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Global Standard for Responsible Supply of Marine Ingredients

Fishery Assessment Methodology and Template Report V2.0

Fishery Under Assessment	**Skipjack tuna *Katsuwonus pelamis* FAO 77**
Date	**May 2019**
Assessor	**Jim Daly**

Application details and summary of the assessment outcome				
Name: Thein Quynh Ltd				
Address:				
Country: Vietnam		**Zip:**		
Tel. No.:		**Fax. No.:**		
Email address:		**Applicant Code**		
Key Contact:		**Title:**		
Certification Body Details				
Name of Certification Body:		**SAI Global Ltd**		
Assessor Name	**Peer Reviewer**	**Assessment Days**	**Initial/Surveillance/Re-approval**	**Whole fish/ By-product**
Jim Daly	Virginia Polonio	0.5	SURV 1	By-product
Assessment Period	2018			

Scope Details	
Management Authority (Country/State)	Inter-American Tropical Tuna Commission (IATTC)
Main Species	Skipjack tuna *Katsuwonus pelamis*
Fishery Location	FAO 77 Pacific, Eastern Central (EPO)
Gear Type(s)	Purse seine, pole and line, long line
Outcome of Assessment	
Overall Outcome	Pass
Clauses Failed	None
Peer Review Evaluation	Agree with the final result.
Recommendation	PASS

Assessment Determination
Eastern Pacific Ocean (EPO) stock of skipjack tuna are managed by the Inter-American Tropical Tuna Commission (IATTC) The Commission co-ordinate scientific research and stock assessment of species within its remit. Fisheries Status Reports, published annually, give an account of assessments undertaken for tunas and billfishes in the assessment area. Indicators and reference levels have been used to evaluate the status of this stock. Data- and model-based indicators have yet to detect any adverse impacts of the fishery. A conventional assessment of skipjack is necessary to ascertain stock status but, as noted in this report, this is not possible without more extensive tagging data. Implementing the large-scale tagging program in the EPO proposed in IATTC's Strategic Science Plan for 2019-2023 is therefore critical. Neither analyses of tagging data, nor various previous models (length-structured, A-SCALA, and SEAPODYM) indicate a credible risk to skipjack stock(s) in the assessment area. The stock is subject to a species-specific management regime and was assessed under Clause C. As fishery removals of EPO skipjack tuna are included in the stock assessment process and the stock can be considered, in its most recent assessment, to have a biomass above its proxy limit reference point it passes clause C. Skipjack tuna is categorised as of least concern on IUCN's Red List of Threatened Species and is not listed on CITES appendices of endangered species (websites accessed 07.05.19). Skipjack tuna in the EPO are recommended for approval as by-product under the IFFO RS Standard**.**
Peer Review Comments
Notes for On-site Auditor

Species-Specific Results

Category	Species	% landings	Outcome (Pass/Fail)	
Category A			A1	
			A2	
			A3	
			A4	
Category B				
Category C	Skipjack tuna *Katsuwonus pelamis*	N/A	Pass	
Category D				

[List all Category A and B species. List approximate total %age of landings which are Category C and D species; these do not need to be individually named here]

HOW TO COMPLETE THIS ASSESSMENT REPORT

This assessment template uses a modular approach to assessing fisheries against the IFFO RS standard.

Whole Fish

The process for completing the template for a **whole fish** assessment is as follows:

1. ALL ASSESSMENTS: Complete the Species Characterisation table, to determine which categories of species are present in the fishery.
2. ALL ASSESSMENTS: Complete clauses M1, M2, M3: Management.
3. IF THERE ARE CATEGORY A SPECIES IN THE FISHERY: Complete clauses A1, A2, A3, A4 for **each** Category A species.
4. IF THERE ARE CATEGORY B SPECIES IN THE FISHERY: Complete the Section B risk assessment for **each** Category B species.
5. IF THERE ARE CATEGORY C SPECIES IN THE FISHERY: Complete clause C1 for **each** Category C species.
6. IF THERE ARE CATEGORY D SPECIES IN THE FISHERY: Complete Section D.
7. ALL ASSESSMENTS: Complete clauses F1, F2, F3: Further Impacts.

A fishery must score a pass in **all applicable clauses** before approval may be recommended. To achieve a pass in a clause, the fishery/species must meet **all** of the minimum requirements.

