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Global Standard for Responsible Supply of Marine Ingredients

Fishery Assessment Methodology and Template Report V2.0

Fishery Under Assessment	Peru Anchovy (*Engraulis ringens*) Northern Border of Peruvian EEZ To 16^0 South
Date	June 2019
Assessor	Jim Daly

Application details and summary of the assessment outcome				
Name: Austral Group: S.A.A - Pisco; S.A.A - Coishco; S.A.A- Chancay. Pesquera Diamante S.A- Malabrigo and others				
Address:				
Country: Peru		**Zip:**		
Tel. No.:		**Fax. No.:**		
Email address:		**Applicant Code**		
Key Contact:		**Title:**		
Certification Body Details				
Name of Certification Body:		SAI Global Ltd		
Assessor Name	**Pier Reviewer**	**Assessment Days**	**Initial/Surveillance /Re-approval**	**Whole fish/ By-product**
Jim Daly	Virginia Polonio	3	Re-approval	Whole fish
Assessment Period	2018			

Scope Details	
Management Authority (Country/State)	Ministry of Production (PRODUCE).
Main Species	Anchovy (*Engraulis ringens*)
Fishery Location	Northern Border of Peruvian EEZ To 16^0 South
Gear Type(s)	Purse seine (industrial)
Outcome of Assessment	
Overall Outcome	PASS
Clauses Failed	NONE
Peer Review Evaluation	Approve
Recommendation	**Pass**

Assessment Determination

Anchovy (*Engraulis ringens*) in the South-eastern Pacific is widely distributed, ranging the full length of the South American coastline. This assessment is concerned with the northern most stock, the Peruvian North-central anchovy fishery which extends from the northern end of the Peruvian EEZ down to 16^0S.

Total fishing mortality is restricted using a system of TAC and Catch Limit per Vessel. Catch restrictions cover both industrial and artisanal fleets, and place both Peruvian anchovy (*Engraulis ringens*) and Longnose anchovy (*Anchoa nasus*) in a single management unit.

In this report Anchoveta fishery for indirect consumption is assessed, Anchoveta from artisanal fleet which is exclusively for human consumption is not included in the scope of this report. However, some references in the reports are aimed at both fisheries as both fisheries artisanal and industrial have regulations and management measures in common, that means that applies for all the fleet independently whether is for direct or indirect consumption. Having said that, the assessor points out that just the indirect fishery is in the scope of this report.

Catches of other small pelagic fishes such as the South American pilchard (*Sardinops sagax);* Jack Mackerel (tab*Trachurus murphyi*); Chub mackerel (*Scomber japonicus*) and the Humboldt squid (*Dosidicus gigas*) have begun to contribute to sizeable catches and will be considered in future assessments.

Spatial distribution indices derived from acoustic surveys (2018 data) show that the stock has increased in area in addition to increasing in density. Estimated Biomass (period to 01 April 2018) rose to 10.86 million tons, 33% greater than the average of biomass estimates obtained during annual summer surveys undertaken since 1994.

Fishery stakeholder delegates can participate in evaluation cruises and are invited to comment on these evaluations. A framework for sanctions of violation of Laws and regulations do exist but do not work efficiently. In January 2019 PRODUCE (Ministry of Production) published Protocol (No. 054-2019-MP-FN which aims to establish procedures that must be developed to execute interdiction operations against illegal fishing activities. Also, in February 2018 PRODUCE signed a Memorandum of Understanding (MOU) with one of the current Fisheries Improvement Project (FIP) stakeholders CeDePesca that establishes terms for technical collaboration towards fisheries' sustainability.

IMARPE reports bycatch species and frequency of occurrence in hauls per fishing season; although no quantitative weight estimates are available.

Fishsource reports that the main threat posed by the fishery to ETP species is via a reduction in food availability; anchovy is an important prey for a range of ETP species including the Humboldt penguin, Peruvian diving petrel, Guanay cormorants, and also non-ETP fur seals and sea lions.

The current FIP in force (to which IMARPE and PRODUCE are signatories) has as one of its goals to make improvements in the management system that would allow for explicit catch control rules in the case of low biomass. This will address one of the key rooms for improvement highlighted in

a previous fisheries assessment report. The most recent report on the FIP awarded the project an A for current progress.
IMARPE, in collaboration with Washington University continue to advance towards the methodological definition of a Management Strategy Evaluation (MSE) for the fishery. Future assessments of the fishery should monitor progress in this domain.

Anchoveta (Anchovy) (*E. ringens*) is approved by the assessment team for the production of fishmeal and fish oil under the IFFO-RS v 2.0 by-products standard for whole fish.

Peer Review Comments

PR agrees with the main conclusions raised in all the clauses but thinks more information is needed in regards with the key role of anchoveta in the ecosystem. There is no information of ecosystems needs and how fisheries removals can affect the ecosystem. Also, the degree of connectivity among stocks between Peru and Chile is a concern for this species.

Assessor adds:

A Working Group convened in 2018 to implement the current Fishery Improvement Project for anchoveta (R21) concluded that IMARPE need to engage further in efforts to determining trophic needs of the ecosystem in relation to anchovy. Workshops will be convened to look at solutions for reducing capture of juveniles and recommendations to improve selectivity of purse seine nets used. At the meeting IMARPE also agreed to update a paper first published in 2010 (author Jorge Tam) on the relationship between anchovy and other ecosystem components. IMARPE now liaise with a consultant to help them achieve their goals.

