type="text" value="530.9"/> (g) => whole-body crude protein <input type="text" value="3317.8"/> (g)	<input type="button" value="Recalculate"/>
Reproductive guild:	nonguarders: open water/substratum egg scatterers Reproduction	
Fecundity:	<input type="text" value="400,000"/> [<input type="text" value="80,000-2,000,000"/>] Estimated as geometric mean. Fecundity	
Relative Yield per Recruit (Y'/R):	<input type="text" value="0.0368"/> Estimate Y'/R from M/K, Lc/Linf and E. Lc = <input type="text" value="36.0"/> cm <input type="text" value="TL"/> E = <input type="text" value="0.50"/> /year Emsy <input type="text" value="0.62"/> /year Eopt <input type="text" value="0.56"/> /year Fmsy <input type="text" value="1.35"/> /year Fopt <input type="text" value="1.06"/> /year	<input type="button" value="Recalculate"/>
Exploitation:	Z = <input type="text"/> F = <input type="text"/> E = <input type="text"/> Estimate Z, F, E from Lc, Lmean, Linf, K, M Lc = <input type="text" value="36.0"/> cm <input type="text" value="TL"/> Lmean = <input type="text"/> cm <input type="text" value="TL"/>	<input type="button" value="Recalculate"/>
Resilience / productivity:	<input type="text" value="High; decline threshold 0.99"/> Vulnerable to extinction if decline in biomass or numbers exceeds threshold over the longer of 10 years or 3 generations.	

Figure 3: Skipjack tuna Life history tool R2

Table D2 - Productivity / Susceptibility attributes and scores.

Productivity attributes	Low productivity/ High risk	Medium productivity/ Medium risk	High productivity/ Low risk
	Score 3	Score 2	Score 1
Average age at maturity (years)	>4	2 to 4	<2
Average maximum age (years)	>30	10 to 30	<10
Fecundity (eggs/spawning)	<1 000	1 000 to 10 000	>10 000
Average maximum size (cm)	>150	60 to 150	<60
Average size at maturity (cm)	>150	30 to 150	<30
Reproductive strategy	Live bearer, mouth brooder or significant parental investment	Demersal spawner "berried"	Broadcast spawner
Mean trophic level	>3.25	2.5–3.25	<2.5

Susceptibility attributes		High susceptibility/ High risk	Medium susceptibility/ Medium risk	Low susceptibility/ Low risk
		Score 3	Score 2	Score 1
Availability	1) Overlap of adult species range with fishery	>50% of stock occurs in the area fished	Between 25% and 50% of the stock occurs in the area fished	<25% of stock occurs in the area fished
	2) Distribution	Only in the country/ fishery	Limited range in the region	Throughout region/ global distribution
Encounterability	1) Habitat	Habitat preference of species make it highly likely to encounter trawl gear (e.g. demersal, muddy/sandy bottom)	Habitat preference of species make it moderately likely to encounter trawl gear (e.g. rocky bottom/reefs)	Depth or distribution of species make it unlikely to encounter trawl gear (e.g. epi-pelagic or meso-pelagic)
	2) Depth range	High overlap with trawl fishing gear (20 to 60 m depth)	Medium overlap with trawl fishing gear (10 to 20 m depth)	Low overlap with trawl fishing gear (0 to 10 m, >70 m depth)
Selectivity		Species >2 times mesh size or up to 4 m length	Species 1 to 2 times mesh size or 4 to 5 m length	Species <mesh size or >5 m length
Post capture mortality		Most dead or retained Trawl tow >3 hours	Alive after net hauled Trawl tow 0.5 to 3 hours	Released alive Trawl tow <0.5 hours

Note: Availability 2 is only used when there is no information for Availability 1; the most conservative score between Encounterability 1 and 2 is used.

D3		Average Susceptibility Score		
		1.00 – 1.75	1.76 – 2.24	2.25 – 3.00
Average Productivity Score	1.00 – 1.75	PASS	PASS	PASS
	1.76 – 2.24	PASS	PASS	TABLE D4
	2.25 – 3.00	PASS	TABLE D4	TABLE D4