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	*Katsuwonus pelamis*	EPO	N/A	IATTC	C

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 *Katsuwonus pelamis***	
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.	Pass
		Clause outcome:	**Pass**

Evidence C1.1-C1.2:

Biomass, recruitment, and fishing mortality are estimated to be highly variable over time. However estimates differ among the alternative assessment methods and are uncertain because:

- It is unknown if catch-per-day-fished for purse-seine fisheries is proportional to abundance;
- It is possible that there is a population of large skipjack that are invulnerable to the fisheries;
- The structure of the EPO stock in relation to Western and Central Pacific stocks is uncertain.

Indicators and reference levels have been used to evaluate the status of the stock (**Figure 1**). Data- and model-based indicators have yet to detect any adverse impacts of the fishery. A conventional assessment of skipjack is necessary to ascertain the status of the stock, but this is not possible without much more extensive tagging data. Implementing the large-scale tagging program in the EPO proposed in IATTC's Strategic Science Plan for 2019-2023 is critical.

Maunder (2018) provides a concise but comprehensive explanation of the difficulties associated with assessing stock status of EPO skipjack tuna. Maunder investigated some simple indicators of stock status based on relative quantities. Rather than using reference points based on MSY, they compared current values of indicators to the distribution of indicators observed historically. Maunder also developed a simple stock assessment model to generate indicators for biomass, recruitment, and exploitation rate. To evaluate current values of the indicators in comparison to historical values, reference levels based on the 5th and 95th percentiles (represented in **Figure 1** by horizontal lines) are used, as distributions of indicators are asymmetric.

Conclusions:

Maunder (2018) notes that the main concern with the skipjack stock was the constantly increasing exploitation rate. However, he notes that this appears to have levelled off in recent years; data- and model-based indicators have yet to detect any adverse consequence of this increase. Maunder also notes that the average skipjack weight was below its lower reference level in 2015 and 2016, which can be a consequence of overexploitation, but can also be caused by recent recruitments being greater than past recruitments or an expansion of the fishery into areas occupied by smaller skipjack **Figure 1.**

Any continued decline in average length is a concern and, combined with levelling off of catch and CPUE, may indicate that the exploitation rate is approaching, or above, the level associated with MSY. Neither analyses of tagging data, nor various previous models (length-structured, A-SCALA, and SEAPODYM) indicate a credible risk to skipjack stock(s).

Maunder also notes that productivity and susceptibility analysis (PSA; IATTC Fishery Status Report No 12, Figure L-4 **R4**) shows that skipjack has substantially higher productivity than bigeye tuna. Biomass (B) and the fishing mortality that produces MSY (F_{MSY}) are, respectively, negatively and positively correlated with productivity. Therefore, since skipjack and bigeye have about the same susceptibility, and susceptibility is related to fishing mortality, the status of skipjack can be inferred from the status of bigeye. The current assessment of bigeye estimates that the fishing mortality is less than F_{MSY}; therefore, the fishing mortality for skipjack should also be less than F_{MSY}. Since effort and skipjack biomass have been relatively constant over the past 10 years, this also implies that skipjack biomass is above the level that would produce MSY (B_{MSY}).

As fishery removals of EPO skipjack tuna are included in the stock assessment process and the stock can be considered, in its most recent assessment, to have a biomass above its proxy limit reference point it passes clause C.

