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

Fishery Under Assessment	Pacific saury (*Cololabis Saira*) FAO 61
Date	**August 2019**
Assessor	**Jim Daly**

Application details and summary of the assessment outcome		
Name: T.C. Union Agrotech; Golden Prize Canning Co LTD		
Address:		
Country: Thailand	**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	Re-approval	By-product

Assessment Period	2018

Scope Details	
Management Authority (Country/State)	Thailand, Japan
Main Species	Pacific Saury (*Cololabis Saira*)
Fishery Location	Pacific Northwest FAO 61
Gear Type(s)	Stick-held dip net
Outcome of Assessment	
Overall Outcome	PASS
Clauses Failed	None
Peer Review Evaluation	Approve
Recommendation	PASS

Assessment Determination
Pacific saury (*Cololabis saira*) has been harvested by China, Japan, Korea, Russia, and Chinese Taipei. These vessels mainly use stick-held dip nets or lift nets (a similar fishing method which uses fishing lamps) to catch Pacific saury. While Japanese and Russian vessels operate mainly within their EEZs, Chinese, Korean, and Chinese Taipei vessels operate mainly in the high seas of the North Pacific.

There is a fishery management framework at national levels, applied specifically to Pacific Saury. Fisheries management in general is supported by data collection and stock assessment, and species-specific research is carried out by the Small Scientific Committee of the North Pacific Fisheries Commission (NPFC).

An assessment was undertaken in 2018. A Bayesian state-space production model, used in the previous stock assessments was employed for 1980-2018 as an agreed provisional stock assessment model. Scientists from three Members (China, Japan and Chinese Taipei) each conducted analyses following agreed specification for six base case models as well as six sensitivity case models. Fishery removals of the species in the fishery under assessment are included in the stock assessment process.

Graphical presentations for times series of a) biomass (B), b) B-ratio (=B/Bmsy), c) exploitation rate (F), d) F-ratio (F/Fmsy) and e) B/K and the Kobe plot with time trajectory using aggregated model outcomes was presented by the Scientific Committee. The species is considered, in its most recent stock assessment, to have a biomass above the limit reference point (or proxy).

Cololabis saira has not been assessed under the IUCN Red List nor is it listed in the CITIES appendices (accessed 30.08.19).

The assessment team recommends the approval of this by-product against the IFFO-RS by-product standard.

Peer Review Comments
An assessment was undertaken in 2018. A Bayesian state-space production model, used in the previous stock assessments was employed for 1980-2018 as an agreed provisional stock assessment model. Fishery removals of Pacific saury are included in the stock assessment. Data used in the assessment also included stick-held dip net commercial fishery data and data from surface-trawling research cruise data (2003‑2016). The species is considered, in its most recent stock assessment, to have a biomass above the limit reference point (or proxy). The Peer Reviewer agrees that this species should be approved as by-product against the IFFO-RS by-product standard.

Notes for On-site Auditor

Note: This table should be completed for whole fish assessments only.

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.

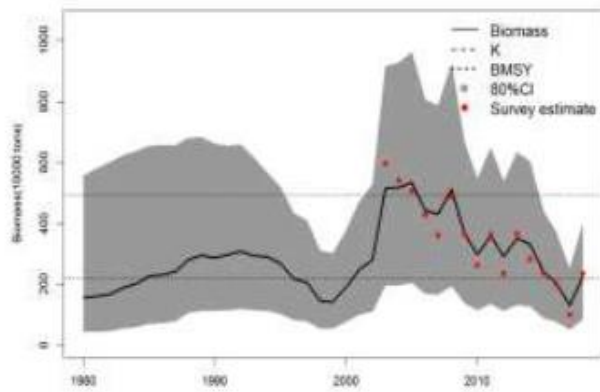| Common name	Latin name	Stock	% of landings	Management	Category
Pacific saury	*Cololabis Saira*	FAO 61	N/A	NPFC	C

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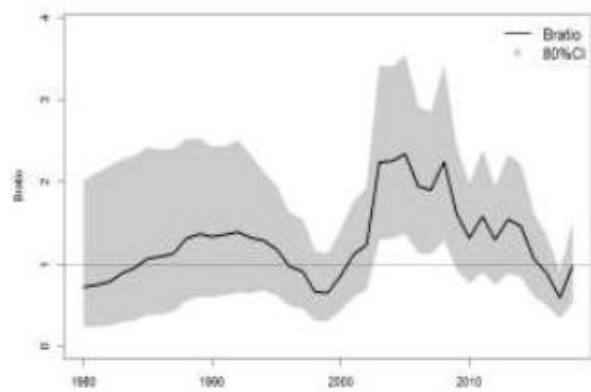
Clause C1 should be completed for **each** Category C species. If there are no Category C species in the fishery under assessment, this section can be deleted. A Category C species does not meet the minimum requirements of clause C1 should be re-assessed as a Category D species.

