RESPONSIBLE SUPPLY

IFFO RS Limited

T: +44 (0) 2030 539 195
E: Standards@iffors.com
W: www.iffors.com

Unit C, Printworks | 22 Amelia Street
London, SE17 3BZ | United Kingdom

RESPONSIBLE
SUPPLY
IFFO
RS
ASSURED

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

IFFO RS
Global Standard for Responsible Supply of Marine Ingredients

Fishery Under Assessment	Skipjack tuna *Katsuwonus Pelamis* FAO 51,57 (Indian Ocean)
Date	April 2019
Assessor	Jim Daly

Application details and summary of the assessment outcome				
Name: Sarval				
Address:				
Country: Spain		**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	Vito Romito	0.5	Surveillance 1	By-product
Assessment Period	2018			

Scope Details	
Management Authority (Country/State)	Indian Ocean Tuna Commission (IOTC)
Main Species	Skipjack tuna *Katsuwonus pelamis*
Fishery Location	FAO 51, 57 Indian Ocean
Gear Type(s)	Purse seine, gillnet, pole and line
Outcome of Assessment	
Overall Outcome	Pass
Clauses Failed	None
Peer Review Evaluation	Approve
Recommendation	Pass

Assessment Determination

Skipjack tuna in the Indian Ocean are considered a single stock for stock assessment purposes. They are managed by the Regional RFMO, the Indian Ocean Tuna Commission, its resolutions are binding on members. Scientific advice is provided by the IOTC's Scientific Committee (SC). No new stock assessment was carried out for skipjack tuna in 2018, thus stock status is determined on the basis of the 2017 assessment and other indicators presented in 2018. The Working Party on Tropical Tunas (WPTT) will conduct a full assessment of the species in the assessment area in 2020.

The final overall estimate of stock status indicates that the stock is at target biomass reference point and that current and historical fishing mortality rates are estimated to be below target. Over the history of the fishery, biomass has been well above and the fishing mortality has been well below established limit reference points. Thus, on the weight-of-evidence available in 2018, the skipjack tuna stock is determined by the SC to be not overfished and is not subject to overfishing.

Total catches in 2017 were 12% larger than the resulting catch limit from the skipjack HCR for the period 2018-2020. It should be noted that skipjack catches for most gears have increased from 2016 to 2017 (+10%for purse seine, +16% for gillnet and +17% for bait boats). The Commission needs to ensure that catches of skipjack in the 2018‑2020 period do not exceed the agreed limit.

Fishery removals of skipjack tuna are included in the stock assessment process and the stock is considered, in its most recent assessment, to have a biomass above its limit reference point. It passes clause C.

Due to its specific life traits, skipjack can respond quickly to ambient foraging conditions driven by ocean productivity. Environmental indicators should be closely monitored to inform on the potential increase/decrease of stock productivity. There is a ban on discarding tropical tuna (bigeye, skipjack and yellowfin) caught in purse seine fisheries; the use of artificial lights and aircraft are prohibited in purse seine fisheries.

Uncertainty remains on reported catches from the coastal fisheries of Sri Lanka, Comoros and Madagascar. Observer coverage is low in the purse seine fishery (5%) and much lower than levels mandated by other RFMO's. Interactions between sea turtles, sharks and other fish do occur in associated purse seine fisheries.

Skipjack tuna is categorised as of least concern on IUCN's Red List of Threatened Species and is not listed on CITES (http://www.iucnredlist.org/details/170310/0, accessed 24.04.19).

Skipjack tuna in the Indian Ocean is recommended for approval as by-product material under the IFFO RS Standard v 2.0 for the production of fishmeal and fish oil.

Peer Review Comments

The FAO Area 51, 57 Indian Ocean skipjack tuna stocks have been assessed here.

Skipjack tuna is managed by the RFMO, the Indian Ocean Tuna Commission and its resolutions are binding on its members. Scientific advice is provided by the IOTC's Scientific Committee supported by working parties.