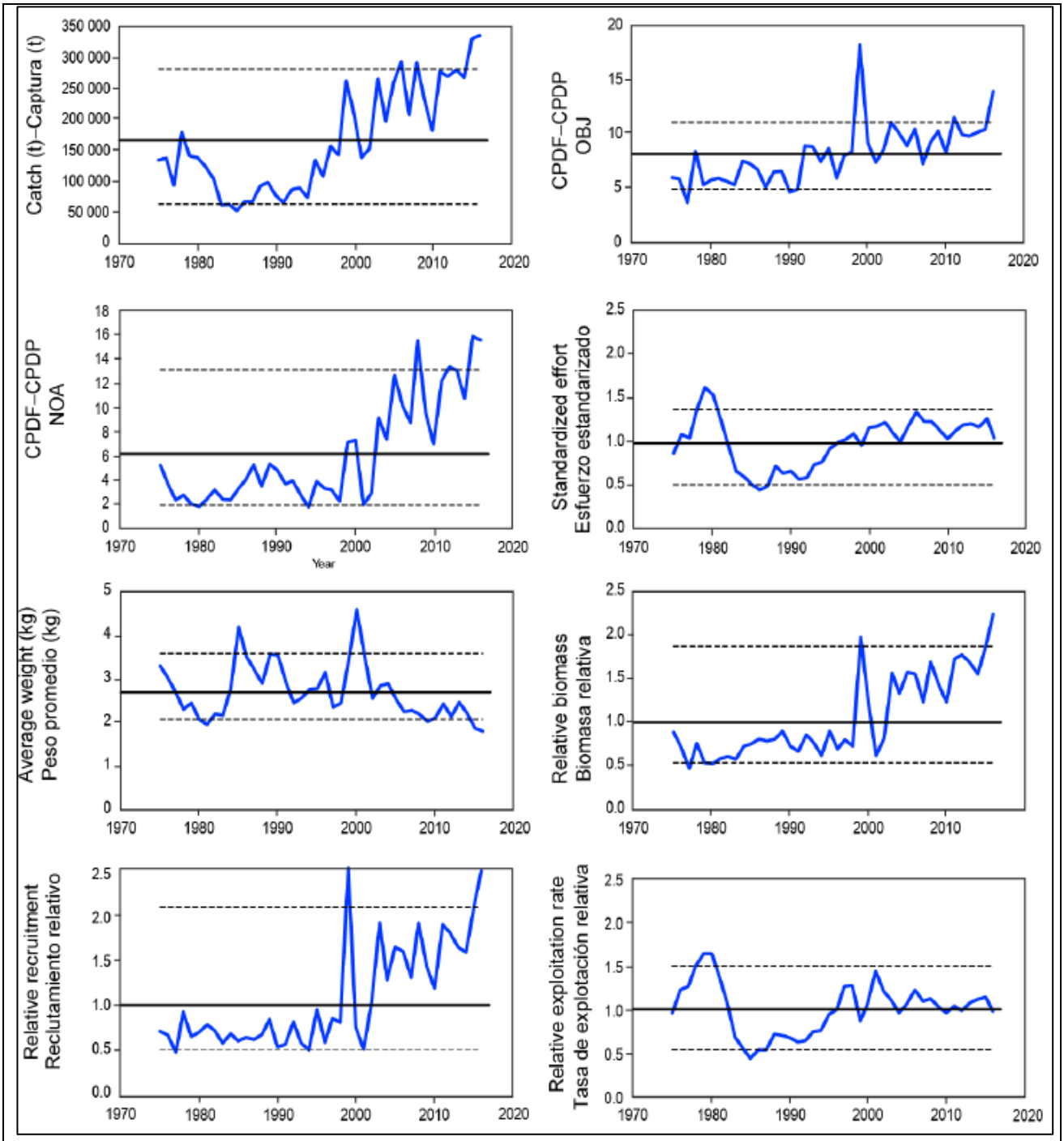

Figure 1. Indicators of stock status for skipjack tuna in the eastern Pacific Ocean. OBJ: floating-object fishery; NOA: un-associated fishery; CPDF: catch per day fished. All indicators are scaled so that their average equals one. Source: Maunder, 2016. **R2**

References

R1 IATTC, 2017. Fishery Status Report. Tunas, billfishes and other pelagic species in the Eastern Pacific Ocean in 2016. http://www.iattc.org/PDFFiles/FisheryStatusReports/_English/No-15-2017_Tunas,%20billfishes%20and%20other%20pelagic%20species%20in%20the%20eastern%20Pacific%20Ocean%20in%202016.pdf

R2 Maunder, M (2018) Stock Assessment Report 18 Status of Skipjack tuna in the Eastern Pacific Ocean 2016 pp35-42 http://www.iattc.org/PDFFiles/StockAssessmentReports/_English/No-18-2018_Status%20of%20the%20tuna%20and%20billfish%20stocks%20in%202016.pdf

R3 IATTC, 2018. Fishery Status Report. Tunas, billfishes and other pelagic species in the Eastern Pacific Ocean in 2017 http://www.iattc.org/PDFFiles/FisheryStatusReports/_English/No-16-2018_Tunas%20billfishes%20and%20other%20pelagic%20species%20in%20the%20eastern%20Pacific%20Ocean%20in%202017.pdf

R4 IATTC, Fishery Status Report No 12 Tunas and billfishes in the Eastern Pacific Ocean 2012: http://www.iattc.org/PDFFiles/FisheryStatusReports/_English/No-12-2014_Tunas%20and%20billfishes%20in%20the%20eastern%20Pacific%20Ocean%20in%202013.pdf

Standard clauses 1.3.2.2

SOCIAL CRITERION

In addition to the scored criteria listed above, applicants must commit to ensuring that vessels operating in the fishery adhere to internationally recognised guidance on human rights. They must also commit to ensuring there is no use of enforced or unpaid labour in the fleet(s) operating upon the resource.