Species Name	Pacific saury *Cololabis Saira*	
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.	Yes
	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.	Yes
		Clause outcome:	**Pass**

Evidence

C1.1

An assessment was undertaken in 2018. A Bayesian state-space production model, used in the previous stock assessments was employed for 1980-2018 as an agreed provisional stock assessment model. Scientists from three Members (China, Japan and Chinese Taipei) each conducted analyses following agreed specification for six base case models as well as six sensitivity case models.

The six base case models covered three different assumptions of prior distribution for catchability (q) of the Japanese biomass survey index 1) q from 0.1 to 1; 2) q fixed at 1; and 3) q from 0.1 to 317 and two scenarios where the Japanese early CPUE was either used or not used.

For the three base case scenarios that used the Japanese early CPUE, time-varying catchability was assumed because of the stated increase of catchability between 1980 and 1994. A higher weight was given for the Japanese biomass survey estimates compared to that for the Members' CPUEs.

The CPUE data were modelled as nonlinear indices of biomass. Members used similar approaches with some differences in the assumption of the time-varying catchability and prior distributions for the free parameters in the model**.**

Data used in the assessment also included stick-held dip net commercial fishery data and data from surface-trawling research cruise data (2003‑2016).

Fishery removals of Pacific saury are included in the stock assessment.