Skipjack tuna in the Indian Ocean are considered a single stock for stock assessment purposes. The latest stock assessment (fishery independent) was undertaken in 2017. The advice on status of skipjack tuna was derived using an integrated statistical assessment method (IO GRID). 36 model formulations were used to ensure that various plausible sources of uncertainty were incorporated and represented in the final result.

Annual catches by gear (purse seine, gillnet, pole and line, handline, trolling) have been routinely reported by IOTC and are used for stock assessment purposes. As such, it passes clause C1.1.

The final overall estimate of stock status indicates that the stock is at the target biomass reference point and that current and historical fishing mortality rates are estimated to be below target. The stock is considered, in its most recent assessment, to have a biomass above its limit reference point. It passes clause C1.2.

The Peer Reviewer agrees that Skipjack tuna in the Indian Ocean should be recommended for approval as by-product material under the IFFO RS Standard v 2.0 for the production of fishmeal and fish oil.

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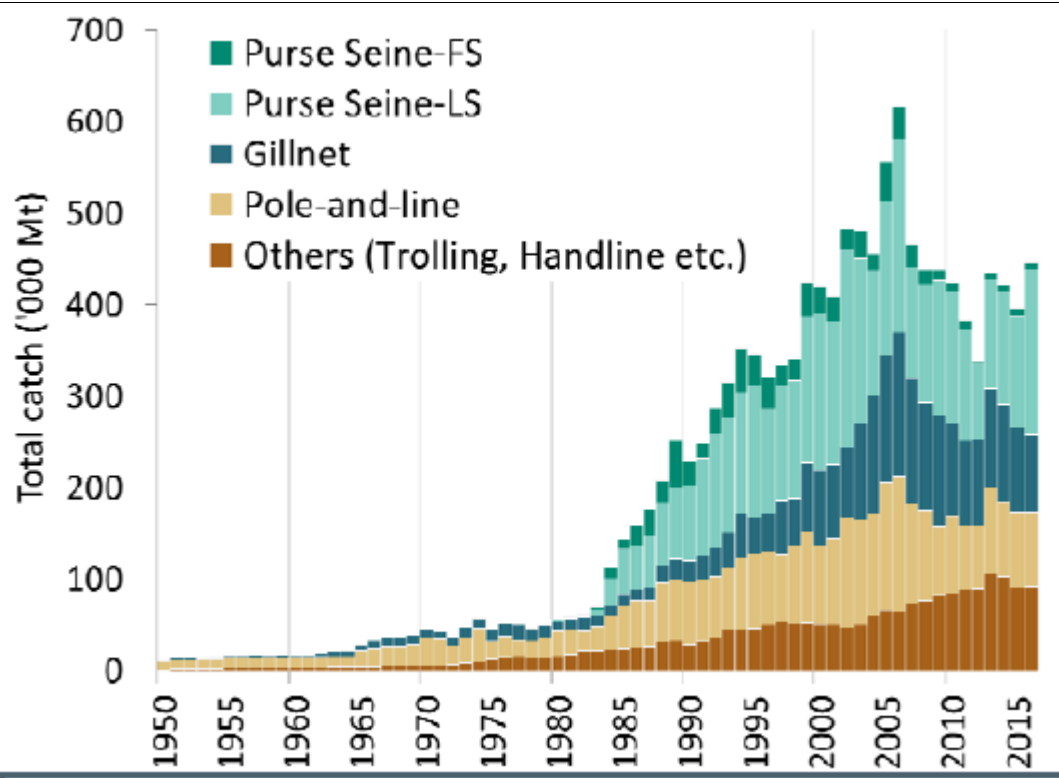**Category D:** No species-specific management regime in place.

Common name	Latin name	Stock	% of landings	Management	Category
Skipjack tuna	*Katsuwonus pelamis*	FAO 51, 57	N/A	IOTC	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:

Skipjack tuna is managed by the RFMO, the Indian Ocean Tuna Commission and its resolutions are binding on its members. Scientific advice is provided by the IOTC's Scientific Committee supported by working parties. Skipjack tuna fall within the remit of the Working Party on Tropical Tunas (WPTT).