Appendix A - Determining Resilience Ratings

The assessment of Category B species described in this assessment report template utilises a resilience rating system suggested by the American Fisheries Society. This approach was chosen because it is also used by FishBase, and so the resilience ratings for many thousands of species are freely available online. As described by FishBase, the following is the process used to arrive at the resilience ratings:

"*The American Fisheries Society (AFS) has suggested values for several biological parameters that allow classification of a fish population or species into categories of high, medium, low and very low resilience or productivity (Musick 1999). If no reliable estimate of r_m (see below) is available, the assignment is to the lowest category for which any of the available parameters fits. For each of these categories, AFS has suggested thresholds for decline over the longer of 10 years or three generations. If an observed decline measured in biomass or numbers of mature individuals exceeds the indicated threshold value, the population or species is considered vulnerable to extinction unless explicitly shown otherwise. If one sex strongly limits the reproductive capacity of the species or population, then only the decline in the limiting sex should be considered. We decided to restrict the automatic assignment of resilience categories in the Key Facts page to values of K, t_m and t_{max} and those records of fecundity estimates that referred to minimum number of eggs or pups per female per year, assuming that these were equivalent to average fecundity at first maturity (Musick 1999). Note that many small fishes may spawn several times per year (we exclude these for the time being) and large live bearers such as the coelacanth may have gestation periods of more than one year (we corrected fecundity estimates for those cases reported in the literature). Also, we excluded resilience estimates based on r_m (see below) as we are not yet confident with the reliability of the current method for estimating rm. If users have independent r_m or fecundity estimates, they can refer to Table 1 for using this information*."

Parameter	**High**	**Medium**	**Low**	**Very low**
Threshold	0.99	0.95	0.85	0.70
r_{max} (1/year)	> 0.5	0.16 – 0.50	0.05 – 0.15	< 0.05
K (1/year)	> 0.3	0.16 – 0.30	0.05 – 0.15	< 0.05
Fecundity (1/year)	> 10,000	100 – 1000	10 – 100	< 10
t_m (years)	< 1	2 – 4	5 – 10	> 10
t_{max} (years)	1 - 3	4 – 10	11 – 30	> 30

Taken from the FishBase manual, "Estimation of Life-History Key Facts":
http://www.fishbase.us/manual/English/key%20facts.htm#resilience]

Appendix B – Background on the 5% catch rule

The proposed fishery assessment methodology uses a species categorisation approach to divide the catch in the assessment fishery into groups. These groups are:

- **Category A:** "Target" species with a species-specific management regime in place.
- **Category B:** "Target" species with no species-specific management regime in place.
- **Category C:** "Non-target" species with a species-specific management regime in place.
- **Category D:** "Non-target" species with no species-specific management regime in place

The distinction between 'target' and 'non-target' species is made to enable the assessment to consider the impact of the fishery on all the species caught regularly, without requiring a full assessment be conducted for each. Thus 'target' species are subjected to a more detailed assessment, while 'non-target' species are considered more briefly. For the purposes of the IFFO RS fishery assessment, 'target' and 'non-target' species are defined by their prevalence in the catch, by weight. Applicants must declare which species are considered 'target' species in the fishery, and the combined weight of these must be at least 95% of the annual catch. The remaining 5% can be made up of 'non-target' species. Note also that ETP species are considered separately, irrespective of their frequency of occurrence in the catch.

The proposed use of 5% as a limit for 'non-target' species is one area in which feedback is being sought via the public consultation. The decision to propose a value of 5% ensures consistency with other fishery assessment programmes, such as the MSC which uses 5% to distinguish between 'main' and 'minor' species (see MSC Standard, SA3.4 and GSA3.4.2); and Seafood Watch, which uses 5% when defining the 'main' species for the assessment (see Seafood Watch Standard, Criterion 2). The value is also consistent with the approached used in Version 1 of the IFFO RS Standard, in which up to 5% of the raw material could be comprised of 'unassessed' species.