IFFO RS V2.0



FISHERY ASSESSMENT METHODOLOGY AND TEMPLATE REPORT

Fishery Under Assessment	Ecuador Small Pelagic
Date	August 2018
Assessor	Sam Peacock

IFFO RS Ltd, Unit C, Printworks, 22 Amelia Street, London, SE17 3BZ, United Kingdom

Application details and summary of the assessment outcome							
Name:					n	CIDIE	
Address:		2			SIDLE		
Country:		Zip:				N I	
Tel. No.			Fax. No.				
Email address:				Applicant	t Co	de	
Key Contact:				Title:			
Assessment Details							
Name of Assessment B	ody:			RS Stand	ard		
Assessor Name	Peer	Reviewer		Assessme Days	nt	Initial/Surveillance/ Re-approval	Whole fish / By- product
Sam Peacock			N.			Improver Programme	e Whole fish
Assessment Period					М	arch – April 2018	
Scope Details							
Management Authority	y (Cou	ntry/State)			E	cuador	
Main Species				SU	Pa Fi SI Cu Ti Pa Cu Ru Ru	acific chub mackerel igate tuna nortfin scad orbata nread herrings acific anchoveta (chuhu ornetfish ound herring oncador	eco)
Fishery Location					E	cuador EEZ	
Gear Type(s)					Р	urse seine	
Outcome of Assessment							
Clauses where improvements or further inform are required				rmation	N	11, M2, A, F1, F3	

General Results

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

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

Species-Specific Results

Category	Species	% landings	Outo	ome (Pass/Gap)	
			A1	GAP	
	Desifie shuh meskerel	21 40/	A2	GAP	
	Pacific chub mackerei	31.4%	A3	GAP	
			A4	GAP	
	Frigate tuna	18.4%			
Catagon	Shortfin scad	12.6%			
Category A	Corbata	10.8%			
	Thread herrings	8.6%	GAP – see notes		
	Pacific anchoveta (chuhueco)	6.5%			
	Cornetfish	2.8%			
	Round herring	2.7%	-		
	Roncador	1%	1		
Category B	Optional – see section B				
Category C	Jack mackerel	0.3%		PASS	
Category D	Longnose anchovy	0.7%		PASS	
	Pacific harvestfish	0.5%	PASS		
	Drums	0.4%		PASS	

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 byproduct 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 chub mackerel	Scomber japonicus		31.4%	Some	A or B
Frigate tuna	Auxis brachydorax		18.4%		A or B
Shortfin scad	Decapterus macrosoma		12.6%		A or B
Corbata	Trichuuris lepturus		10.8%		A or B
Thread herrings	Opisthonema spp		8.6%		A or B
Pacific anchoveta (chuhueco)	Cetengraulis mysticetus		6.5%		A or B
Cornetfish	Fistularia spp		2.8%		A or B
Round herring	Etrumeus acuminatus		2.7%		A or B
Roncador	Maemulopsis axillaris		1%		A or B
Longnose anchovy	Anchoa nasus		0.7%	No	D
Pacific harvestfish	Peprilus medius		0.5%	No	D
Drums	Larimus spp		0.4%	No	D
Jack mackerel	Trachurus murphyi		0.3%	Yes	С

Categorisation Note: Percentage of landings is calculated as an estimate of the average prevalence in the catch 2012 – 2016. Catch composition shifted substantially in 2012 due to a change in gear regulations. As the new gear regulation is expected to remain in place, the new catch composition is considered the most relevant. See Improver Programme Note 1 for more details.

Improver Programme Note 1:

The IFFO RS fishery assessment process begins with the categorisation of species caught in the fishery using the methodology described above. Full landings data were provided by the applicant breaking the catch down by species or genus for the period 2004 – 2016. However, it was also reported by the applicant that in 2012 a new regulation came into force which increased the minimum mesh size for Ecuadorian purse seiners, resulting in a substantial change in the catch composition in the fishery. For this reason, the categorisation of landings for the purposes of this assessment has used an average of

the landings between 2012 and 2016. There is considerable variation between years and so it is likely that the IFFO RS species list will change over time.

