



RESPONSIBLE  
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**IFFO RS**  
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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Global Standard for Responsible Supply  
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<b>Fishery Under Assessment</b>	<b>Chub mackerel (<i>Scomber japonicus</i>)</b>
<b>Date</b>	<b>February 2019</b>
<b>Assessor</b>	<b>V.Polonio</b>

Application details and summary of the assessment outcome				
Name: TC Union				
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
V. Polonio	V.Romito	1	Surveillance 2	By-product
Assessment Period	2018			

Scope Details	
Management Authority (Country/State)	Thailand
Main Species	Chub mackerel ( <i>Scomber japonicus</i> )
Fishery Location	FAO 61 Pacific Northwest
Gear Type(s)	Purse seine
Outcome of Assessment	
Overall Outcome	Pass
Clauses Failed	None
Peer Review Evaluation	Maintain approval
Recommendation	Approve

Assessment Determination
<p>This by-product is imported to Thailand from Japan and China, FAO area 61. Therefore two different stock have been considered in the report, one coming from Japan for which stock assessment information is available. This stock is assessed as category C, and although the information is slightly outdated, there are indications of improvement in the spawning stock biomass (SSB).</p> <p>The other stock coming from China has been evaluated under Category C with the information available in the East China, however, due to the lack of update in this information the conclusions is that this stock does not met the requirement under category C. Accordingly, the species has been assessed under Category D due to lack of information. The Productivity-Susceptibility Analysis found that this species has a low vulnerability to fishing.</p> <p>This species is listed as Least Concern on the IUCN Red List. Therefore, the assessment team recommends the approval of this by-product against IFFO –RS v 2.0 standard.</p>
Peer Review Comments
<p><b>Japan Stock</b></p> <p>Fishery removals of chub mackerel are included in the stock assessment process in Japan. The stock assessment is split into two different stocks units: Japan and the Tsushima Current. Data are reported to FPA and surveys are conducted annually. Chub Mackerel is part of 8 pelagic species assessed in a multi-species management system controlled by TAC, therefore total catches are reported and considered in the studies.</p> <p>The biomass of the chub mackerel Pacific stock is slightly higher than Blimit, and 80% of this stock is harvested by the purse seine fishery in the North Pacific region. This stock has been managed under the TAC system and a strict licensing system. Information available states that the trends in biomass index are increasing.</p> <p><b>Chinese Stock</b></p> <p>The Chinese chub mackerel stock has been screened using the Productivity Susceptibility Analysis which resulted in a pass score indicating low vulnerability to fishing.</p> <p>The Peer Reviewer agrees with the recommendation of the assessment team to approve these two by-products against the IFFO – RS standard.</p>

<b>Notes for On-site Auditor</b>

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

## General Results

General Clause	Outcome (Pass/Fail)
M1 - Management Framework	NA
M2 - Surveillance, Control and Enforcement	NA
F1 - Impacts on ETP Species	NA
F2 - Impacts on Habitats	NA
F3 - Ecosystem Impacts	NA

## Species-Specific Results

Category	Species	% landings	Outcome (Pass/Fail)	
Category A			A1	
			A2	
			A3	
			A4	
Category B				
Category C	Chub mackerel	<i>Scomber japonicus</i>	Japan	
Category D	Chub mackerel	<i>Scomber japonicus</i>	China	

[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
Chub mackerel,	<i>Scomber japonicus</i>	Japan	NA	Japan	C
Chub mackerel,	<i>Scomber japonicus</i>	China	NA	China	D