Notes for On-site Auditor

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

General Results

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

Species-Specific Results

Category	Species	% landings	Outcome (Pass/Fail)	
Category A	Anchovy (*Engraulis ringens*)	>99%	A1	PASS
			A2	PASS
			A3	PASS
			A4	PASS
Category B				
Category C				
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
Anchovy	*Engraulis ringens*	Peru Nth border to 16^0S	>99%	Ministry of Production (PRODUCE).	A

MANAGEMENT

The two clauses in this section relate to the general management regime applied to the fishery under assessment. A fishery must meet all the minimum requirements in every clause before it can be recommended for approval.

M1	Management Framework – Minimum Requirements		
	M1.1	There is an organisation responsible for managing the fishery	PASS
	M1.2	There is an organisation responsible for collecting data and assessing the fishery	PASS
	M1.3	Fishery management organisations are publically committed to sustainability	PASS
	M1.4	Fishery management organisations are legally empowered to take management actions	PASS
	M1.5	There is a consultation process through which fishery stakeholders are engaged in decision-making	PASS
	M1.6	The decision-making process is transparent, with processes and results publically available	PASS
Clause outcome:			**PASS**

Evidence

M1.1:

Fisheries management in Peru falls under the jurisdiction of the Vice-Ministry of Fisheries in the Ministry of Production (PRODUCE). PRODUCE was created in 2002 by Peruvian Law number 27779 and its responsibilities include the development and implementation of policies and management plans, conducting fisheries research, establishing the regulatory framework for fisheries management, and issuing and administering regulations. PRODUCE also has the final say on annual catch limits published through Ministerial Resolutions.

Statutory management controls for the industrial fleet include:

- Spatial: industrial fishing operations is now restricted to 5 nautical miles from the coast;. Mandatory vessel monitoring systems.
- Temporal: closures (to protect juveniles when the proportion is more than 10% of landings in numbers)
- Gear: minimum mesh size (13 mm)
- Minimum landing size of 12cm
- Effort control (one trip per day, satellite positioning system on board
- Discard ban of fishing resources at sea
- Closed entry for new fishing boats in both the industrial and artisanal sectors
- Monitoring by independent third-party operators to verify landing statistics at a total of 134 designated unloading points.

Generic management objectives include ensuring the sustainability of fisheries and of aquatic resources, by managing fisheries with an ecosystem approach, based on best scientific evidence and including consideration of economic and social aspects and maintaining environmental quality by implementing the National Environmental Policy for ecosystem conservation.
R1-R3; R6

M 1.2:
Within PRODUCE, the Instituto del Mar del Peru (IMARPE) is a specialised technical agency with responsibility for designing and conducting scientific research necessary to ensure informed fisheries management decisions are taken. IMARPE is responsible for conducting stock assessments and recommending annual catch limits to PRODUCE. Anchovy is managed by an adaptive system to account for highly ecosystem variability and consequent uncertainty and rapid fluctuations in biomass, typical of this resource and the Humboldt ecosystem (EUR-OCEANS, 2008).

In March 2015 IMARPE published their methodology for generating total permissible catch recommendations. When considered alongside regular reports summarising the outcomes of hydro-acoustic research cruises (Executive Reports) and others detailing the process by which the results of these cruises and length-frequency sampling are used to generate catch recommendations, the process appears to now be fairly transparent.

Results of the decision-making process (catch recommendations) are provided on the PRODUCE website in the form of Ministerial Resolutions.

After carrying out regular biannual hydroacoustic surveys, IMARPE releases catch advice for each fishing season following a set protocol (IMARPE, 2015a) which implies:

- Estimation of stock size structure and biomass using data from acoustic survey
- Projection of size structures under different scenarios (exploitation, growth and mortality, which vary according to expected environmental conditions within the projection period)
- Elaboration of a decision table

When abundance is low and environmental conditions unstable, extra surveys are conducted. Discards are not directly recorded, but rather incorporated into stock assessments indirectly via acoustic surveys and population length frequency data.
R3-R10

M1.3:
Generic management objectives include ensuring the sustainability of fisheries and of aquatic resources, by managing fisheries with an ecosystem approach, based on best scientific evidence and including consideration of economic and social aspects and maintaining environmental quality by implementing the National Environmental Policy for ecosystem conservation.

M1.4:
PRODUCE publishes lists of sanctions invoked and relevant laws, fines, and fishing suspensions on the ministerial website, as required by Regulations of the Organization and Functions of the Ministry of Production.

Other regulations relevant to fisheries sanctions include:

- Ley 25977 Ley General de Pesca (Artículos del 76° al 83°)
- Decreto Supremo 012-2001-PE Reglamento de la Ley General de Pesca (Artículos del 126° al 150°)
- Decreto Supremo 016-2007-PRODUCE Reglamento de Inspecciones y Sanciones Pesqueras Acuícolas.

In January 2019 PRODUCE published Protocol No. 054-2019-MP-FN which aims to establish procedures that must be developed to execute interdiction operations against illegal fishing activities.

R6, R11

M1.5 – **M1.6**
Fishery stakeholder delegates can participate in evaluation cruises and comment on these stock evaluations (pers. comm. with SAI Global Assessor Virginia Polonio and Luis Alfredo Icochea Salas 2018).