Improver Programme Note 2: This assessment uses the IFFO RS methodology to determine which species are subjected to assessment. There are several other species which have historically seen some small landings in the fishery, but have not been present in significant numbers in recent years. If these species begin to re-appear in the catch, it is possible that they will exceed the 0.1% minimum proportion which will require them to be included in the assessment.

Background Section

1.1 Overview of the fishery

The Ecuadorian small pelagic fishery is economically and socially important for the country. Industrial fishing began in the 1950s, but only began to grow into a substantial activity in the 1970s. Total reported landings reached a peak of nearly 1 million tonnes in the mid-1980s, but in recent years have generally fluctuated between 200,000-300,000t. Catch is heavily influenced by oceanographic and environmental variables, both in terms of total volume but also catch composition. There is extensive evidence to indicate that there is high natural variability in the relative sizes of the stocks targeted by the fishery, and therefore their relative prevalence in landings. Natural variability also affects whether certain species occur in the catch at all.

De la Cuadra (2010) point out that in front of the Equator, the small pelagic fish species landed by the industrial fleet are strongly influenced by the short-term thermal changes that occur in the ocean, such as the warm and cold phase of the ENSO cycle (El Niño / Southern Oscillation). While, Ormaza-Gonzalez et al. (2016), analysing the landings of small pelagic species between 1981 and 2012 and comparing them with different oceanographic indices such as ONI, MEI and PDO, point out that in the long-term fluctuations the small pelagic landings decrease under a warm PDO, and increase of a cold PDO.

In 2016, the small pelagic fishery contributed around 20% of fishery exports (\$ 256 million). Of which, 72% was generated by the fishmeal and fish oil industry, another 28% percent was generated by the exported production for human consumption (canned and frozen fish). According to Ormaza-Gonzalez (2016), the small pelagic fishery generates direct employment in processing plants and fishing fleet for at least 6,975 people, in addition to indirect employment not quantified in the value chain in eviscerating, cutting, unloading, transportation, commercialization, repairs and maintenance of ships and networks, among other activities.

This assessment report uses landings data for the small pelagic fishery for the period 2012-2016 to generate an estimate of 'normal' catch composition, as described in the Species Categorisation section above.

It is important to note that much of the catch are made up of small pelagic species. During the period 2012-2016, on average, 80% of the catches were composed of the species: macarela (Pacific chub mackerel, *Scomber japonicus*); pinchagua (thread herrings, *Opisthonema spp*); Sardine redonda (red-eye round herring, *Etrumeus teres*); chuhueco (Pacific anchoveta, *Cetengraulis mysticetus*); botellita (frigate tuna, *Auxis spp*); and picudillo (Shortfin scad, *Decapterus macrosoma*).



Map of Ecuador and its Exclusive Economic Zone (EEZ)¹.



Total landings in the Ecuador small pelagic fishery by year, 2004-2016².

¹ Alava, Lindop & Jacquest, 2015. Marine fisheries catch reconstructions for continental Ecuador: 1950-2010. <u>http://www.seaaroundus.org/doc/publications/wp/2015/Alava-et-al-Ecuador.pdf</u>



Landings of the nine Type 1 species identified in this report, by year, 2004-2016³.

1.2 Management system

Since May 2017, the government body with responsibility for the management of fisheries in Ecuador is the Ministry of Aquaculture and Fisheries (Ministerio de Acuacultura y Pesca, MAP). The mission of MAP is the regulation and promotion of the use of fisheries and aquaculture based on policies, strategies, standards and technical and legal instruments. The National Fisheries Institute (Instituto Nacional de Pesca, INP) is the government body within MAP responsible for the coordination and conduct of fishery science in support of the management of Ecuadorian fisheries. The INP is a specialised agency dedicated to biological, technological and economic research aimed at the management and development of fisheries. The primary legal instrument in the management of Ecuadorian fisheries is currently the Fisheries and Aquaculture Development Act (Adapted 1974). As of April 2018 a new Law of Fisheries and Aquaculture was in the draft stage. A draft of this legislation was provided by the applicant. If this law passes in its current form, it will have substantial impacts on the administrative structure and management framework of Ecuadorian fisheries, including surveillance and enforcement.