Skipjack tuna in the Indian Ocean are considered a single stock for stock assessment purposes. The latest stock assessment (fishery independent) was undertaken in 2017. Stock status was estimated using 144 models (IO GRID) running a range of permutations of the parameters which included 2 CPUE options, 2 growth options, 3 values of stock recruit steepness amongst others. The advice on status of skipjack tuna was derived from the grid and agreed using an integrated statistical assessment method. 36 model formulations were used to ensure that various plausible sources of uncertainty were incorporated and represented in the final result.

Annual catches by gear have been reported by IOTC (**Figure 1**):

Figure 1. Annual catches of skipjack tuna by gear (1950‑2016). Definition of fisheries: Gillnet, including offshore gillnet; Pole-and-Line; Purse seine free-school (FS); Purse seine associated school (LS); Other gears (e.g., troll line, handline, beach seine, Danish seine, liftnet). Source: IOTC, 2018 **R3**

Fishery removals of the species in the fishery under assessment are included in the stock assessment process **R1-R3**

C1.2:
MSY-based reference points have been defined for the stock (**R5**):

Stock	Target Reference Point	Limit Reference Point
Skipjack tuna	$B_{TARGET} = B_{MSY}$ $F_{TARGET} = F_{MSY}$	$B_{LIM} = 0.40\ B_{MSY}$ $F_{LIM} = 1.50\ F_{MSY}$

Where MSY-based reference points cannot be robustly estimated alternate reference points are calculated. IOTC Resolution 15/10 specifies that they should be defined as follows:

"*Biomass limit reference points will be set at a rate of B_0. Unless the IOTC Scientific Committee advises the Commission of more suitable limit reference points for a particular species, by default, the interim B_{LIM} will be set at 0.2 B_0 and fishing mortality rate limit reference point at $F_{0.2\ Bo}$ (the value corresponding to this biomass limit reference point). ''* (**R5**)

IOTC (2018) has published a stock status summary based on the 2017 assessment and other indicators presented in 2018 (**Figure 2**):

Skipjack tuna		
Katsuwonus pelamis	Catch in 2017:	524,282 t
	Average catch 2013–2017:	454,103 t
	$Yield_{40\%SSB}$ (1000 t) (80% CI):	510.1 (455.9–618.8)
	$C_{2016}/C_{40\%SSB}$ (80% CI):	0.88 (0.72-0.98)
	SB_{2016} (1000 t) (80% CI):	796.66 (582.65-1,059.40)
	Total biomass B_{2016} (1000 t) (80% CI):	910.4 (873.6-1195)
		1.00 (0.88–1.17)
	$SB_{2016}/SB_{40\%SSB}$ (80% CI):	0.40 (0.35–0.47)
	SB_{2016}/SB_0 (80% CI):	0.59 (0.53-0.65)
	$E_{40\%SSB}$ (80% CI):	2,015,220 (1,651,230–
	SB_0 (80% CI):	2,296,135)

Figure 2: 2018. STATUS SUMMARY FOR Skipjack tuna **R4**

The final overall estimate of stock status indicates that the stock is at the target biomass reference point and that current and historical fishing mortality rates are estimated to be below target.

The stock is considered, in its most recent assessment, to have a biomass above its limit reference point. It passes clause C1.2

References
R1 IOTC, 2018 Skipjack tuna supporting information.
https://www.iotc.org/sites/default/files/documents/science/species_summaries/english/Skipjack%20tuna%20Supporting%20information.pdf
R2 IOTC, 2018 Executive summary – Skipjack tuna.
https://www.iotc.org/sites/default/files/documents/science/species_summaries/english/Skipjack_tuna.pdf
R3 IOTC 2017 Executive summary – Skipjack tuna
IOTC, 2017b. Executive summary – Skipjack tuna. Updated December, 2017.
http://www.iotc.org/sites/default/files/documents/science/species_summaries/english/Skipjack_tuna.pdf
R4 IOTC (2018) Summary stock status from the latest Scientific Committee Report:
https://www.iotc.org/node/3379
R5 IOTC Conservation and Management Measures: Resolution 15/10 On target and limit reference points and a decision framework https://iotc.org/cmm/resolution-1510-target-and-limit-reference-points-and-decision-framework

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.