In October 2017 a Gap Analysis of the fishery (originally conducted as an MSC Pre Assessment Report by SGS in 2010) was updated and to reflect obligations set out in MSC's Fisheries Standard v2.0 by an expert commissioned by stakeholders involved in the current Fishery Improvement Project (FIP) for anchovy in the assessment area. The performance of the fishery against MSC Performance Indicator 1.1.1 (Stock Status – LTL species) was assessed.

Also, in October 2017 IMARPE signed an agreement with one of the FIP stakeholders (SNP Sociedad Nacional de Pesquería) formalizing its collaboration to the FIP.

In February 2018 PRODUCE also signed a Memorandum of Understanding with FIP Co-ordinators CeDePesca establishing terms for technical collaboration towards fisheries' sustainability.

Stock assessment reports do not appear to be made publicly available, a conclusion supported by the Fishsource profile of the fishery. However, in March 2015 IMARPE published their methodology for generating total permissible catch recommendations.

A key objective of the FIP is to make improvements in the management system that would allow for explicit catch control rules in the case of low biomass, by March 2020. This will address one of the key rooms for improvement highlighted in a previous fisheries assessment report.
R7, R13-R16

References
Please go to reference list at the end of the report

Standard clauses 1.3.1.1, 1.3.1.2

M2	**Surveillance, Control and Enforcement - Minimum Requirements**		
	M2.1	There is an organisation responsible for monitoring compliance with fishery laws and regulations	PASS
	M2.2	There is a framework of sanctions which are applied when laws and regulations are discovered to have been broken	PASS
	M2.3	There is no substantial evidence of widespread non-compliance in the fishery, and no substantial evidence of IUU fishing	PASS
	M2.4	Compliance with laws and regulations is actively monitored, through a regime which may include at-sea and portside inspections, observer programmes, and VMS.	PASS
Clause outcome:			**PASS**

Evidence

M2.1

The implementation and enforcement of fisheries laws and regulations is one of the stated functions of the Ministry of Production, through the Directorate General of Supervision and Control (DGSF), although landings are also monitored and recorded by the international surveillance company SGS.

DGSF publishes and regularly updates a list of vessels prohibited from operating on the fishery, and also lists a significant number of 'featured inspections' and prosecutions on its website. There are many examples of inspection and sanctioning available online. An IFFO-RS industry news update reports that there are at any one time up to 650 inspectors conducting daily control operations across Peru during periods of heavy fishing activity.

R17-R18

M2.2

PRODUCE publishes lists of sanctions invoked and the relevant laws, fines, and fishing suspensions on the ministerial website, as required by Regulations of the Organization and Functions of the Ministry of Production. Other regulations relevant to fisheries sanctions include:

- Ley 25977 Ley General de Pesca (Artículos del 76° al 83°).
- Decreto Supremo 012-2001-PE Reglamento de la Ley General de Pesca (Artículos del 126° al 150°).
- Decreto Supremo 016-2007-PRODUCE Reglamento de Inspecciones y Sanciones Pesqueras Acuícolas.

In January 2019 PRODUCE published Protocol (No. 054-2019-MP-FN) aiming to establish procedures that must be developed to execute interdiction operations against illegal fishing activities.

In April 2019 PRODUCE published Supreme Decree N°005-2017 that constituted improvements in regulations for the fishery for indirect human consumption (IHC).

R2; R3-R6;

M2.3:
Monitoring and compliance regarding discards and zone invasions (industrial vessels operating within the 10nm from the coastline) are expected to increase with the electronic log system and mandatory positioning system now on board for all fleets. Intensive inspections are being conducted at landing points and on-board; with most infractions related to excess of juveniles in the catches; excess of catches and excesses of hold capacity and misreporting.

Seasonal quotas and vessel licensing are the primary management mechanism used to restrict excess to fishing capacity. The fishery is closed to new vessels, there is 24-hour monitoring of all 130 landing locations to ensure that only those vessels with a permit are allowed to land catch. There is substantial evidence that these mechanisms have been successful in the limiting of fishing effort, the most important of which is that seasonal landings have not exceeded quotas (**Table 3**).

In 2010, estimates for undeclared anchoveta catches by fishing companies was 10%, confirming that the data gathering system needed improvement (**R19**). In order to regulate the fishery for both industrial and artisanal fisheries PRODUCE published, in 2016, Decreto Supremo No 024-2016 establishing measures (fines, withdrawal of licences) to strengthen control and inspection. In January 2019 PRODUCE published Protocol (No. 054-2019-MP-FN) aiming to establish procedures that must be developed to execute interdiction operations against illegal fishing activities.

One of the goals of the FIP in progress is to, by 2020, organize available data gathered by industrial fishing vessels and encourage further technological innovation and development in order to allow for the more efficient assessment and monitoring of the ecosystem.

M2.4:
Industrial vessels are required by law to operate a Satellite Tracking System (SISESAT), designed to ensure they remain further than 5nm from the coast. In 2016, a mobile app was introduced by DGSF and then incorporated into the SISESAT system. PRODUCE states that the app allows accredited inspectors check location, speed, direction and distance to coast with more accuracy than traditional satellite systems.
R1-2; R20

References
Please go to reference list at the end of the report

Standard clause 1.3.1.3

CATEGORY A SPECIES

The four clauses in this section apply to Category A species. Clauses A1 - A4 should be completed for **each** Category A species. If there are no Category A species in the fishery under assessment, this section can be deleted. A Category A species must meet the minimum requirements of all four clauses before it can be recommended for approval. If the species fails any of these clauses it should be re-assessed as a Category B species.