1.3 Target species

The most recent stock assessment for the small pelagic fishery was conducted in 2000 and used data from 1979 to 1998; however this stock assessment exists only in hard copy and is not available online. Additionally, the stock assessment did not cover all of the species categorised as Type 1 by this IFFO RS assessment. The main historical data publically available for the stocks targeted by the fishery are landings data for 1981 – 2016; some other data are available but are generally limited. There is a poor understanding of stock structure for all the species caught in the fishery, with no established reference

² Landings data provided by applicant via email, April 2018.

³ Landings data provided by applicant via email, April 2018.

points and no recent estimates of stock status. Some recommendations made by the INP, such as the creation of an observer programme, mesh size limits, and geographical closures, have been implemented. There are also measures in place which restrict the total level of fishery removals, such as extensive closed periods limiting fishing to 200 days per year, and the prohibition of certain gear types. However these measures have not been demonstrated to restrict total removals or removals of any individual species to a level recommended by scientists (indeed, total landings have gradually increased since 2004), and historically the fishery has not been closed (or subjected to additional restrictions) when a species has been determined by scientists to be overfished.

1.4 Ecosystem and Habitat

Due to the pelagic gear used in the fishery, negative physical habitats impacts are considered limited. Understanding of the impacts of the fishery on the broader ecosystem is limited, although the shifting catch composition over time is understood to reflect changes in species availability which may be driven by the combined effects of fishing activity and oceanographic and environmental variables, more than any of these factors separately. There is no substantial evidence that the potential or actual impacts of the fishery on ecosystems or particularly important or vulnerable species has influenced the management process. There are national plans of action for the conservation of sharks and turtles, and interactions between the fishery and these species are recorded by observers; however the scale and nature of such interactions appears to be poorly understood.

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	Mana	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 publicly committed to sustainability.	PASS					
	M1.4 Fishery management organisations are legally empowered to take management							
		actions.	FA33					
	M1.5	There is a consultation process through which fishery stakeholders are engaged in	DVCC					
		decision-making.	FA33					
	M1.6 The decision-making process is transparent, with processes and results publicly							
		available.	1 433					
		Clause outcome:	PASS					

Evidence

M1.1 – The government body with responsibility for the management of fisheries in Ecuador is the Ministry of Aquaculture and Fisheries (*Ministerio de Acuacultura y Pesca*, MAP)⁴. MAP was separated from the old Ministry of Agriculture, Livestock, Aquaculture and Fisheries (MAGAP) by Executive Decree No. 6 of May 24, 2017⁵. The mission of MAP is the regulation and promotion of the use of fisheries and aquaculture based on policies, strategies, standards and technical and legal instruments. MAP seeks to "guarantee favourable conditions for the increase of productivity, competitiveness and sustainable and sustainable development for the aquaculture and fishing sectors, contributing to the improvement of the quality of life of the Ecuadorians"⁴.

M1.2 – The National Fisheries Institute (*Instituto Nacional de Pesca*, INP) is the government body within MAP responsible for the coordination and conduct of fishery science in support of the management of Ecuadorian fisheries. The INP is a specialised agency dedicated to biological, technological and economic research aimed at the management and development of fisheries. Its mission is "To provide services and advice to the fishery-aquaculture sector through research and scientific-technical evaluation of hydrobiological resources and their ecosystems for their sustainable management"⁶.

M1.3 – Both the MAP and INP list of objectives reference sustainable development. The duties of MAP include, amongst others:

- Increase productivity, competitiveness and sustainable development of the aquaculture and fisheries sectors.
- Increase the quality and safety of aquaculture and fisheries products for domestic consumption and export⁴.

The specific objectives of the INP include:

• Conduct scientific research to improve knowledge of aquatic organisms and their environment in order to assess their potential, diversify production, foster the development of fisheries and achieve optimal

 ⁴ MAP website, "About the Ministry". <u>http://www.acuaculturaypesca.gob.ec/subpesca4644-el-ministerio.html</u>
⁵ Ecuador Executive Decree No. 6, May 24, 2017. <u>http://www.acuaculturaypesca.gob.ec/wp-</u> <u>content/uploads/2017/10/DECRETO-6.pdf</u>

and rational use.