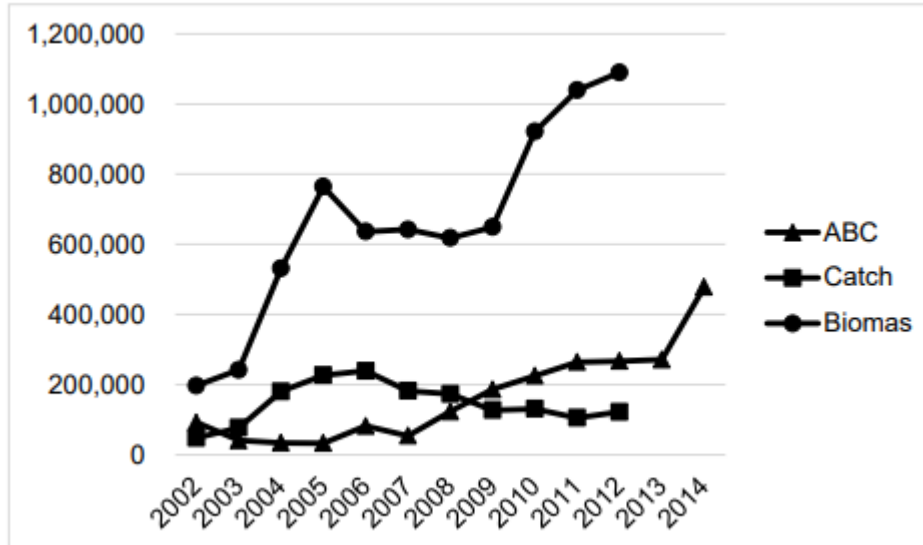
## CATEGORY C SPECIES

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		Chub Mackerel - Japan Stock	
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			
<b>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.</b>			
Fishery removals of chub mackerel are included in the stock assessment process in Japan. The stock assessment is split into two different stocks units: Japan and the Tsushima Current. Data are reported to FPA and surveys are conducted annually. Chub Mackerel is part of 8 pelagic species assessed in a multi-species management system controlled by TAC therefore total catches are reported and considered in the studies. Consequently, the assessment team concludes that C1.1 is met.			
<b>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.</b>			
Stock biomass of the Pacific stock of <i>Scomber japonicus</i> decreased from 4-6 million tons during the early and mid 1970's to less than one million tons in the 1990's. This decline was probably caused from overfishing and decreased reproductive success corresponding to regime shifts in the late 1970's and 1980's. The management system decided to keep the spawning stock biomass (SSB) above 0.45 million tons, because 1) no recruitment failures were observed above this level and 2) this SSB can be attained by preserving dominant year classes until their maturation (age-3). Figure 1 shows the status of the biomass, TAC and the reported catch. The catch is decreasing due to fishing effort also decreasing and that is allowing stock biomass recovery.			
The biomass of the chub mackerel Pacific stock is slightly higher than Blimit, and 80% of this stock is harvested by the purse seine fishery in the North Pacific region. This stock has been managed under the TAC system and a strict licensing system. The biomass of pelagic species including the chub mackerel Pacific stock has fluctuated over time. There is a new multi-species system that should include current TAC system and licensing system, and the TAC for chub mackerel Pacific stock should be a separate TAC, instead of a mackerel species' collective TAC. However, the information available state that the trends in biomass index are increasing and therefore the assessment team concludes that C1.2 is met.			





**Figure 1.** ABC, total catch and biomass trends over the years of *Scomber Japonicus* stock in Pacific waters. Source: FPA **R1**

## References

**R1** Fisheries Research Agency Japan (2013). The population sizes of the Pacific stocks of Japanese sardine (*Sardinops melanostictus*) and chub mackerel (*Scomber japonicus*) are continuously increasing.

<https://www.fra.affrc.go.jp/english/press/2013/20130625.html>

**R2** [https://www.fishsource.org/stock\\_page/1649](https://www.fishsource.org/stock_page/1649)

**R3** Wataru Tanoue. Thesis. Japan's Total Allowable Catch Systems in Fishery Resource Management

*Standard clauses 1.3.2.2*

Species Name		Chub Mackerel - China Stock	
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.	No
	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.	No
Clause outcome:			Fail
Evidence			
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.			
The chub mackerel ( <i>Scomber japonicus</i> ) has been one of the important commercial pelagic species in the East China Sea however the information available is limited to evaluate the stock status in the area. Recent studies have used information from the commercial fisheries from 2009 and 2010 and some reference points have been estimated. However, the assessment team is not sufficiently confident to conclude that all removals are taken into consideration when the stock status is defined. Therefore C1.1 is not met.			
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.			
A recent publication by Wang at al 2013 estimated the maximum sustainable yield (MSY) for the stock and built a spawner–recruitment relationship based on the fishery statistics of purse seine vessels, lighting purse seine vessels and deep-water purse seine vessels from 2006 to 2012. They predicted the biomass, spawning biomass, catches and the length compositions of catches when fishing at the current intensity (fishing mortality (F) = 0.7). The results showed that the MSY of chub mackerel is about 18.8 × 104t, and the fishing effort at MSY (EMSY) is about 72 standard purse seine vessels (both the lighting purse seine vessels and deep-water purse seine vessels were standardized to purse seine vessels), which is equivalent to F = 0.4. If F remains at the current level, the biomass of chub mackerel will remain at 45.3 × 104t. At the same time, more than 40% in the catch will be = individuals smaller than 200 mm, and only about 8% will be larger than 300 mm. Thus, there is little potential for further exploitation of the chub mackerel resources in the central East China Sea, and it is better to reduce F to less than 0.4 for sustainable utilization. However there is not recent data to conclude the current situation of the stock and since 2013 there is no update in the stock status or is not well known. Therefore, the assessment team concludes there is a lack of information to define is the stock is above limits and consequently C 1.2 is not met.			
References			
R4 Wang, Yingbin & Zheng, Ji & Yu, Cungen. (2013). Stock assessment of chub mackerel ( <i>Scomber japonicus</i> ) in the central East China Sea based on length data. Journal of the Marine Biological Association of the United Kingdom. 94. 211-217. 10.1017/S0025315413001434.			
Standard clauses 1.3.2.2			