Species Name		**Anchovy** *Engraulis ringens*	
A1	**Data Collection - Minimum Requirements**		
	A1.1	Landings data are collected such that the fishery-wide removals of this species are known.	PASS
	A1.2	Sufficient additional information is collected to enable an indication of stock status to be estimated.	PASS
Clause outcome:			**PASS**

Evidence

A1.1 – A1.2:

IMARPE is responsible for the assessment of Peruvian anchovy populations based on direct and indirect methods. Fishery-dependent data are collected when catch is landed and on-board vessels at sea and include effort data. Fishery-independent hydro-acoustic surveys are also carried out regularly. The stock is assessed at least twice per year by real monitoring estimating biomass in the surveys and using integrated population models. Spawning areas are identified and Spawning Stock Biomass (SSB) is estimated using the Egg-Production Method (EPM).

A range of fishery-dependent and fishery-independent data are collected in support of the management of the stock. Landings data are collected by the international surveillance company SGS, and include date and location of catch, plus size frequency sampling.

IMARPE publishes anchovy landings data for every individual day on its website. IMARPE also conducts an observer programme to collect further data during fishing activity.

In addition to the fishery-dependent data collected at landing, IMARPE conducts regular hydro-acoustic cruises, during which size frequency data are also collected. Due to the short-lived nature of the species and the tendency of the population to rapidly fluctuate in size, results of these cruises are essential components of the quota-setting process.

Results of cruises are used to estimate the total biomass of the stock, broken down into 16 latitude-based regions. IMARPE has published biomass estimates for every cruise conducted since 1985.

R5, R7-R8

References

Please go to reference list at the end of the report

Standard clause 1.3.2.1.1

A2	Stock Assessment - Minimum Requirements		
	A2.1	A stock assessment is conducted at least once every 3 years (or every 5 years if there is substantial supporting information that this is sufficient for the long-term sustainable management of the stock) and considers all fishery removals and the biological characteristics of the species.	PASS
	A2.2	The assessment provides an estimate of the status of the biological stock relative to a reference point or proxy.	PASS
	A2.3	The assessment provides an indication of the volume of fishery removals which is appropriate for the current stock status.	PASS
	A2.4	The assessment is subject to internal or external peer review.	PASS
	A2.5	The assessment is made publically available.	PASS
Clause outcome:			**PASS**

Evidence

A2.1

In March 2015 IMARPE published their methodology for generating total permissible catch recommendations. When considered alongside regular reports summarising the outcomes of hydro-acoustic research cruises and others detailing the process by which the results of these cruises and length-frequency sampling are used to generate catch recommendations, the process appears to now be fairly transparent.

Fishery-independent hydro-acoustic surveys are also carried out regularly. The stock is assessed at least twice per year by real monitoring estimating biomass in the surveys and using integrated population models. Spawning areas are identified and Spawning Stock Biomass (SSB) estimated using the Egg-Production Method (EPM). IMARPE has published biomass estimates for every cruise conducted since 1985.

When abundance is lower than historical averages and environmental conditions unstable, intensified monitoring, e.g. extra surveys are requested. A strong El Niño affected the Peruvian coast during 2015 and early 2016, thus, three hydroacoustic surveys were conducted in 2016. In 2018 survey number 1802-04 (North-Central), using the acoustic method, was undertaken.

R7; R8; R13

A2.2 – A2.3:

Estimated Biomass (period to 01 April 2018) rose to 10.86 million tons, 33% greater than the average of annual summer surveys undertaken since 1994 and of biomass estimated in 2017 (8.17 million tons). This estimate is also 79% greater than the biomass estimated during the same period in 2017 (7.78 million tons).

Spatial distribution indices (**Table 1**) show that the stock has increased in area in addition to density:

Table 1. Quantitative indices (spatial and density) observed during acoustic surveys 2015-2018 R8