C1.2

Graphical presentations for times series of a) biomass (B), b) B-ratio (=B/Bmsy), c) exploitation rate (F), d) F-ratio (F/Fmsy) and e) B/K are shown in **Figure 1**. The Kobe plot with time trajectory using aggregated model outcomes is shown **in Figure 2:**
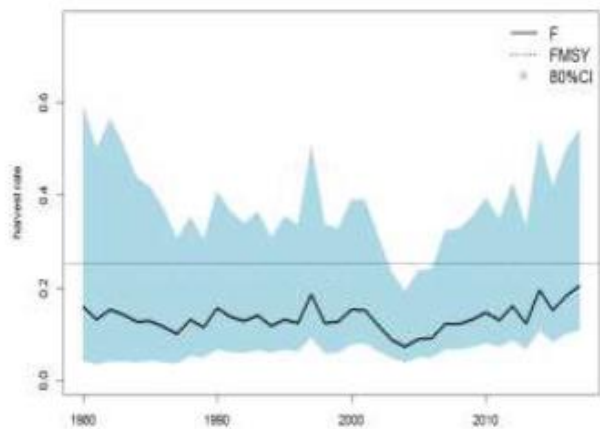
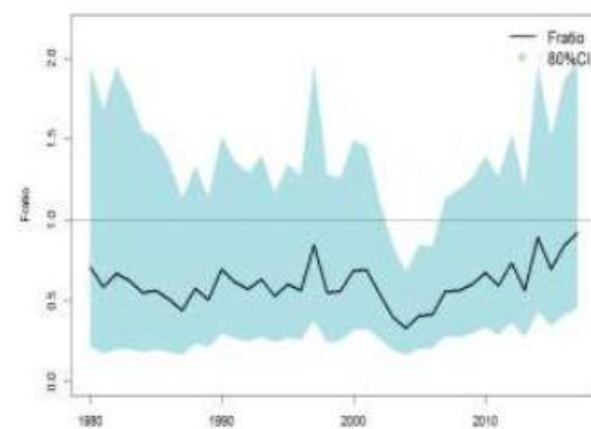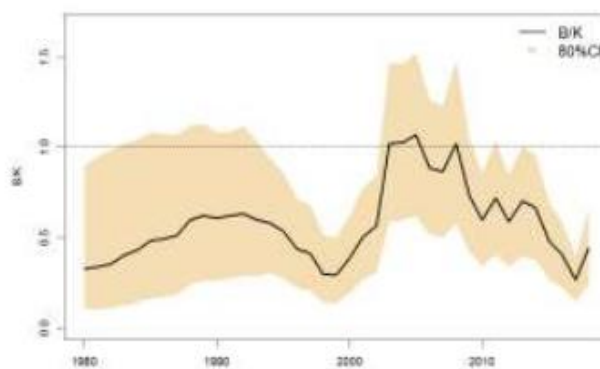**Figure 1:** Time series plots for five key reference quantities: a) biomass (B), b) B-ratio (=B/Bmsy), c) exploitation rate (F), d) F-ratio (F/Fmsy), and e) B/K. The red dots in figure (a) show the survey biomass index by Japan, used in the model for the estimation of biomass. Data aggregated across 18 model results (6 base case models by 3 Members). **R1**
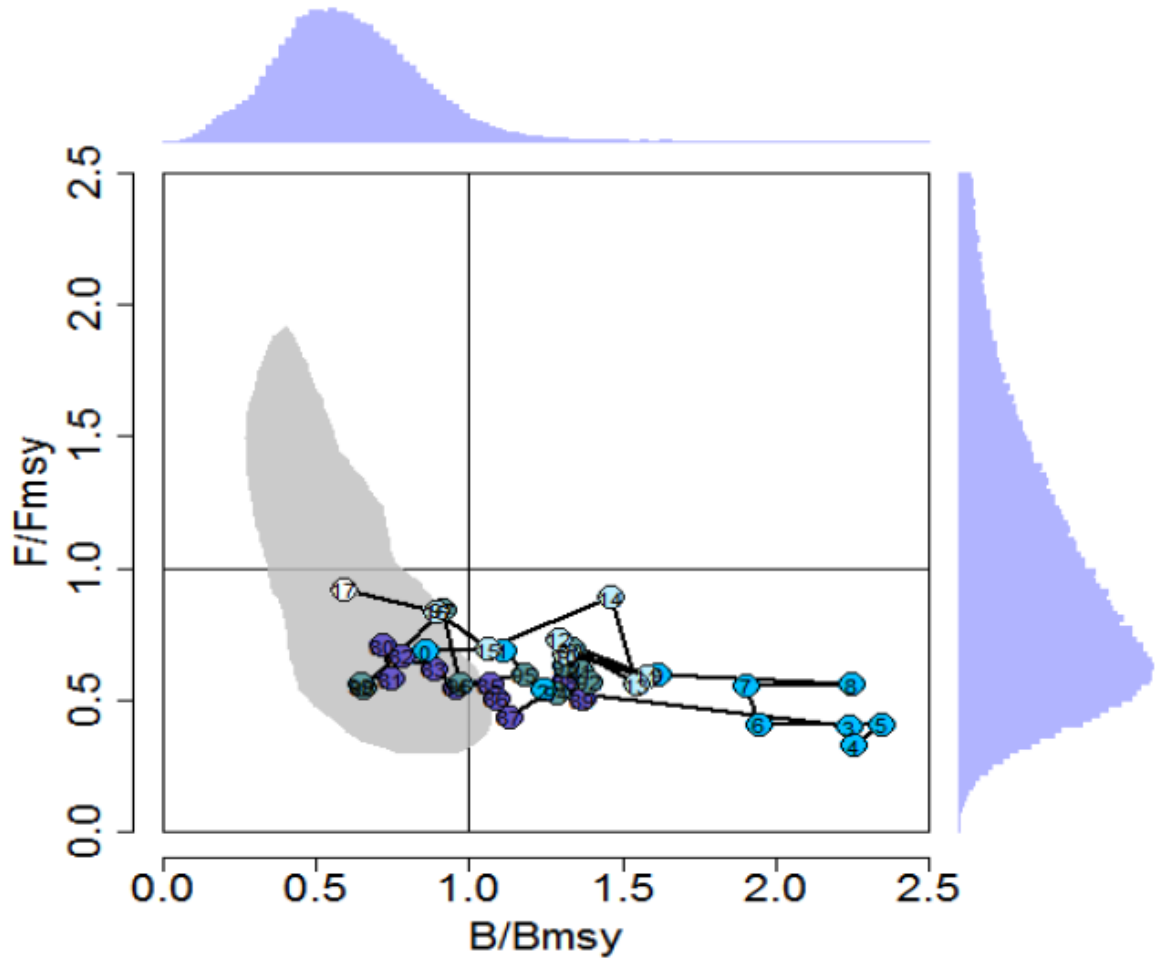
Figure 2: Kobe plot with time trajectory. Data aggregated across 18 model results (6 base-case models by 3 Members). **R1**

B was below Bmsy (average B/Bmsy during 2016-2018 = 0.82) and F was below Fmsy (average F/Fmsy during 2015-2017 = 0.82). Results indicate that the stock declined from near carrying capacity in the mid-2000's after a period of high productivity to current levels. Exploitation rates were increasing slowly during this period but remained lower than Fmsy. Point estimates indicate that stock biomass fell to the lowest value since 1980 (B/Bmsy = 0.63) in 2017, then increased to Bmsy in 2018. Biomass estimates show long-term fluctuations and inter-annual variability.

The species is considered, in its most recent stock assessment, to have a biomass above the limit reference point (or proxy).

References

R1 North Pacific Fisheries Commission 4th Meeting of the Small Scientific Committee on Pacific Saury REPORT April 2019 49pp https://www.npfc.int/sites/default/files/2019-08/SSC%20PS04%20report.pdf

R2 Fishsource: https://www.fishsource.org/search?query=Cololabis Saira&type=

R3 Fishbase: https://www.fishbase.se/Summary/SpeciesSummary.php?ID=303&AT=PACIFIC+SAURY

Standard clauses 1.3.2.2