## CATEGORY D SPECIES

In a whole fish assessment, Category D species are those which make up less than 5% of landings and are not subject to a species-specific management regime. In the case of mixed trawl fisheries, Category D species may make up the majority of landings. In a by-product assessment, Category D species are those which are not subject to a species-specific management regime. In both cases, the comparative lack of scientific information on the status of the population of the species means that a risk-assessment style approach must be taken.

The process for assessing Category D species involves the use of a Productivity-Susceptibility Analysis (PSA) to further subdivide the species into ‘Critical Risk’, ‘Major Risk’ and ‘Minor Risk’ groups. If there are no Category D species in the fishery under assessment, this section can be deleted.

Productivity and susceptibility ratings are calculated using a process derived from the APFIC document “Regional Guidelines for the Management of Tropical Trawl Fisheries, which in turn was derived from papers by Patrick *et al* (2009) and Hobday *et al* (2007). Table D1 should be completed for each Category D species as follows:

- Firstly, the best available information should be used to fill in values for each productivity and susceptibility attribute.
- Table D2 should be used to convert each attribute value into a score between 1 and 3.
- The average score for productivity attributes and the average for susceptibility attributes should be calculated.
- Table D3 should be used to determine whether the species is required to meet the requirements of Table D4. A species which does not need to meet the requirements of D4 is automatically awarded a pass.
- Table D4 should be used to assess those species indicated by Table D3 to determine a pass/fail rating.
- Any Category D species which has been categorised by the IUCN Red List as Endangered or Critically Endangered, or which appears in the CITES appendices, automatically results in a fail.

<b>D1</b>	<b>Species Name:</b>	<b>Chub Mackerel – China Stock</b>	
	<b>Productivity Attribute</b>	<b>Value</b>	<b>Score</b>
	Average age at maturity (years)	2-4	2
	Average maximum age (years)	7	1
	Fecundity (eggs/spawning)	100,000 - 400,000	1
	Average maximum size (cm)	30	1
	Average size at maturity (cm)	26.1	1
	Reproductive strategy	Broadcast spawner	1
	Mean trophic level	3.4	3
	<b>Average Productivity Score</b>		<b>1.42</b>
	<b>Susceptibility Attribute</b>	<b>Value</b>	<b>Score</b>
	Overlap of adult species range with fishery	30 %	2
	Distribution	Global distribution	1
	Habitat	Pelagic-neritic	2
	Depth range	0-300	2
	Selectivity	1 to 2 times mesh size	2
	Post-capture mortality	Most dead, retained	3
	<b>Average Susceptibility Score</b>		<b>2</b>
	<b>PSA Risk Rating (From Table D3)</b>		<b>PASS</b>
	<b>Compliance rating</b>		<b>PASS</b>
	<b>References</b>		
	<b>R5</b> Fish Base <a href="http://fishbase.org/summary/Scomber-japonicus.html">http://fishbase.org/summary/Scomber-japonicus.html</a>		
	<b>R6</b> IUCN Redlist <a href="http://www.iucnredlist.org/details/170306/0">http://www.iucnredlist.org/details/170306/0</a>		
	<i>Standard clauses 1.3.2.2</i>		

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.

<b>D3</b>		<b>Average Susceptibility Score</b>		
		<b>1.00 – 1.75</b>	<b>1.76 – 2.24</b>	<b>2.25 – 3.00</b>
<b>Average Productivity Score</b>	<b>1.00 – 1.75</b>	PASS	PASS	PASS
	<b>1.76 – 2.24</b>	PASS	PASS	TABLE D4
	<b>2.25 – 3.00</b>	PASS	TABLE D4	TABLE D4

<b>D4</b>	<b>Species Name</b>		
	<b>Impacts On Species Categorised as Vulnerable by D1-D3 - Minimum Requirements</b>		
	D4.1	The potential impacts of the fishery on this species are considered during the management process, and reasonable measures are taken to minimise these impacts.	
	D4.2	There is no substantial evidence that the fishery has a significant negative impact on the species.	
			<b>Outcome:</b>
<b>Evidence</b>			
<b>References</b>			
<i>Standard clause 1.3.2.2</i>			

## 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  $r_m$ . 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 approach used in Version 1 of the IFFO RS Standard, in which up to 5% of the raw material could be comprised of 'unassessed' species.

**Comments on this proposition are welcomed along with any other feedback on the proposed approach.**