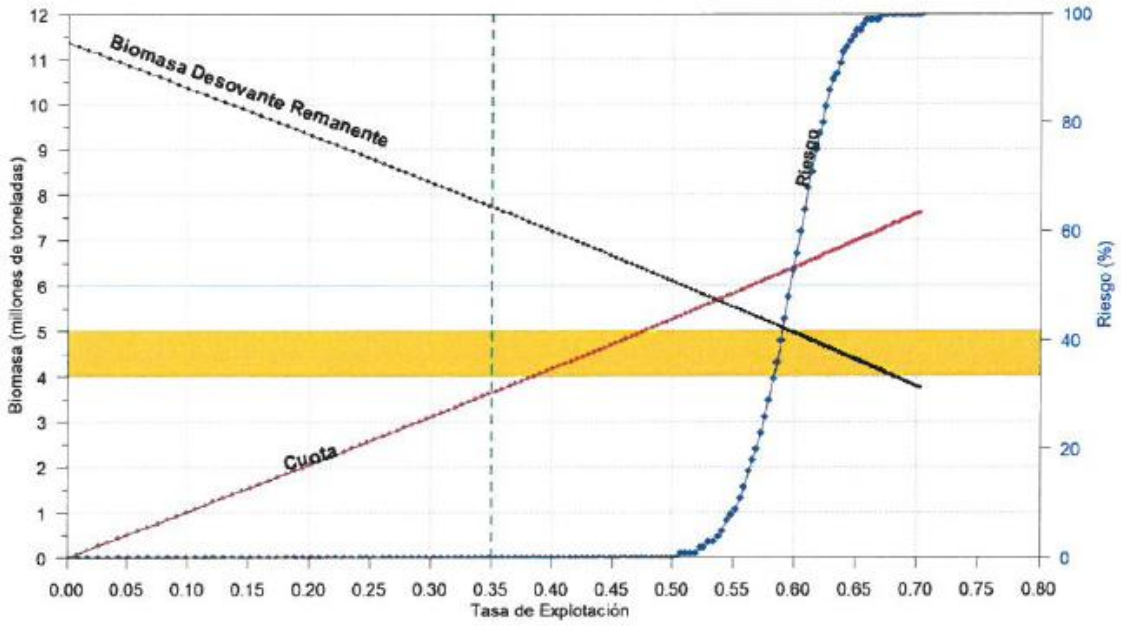
Indicador / Crucero	1502-04	1508-10	1603-04	1605-06	1609-10	1703-04	1709-10	1802-04
1 Área ocupada por el stock / Área estándar*	0.28	0.21	0.15	0.16	0.30	0.18	0.34	0.34
2 Índice de heterogeneidad **	0.89	0.93	0.95	0.95	0.90	0.93	0.95	0.93
3 Centro de gravedad de latitud	10.7	10.2	12.0	12.0	9.10	12.2	10.3	9.8
4 Centro de gravedad de distancia a la costa	17.7	18.7	12.1	13.2	24.9	13.5	13.1	19.1
5 índice de densidad	2.68	1.98	1.95	1.88	1.89	3.2	1.94	2.81

** Área estándar, es el área (en mn2) establecida para fines comparativos entre los 4° a 16°S y desde las 0 a 100 mn de distancia a la costa.*
*** 0: Totalmente homogéneo. 1: Totalmente heterogéneo.*

Additional observations have shown that the stock has moved slightly to the North in the assessment area and also some distance West of the Coast.

A decision table has been used to estimate a sustainable level of fishing mortality for the 2018 season based on the announced quota for 2018 (**Figure 1**). The assumption is of relatively stable environmental conditions.

~~**Figure 1**: Decision table (estimate of F for 2018 season) **R8**~~



- *Spawning stock biomass (SSB): Biomass desovante (remaining in July 2018).*
- *Quota for 2018: Cuota*
- *Riesgo: probability that SSB would fall below the reference level of 5 million tons*

Figure 1. Decision table (estimate of F for 2018 season) **R8**

In order to ensure a sustainable fishery in 2018 the fishing mortality F, as calculated using the decision table, was assessed at 0.35.

R6. R8-R11

A2.4:
In March 2017 a renowned specialist was hired to assist in the implementation of FIP objectives. A report will be provided that assesses the performance of the fishery against MSC Fisheries Standard Performance Indicator 1.1.1 (Stock Status – LTL species). Fishery stakeholder delegates can also participate in evaluation cruises and comment on these stock evaluations.

A2.5:
Stock assessment reports do not appear to be made publicly available, a conclusion supported by the Fishsource profile of the fishery. However, in March 2015 IMARPE published a methodology for generating total permissible catch recommendations.

When considered alongside regular reports summarising the outcomes of hydro-acoustic research cruises and others detailing the process by which the results of these cruises and length-frequency sampling are used to generate catch recommendations, the process appears to now be fairly transparent. The results of the decision-making process are provided on the PRODUCE website in the form of Ministerial Resolutions.

In February 2018 PRODUCE signed a Memorandum of Understanding with one of the FIP stakeholders CeDePesca establishing terms for technical collaboration towards fisheries' sustainability. This is a good development.

R7-R8; R13-R15

References
Please go to reference list at the end of the report

Standard clause 1.3.2.2, 1.3.2.1.2, 1.3.2.1.4

A3	Harvest Strategy - Minimum Requirements		
	A3.1	There is a mechanism in place by which total fishing mortality of this species is restricted	PASS
	A3.2	Total fishery removals of this species do not regularly exceed the level indicated or stated in the stock assessment. Where a specific quantity of removals is recommended, the actual removals may exceed this by up to 10% ONLY if the stock status is above the limit reference point or proxy.	PASS
	A3.3	Commercial fishery removals are prohibited when the stock has been estimated to be below the limit reference point or proxy (small quotas for research or non-target catch of the species in other fisheries are permissible).	PASS
Clause outcome:			**PASS**

Evidence

A3.1

Total fishing mortality is restricted using a system of TAC and Catch Limits per Vessel. Catch restrictions cover the entire industrial fleet, and place both Peruvian anchovy (*Engraulis ringens*) and Longnose anchovy (*Anchoa nasus*) into a single management unit.

Fishing seasons are specified to protect anchovy during main spawning periods in January-March and July – October. Additional management measures in place include:

- Seasonal quotas, with closure of the fishery occurring if the quota is reached
- All vessels must have a valid fishing permit
- Minimum mesh size is 13 mm
- Minimum landing size of 12cm, although up to 10% of individuals may be smaller
- If the presence of juveniles exceeds 10% in the daily landings at a port, fishing will be prohi bited from this port for a minimum of three days
- No fishing within 5 miles of the coast
- All vessels must have an operating satellite positioning system on board
- Daily lists published on the PRODUCE website of permitted and prohibited fishing vessels.

According to IMARPE, landings and exploitation rates have been decreasing since 1994, due to more precautionary fishing policies (IMARPE, 2014). Fishing mortality or exploitation rates are not regularly published, however, fishing effort and CPUE are informed for each fishing season (IMARPE, 2015).

In 2014 only the first fishing season was opened, landings were low, 1.7 million tonnes (68% of set TAC). In the first fishing season of 2015 landings were higher than in 2014; 2.56 million tonnes were caught (99% of set TAC).

Adaptive management is used for this stock due to its strong dependence on environmental variables and rapid fluctuations in biomass (EUR-OCEANS, 2008). Some precautionary measures have been taken to allow the recovery of the stock from adverse environmental conditions, such as closure of the second fishing season in 2014 and lower TAC in second fishing season of 2015.
R4; R9-R10.

A3.2:

The table below (**Table 2**) lists the recommended TAC, actual TAC, and estimated landings for each fishing season from 2013-2017. In the first 2015 season, the TAC was set around 2% higher than recommended, and final landings were estimated to exceed the original advice by around 1.5%. In all other recent years for which data are available, landings have been at or below the advised level.

Although specific harvest control rules are uncertain, it is clear that fishery removals are reduced to reflect estimated biomass, and that they cease entirely when the stock falls below a certain level. One of the FIP objectives is to reduce the uncertainty around the determination of harvest control rules. What is known is that there are euses for controlling landings, self-reporting is also in place fishers are obliged to report to PRODUCE. There are landing limits of one per day. As stated an objective of the FIP is to determine the level of implementation and compliance in the fleet to these harvest control rules. Scientific recommendations, actual quota, and final estimate of landings for anchovy fishery seasons from 2013 – 2017 are summarised (**Table 2**):

Table 2. TAC and Estimated Landings (Peru anchovy fishery) 2013-2017**.** (Source IMARPE)

Season	**IMARPE recommendation**	**Actual TAC**	**Estimated Landings**
2017 1st Season	2,800,000t	2,800,000t	2,370,000t
2016 2nd Season	2,000,000t	2,000,000t	1,730,000t
2016 1st Season	1,800,000t	1,800,000t	917,246t
2015 2nd Season	1,110,000t	1,110,000t	1,083,617t
2015 1st Season	2,520,000t	2,580,000t	2,560,000t
2014 2nd Season	No 2nd season	Fishery remained closed	0t
2014 1st Season	2,530,000t	2,530,000t	1,720,000t
2013 2nd Season	2,304,000t	2,304,000t	Approx. 2,300,000t

R9

A3.3:

IMARPE recommends actions through real-time monitoring of oceanographic conditions, size structure and reproductive conditions of anchoveta during the fishing season. When abundance is lower than historical averages and environmental conditions unstable, intensified monitoring, e.g. extra surveys are requested.

A strong El Niño affected the Peruvian coast during 2015 and early 2016, thus, three hydroacoustic surveys were conducted in 2016. In May, warm unfavourable conditions still remained and low biomass was observed, thus IMARPE recommended delaying the first fishing season. In June, normalization of oceanographic conditions, higher biomass estimates, and wider spatial distribution of the stock allowed IMARPE to recommend the opening of the season.

In 2016, IMARPE recommended localised fishery closures due to the high incidences of juvenile anchovy in the catch. These closures affected holders of all types of licence. An additional measure implemented in the same legislation restricted all vessels to one fishing trip per day throughout the north-central region.

These instances provide strong evidence that in-season advice from scientists is followed closely by fishery managers, even where that advice recommends closure. **R9-R10**
References Please go to reference list at the end of the report
Standard clause 1.3.2.1.3

A4	Stock Status - Minimum Requirements		
	A4.1	The stock is at or above the target reference point, OR IF NOT: The stock is above the limit reference point or proxy and there is evidence that a fall below the limit reference point would result in fishery closure OR IF NOT: The stock is estimated to be below the limit reference point or proxy, but fishery removals are prohibited.	**PASS**
Clause outcome:			**PASS**

Evidence

A4.1

Estimated Biomass (period to 01 April 2018) rose to 10.86 million tons, 33% greater than the average of annual summer surveys undertaken since 1994 and of biomass estimated in 2017 (8.17 million tons). This estimate is also 79% greater than the biomass estimated during the same period in 2017 (7.78 million tons).

The biomass estimate included 35% juveniles. The stock has shown wide spatial distribution and high homogenous density.

A decision table (**R8**) was used to estimate a sustainable level of fishing mortality (F) for the 2018 season based on the announced quota for 2018. This reference point allows for the authorities to determine the level of probability that the stock would fall below the reference biomass level of 5 million tons.

R8

References

Please go to reference list at the end of the report

Standard clause 1.3.2.1.4

FURTHER IMPACTS

The three clauses in this section relate to impacts the fishery may have in other areas. A fishery must meet the minimum requirements of all three clauses before it can be recommended for approval.

F1	Impacts on ETP Species - Minimum Requirements		
	F1.1	Interactions with ETP species are recorded.	PASS
	F1.2	There is no substantial evidence that the fishery has a significant negative effect on ETP species.	PASS
	F1.3	If the fishery is known to interact with ETP species, measures are in place to minimise mortality.	PASS
Clause outcome:			**PASS**

Evidence

F1.1-F1.3

National legislation, based on the IUCN Red List, prohibits the capture of protected species (seabirds, turtles and marine mammals) for commercial purposes. These include the Peruvian Diving Petrel, Humboldt penguins, Guanay cormorants, pelicans, Peruvian booby, green sea turtles, South American sea lions and Southern fur seals. Commercial catch, processing and marketing of small cetaceans is prohibited by a national law since the mid-1990s.

Fishsource reports that the main threat posed by the fishery to ETP species is via a reduction in food availability. Anchovy is an important prey for a range of ETP species. IMARPE highlights the difficulties to predict environmental variability and notes that focus should be on preservation of resilience of key species in the ecosystem, such as anchoveta.

Efforts taken to protect ETP species include the establishment of three major Marine Protected Areas (MPAs), covering a total area of 6,305km^2, the National Reserve System of Guano Islands, Isles and Capes; the Paracas National Reserve; and the San Fernando National Reserve. These areas correspond to IUCN category VI protected areas and represent important refuges for seabirds and marine mammals.

There has been some progress in collecting data on ETP species, the industry has been seen to increasing its commitment on the issue; however key efforts remain necessary for using the data for scientific purposes and also to quantify the impact of the fishery on ETP species.

R13

References

Please go to reference list at the end of the report

Standard clause 1.3.3.1

F2	Impacts on Habitats - Minimum Requirements		
	F2.1	Potential habitat interactions are considered in the management decision-making process.	PASS
	F2.2	There is no substantial evidence that the fishery has a significant negative impact on physical habitats.	PASS
	F2.3	If the fishery is known to interact with physical habitats, there are measures in place to minimise and mitigate negative impacts.	PASS
Clause outcome:			**PASS**

Evidence

F2.1- F2.3

In August 2018 during a meeting of the FIP Working Group IMARPE shared a work plan with the aim of determining trophic needs of the ecosystem in relation to anchovy. The goal of this study is to ensure catch levels of the species are consistent with ecosystem needs. This Working Group comprised representatives of PRODUCE, IMARPE and FIP Co-ordinators SNP (Sociedad Nacional de Pesqueria) y CeDePesca, among others.

The ultimate goal is to improve the implementation of the proposed Action Plan which forms part of the FIP project. The impact of the fishery on by-catch (minimal) and protected species will be investigated as will the impact of the fishery on other components of the ecosystem. At the end of the process the Stakeholders would like to be in a position to apply for Marine Stewardship Council Sustainability Certification.

An observer programme (privately funded) was launched in order to quantify the interaction of the fishing gear with the habitat. Preliminary studies have shown that the impact of the fishery on other species is low.

The Working Group concluded that IMARPE need to engage further in efforts to determining trophic needs of the ecosystem in relation to anchovy. IMARPE have agreed to update a paper first published in 2010 on the relation between anchovy and other ecosystem components. IMARPE are now liaising with a consultant to help them achieve their goals.

There is no direct impact on bottom habitats from purse seine nets unless they are used in waters shallower than the nets height. Industrial vessels, since 2012, can only operate outside 10 nm from the coast.

The aim of the regulation is to protect coastal habitats and breeding zones for several species. Recently, a permanent spatial closure of 3 nm along the Peruvian coastline for all fleets was established.

R13, R21

References

Please go to reference list at the end of the report

Standard clause 1.3.3.2

F3	Ecosystem Impacts - Minimum Requirements		
	F3.1	The broader ecosystem within which the fishery occurs is considered during the management decision-making process.	PASS
	F3.2	There is no substantial evidence that the fishery has a significant negative impact on the marine ecosystem.	PASS
	F3.3	If one or more of the species identified during species categorisation plays a key role in the marine ecosystem, additional precaution is included in recommendations relating to the total permissible fishery removals.	PASS
Clause outcome:			**PASS**

F 3.1- F 3.3:

Several authors have raised concerns about the justification of thresholds used by IMARPE in relation to be quantifying the impact of the fishery on predators of anchovy. Recommendations have been included in the FIP to make improvements in the management system that would allow for explicit catch control rules in the case of low biomass, by March 2020.

Anchovy are highly dependent on environmental events; periodically, the upwelling that drives the Humboldt Current Large Marine Ecosystem's productivity, where the fishery operates, is disrupted by El Niño-Southern Oscillation (ENSO) events.

Spatiotemporal variability affecting anchoveta at different temporal scales has been studied by several authors. During ENSO events, fish abundance and distribution are significantly affected, often leading to stock crashes and cascading social and economic impacts. These events because regime shifts where anchovies; sardines or other LTL species alternate as the dominant species in the ecosystem.

Prolonged warm anomalous conditions since late 2013 have led to higher diversity in the pelagic ecosystem, higher mixture of juvenile and adult organisms in anchovy schools, diet change from euphausiids to copepods), more coastal distribution and increased consumption of anchovy by coastal species due to its greater accessibility.

IMARPE highlights that difficulties to predict environmental variability are more evident in recent years and indicates that focus should be on preservation its resilience by protecting coastal areas, spawning events and juveniles.

However, in recent years, the reporting has been improving, there is no impact on ecosystems caused by purse seine and there are measures in places to protect juveniles that can be involved in the trophic chain of predators considered ETP.

The fishery does not have a high level of bycatch, main species are chub mackerel and jack mackerel. Results of the 2017 observer program showed bycatch volumes were less than 1% and can be considered insignificant.

R6, R10, R11

Standard clause 1.3.3.3

LIST OF REFERENCES

R1 PRODUCE (2012) overview https://www.gob.pe/produce

R2 PRODUCE 2016a: Decreto Supremo N° 024-2016. Establece medidas para fortalecer el control y vigilancia de la actividad extractiva para la conservación y aprovechamiento sostenible del recurso anchoveta. Lima, 15 de noviembre de 2016.
http://busquedas.elperuano.com.pe/download/url/decreto-supremo-que-establece-medidas-para-fortalecer-el-con-decreto-supremo-n-024-2016-produce-1453690-4

R3 IMARPE overview:
http://www.imarpe.pe/imarpe/index.php?id_seccion=I0169000000000000000000

R4 EUR-OCEANS, 2008. Fact Sheet Nº9: Adaptive management in pelagic fisheries. 2 pp. http://pierrefreon.free.fr/PDF/Freon_et_al_EUR-OCEANS_FC_adaptive_management_2008.pdf

R5 FishSource Peru Anchovy profile: https://www.fishsource.org/stock_page/1383

R6IMARPE Reporting (2017): Evaluación del Plan Operativo (Landings data) http://www.imarpe.gob.pe/imarpe/archivos/informes/eval_poi_segundo_trim2017.pdf

R7 IMARPE (March 2015) PROTOCOLO "ESTIMACIÓN DE LA CAPTURA TOTAL PERMISIBLE DEL STOCK SUR DE LA ANCHOVETA PERUANA 3pp
http://www.imarpe.gob.pe/imarpe/archivos/informes/imarpe/protocolo_captu_stok_ancho_sur.pdf

R8 IMARPE (2018) Situacion del stock Norte-Centro de la anchoveta peruana al de abril de 2018 PDF 12pp http://www.imarpe.gob.pe/imarpe/archivos/situacion_stock_anchoveta_10_11_18.pdf

R9 IMARPE, 2014. Informe Análisis Poblacional de la Pesquería de Anchoveta en el Ecosistema Marino Peruano". 38 pp. http://www.imarpe.pe/imarpe/archivos/informes/info_anal_pob_anchov_1.pdf

R10 IMARPE, 2015. Informe complementario sobre la situación del stock norte - centro de la anchoveta peruana a noviembre del 2015. 13 pp.
http://www.imarpe.pe/imarpe/archivos/informes/InfCompSituacionStockN-CAnchovPeruNov2015.pdf

R11 Reglamento de Ordenamiento Pesquero del Recurso Anchoveta para Consumo Humano Directo DECRETO SUPREMO N.º 005-2017-PRODUCE
http://cedepesca.net/wp-content/uploads/2017/05/DS-005-2017-PRODUCE_ROP-anchoveta-CHD.pdf

R12 Peruvian anchovy IHC (Indirect Human Consumption) FIP Progress Update
https://cedepesca.net/wp-content/uploads/2019/03/2019-03_Peruvian-anchovy-IHC-FIP_Progress-Table.pdf

R13 Fishsource Peru anchovy https://www.fishsource.org/stock_page/1383

R14 Convenio de cooperation institutional (IMARPE et la Sociedad Nacional de Pesca (SNP)) pdf 10pp
http://cedepesca.net/wp-content/uploads/2018/04/2017-10_SNP-IMARPE_Convenio-de-Cooperaci%C3%B3n-Interinstitucional.pdf

R15 Fishery Progress: Peru Anchovy FIP: https://fisheryprogress.org/fip-profile/peruvian-anchovy-industrial-purse-seine
R16 MOU (PRODUCE, CeDePesca) pdf 3pphttp://cedepesca.net/wp-content/uploads/2018/04/2018-02_PRODUCE-CeDePesca_Memor%C3%A1ndum-de-Entendimiento.pdf

R17 DL N°1393. Decreto legislativo que regula la interdicción en las actividades ilegales en pesca.

R18 Press Release Peru Fisheries Control**:** https://andina.pe/Ingles/noticia-peru-to-tighten-up-sanctions-against-illegal-fishing-by-foreign-vessels-681077.aspx

R19 Mendo, J.; Wosnitza-Mendo, C. Reconstruction of total marine fisheries catches for Peru: 1950-2010. Fisheries Centre The University of British Columbia Working Paper Series Working Paper #2014 – 21. 24 pp. http://www.seaaroundus.org/doc/publications/wp/2014/Mendo-et-al-Peru.pdf

R20 PRODUCE (2016): Decreto Supremo N° 024-2016. Establece medidas para fortalecer el control y vigilancia de la actividad extractiva para la conservación y aprovechamiento sostenible del recurso anchoveta. Lima, 15 de noviembre de 2016.
http://busquedas.elperuano.com.pe/download/url/decreto-supremo-que-establece-medidas-para-fortalecer-el-con-decreto-supremo-n-024-2016-produce-1453690-4

R21 August 2018 (8pp) Acta de la décima reunión del grupo de trabajo (FIP Plan) https://cedepesca.net/wp-content/uploads/2019/03/2018-08-15_Acta-de-la-d%C3%A9cima-reuni%C3%B3n-del-grupo-de-trabajoborrador.pdf

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.

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