• Provide scientific and technical assistance to research on aquatic resources conducted by other organisations⁶.

Finally, the activities of both MAP and the INP are carried out within the Constitution of the Republic of Ecuador. Article 73 of the Constitution states "The State shall apply precautionary and restriction measures for activities that may lead to the extinction of species, the destruction of ecosystems and the permanent alteration of natural cycles"⁷.

M1.4 – The primary legal instrument in the management of Ecuadorian fisheries is currently the Fisheries and Aquaculture Development Act (Adapted 1974)⁸. This includes:

- Article 11 Creation & empowerment of the National Fisheries Development Board.
- Article 14 Empowers the Ministry of Natural Resources and Energy (now MAP) with the responsibility for directing and implementing fisheries policy.
- Article 16 Creation & empowerment of the Directorate of Fisheries (now MAP)
- Article 17 Creation & empowerment of the National Fisheries Institute

As of April 2018 a new Law of Fisheries and Aquaculture was in the draft stage. A draft of this legislation was provided by the applicant. If this law passes in its current form, it will have substantial impacts on the administrative structure and management framework of Ecuadorian fisheries, including surveillance and enforcement.

M1.5 – Ministerial Agreement 047 of 9 April 2010 sets out the establishment of an intersectoral working group, with membership composed of the public and private sector stakeholders directly affected by the Ministerial Agreement itself and the previous Agreement it modified⁹. There is evidence that this group met to discuss the management process for the fishery¹⁰, however anecdotal reports indicate that this forum has not functioned as planned in recent years. The National Chamber of Fisheries (CNP), an industry group representing much of the Ecuadorian tuna and small pelagic fleets, works closely with government to ensure industry stakeholders' voices are heard¹¹.

M1.6 – There is extensive evidence of communication of the fishery management decision-making process. The intersectoral working group described above ensures key industry stakeholders are kept informed. There is also a considerable amount of information available from the INP and MAP websites. The Organic Law of Transparency and Access to Public Information¹² (Law 24 of May 18th, 2004) is intended to "raise citizen participation and the

⁶ INP website, "About us". <u>http://www.institutopesca.gob.ec/quienes-somos/</u>

⁷ Political Database of the Americas – Constitution of the Republic of Ecuador (English version). http://pdba.georgetown.edu/Constitutions/Ecuador/english08.html

⁸ Ecuador Law of Fisheries and Aquaculture, 1974 (as adapted).

http://oa.upm.es/14340/2/Documentacion/1 Memoria/Ley de Pesca y Reglamento/ley%20de%20pesca%20y %20desarrollo%20pesquero.pdf

⁹ Ministerial Agreement No. 047 (Reform of Ministerial Agreement 018).

http://www.acuaculturaypesca.gob.ec/subpesca332-acuerdo-ministerial-n-047-reforma-al-acuerdo-ministerial-018.html

¹⁰ Evidence of minutes of working group meetings provided by applicant via email, May 2018.

¹¹ CNP, About. <u>https://camaradepesqueria.com/la-camara/#quienessomos</u>

¹² Ley Organica de Transparencia y Acceso a la Informacion Publica, Law 24, 18-May 2004. <u>https://www.educacionsuperior.gob.ec/wp-content/uploads/downloads/2014/09/LOTAIP.pdf</u>

right to access information related to public affairs, to exercise effective control and demand accountability to government institutions or those that perceive state resources"¹³.

Improver Programme Notes

There are clear management and research frameworks in place for Ecuadorian fisheries, with the stated objectives of the management and research bodies clearly setting out sustainability as a core goal. As the new Fisheries and Aquaculture law is still in draft form its contents have largely not been used to inform the outcomes of this IFFO RS assessment; however once passed and implemented it may rapidly lead to improvements in the scores of the fishery against many sections. The fishery improvement timeline should factor in any expected changes as a result of this law change. There are clear mechanisms in place ensuring stakeholder engagement and transparency in the decision-making process. However while the evidence allows for a 'PASS' rating at this time, communications during the application process indicated that some scientific reports may not be made publically available and that the governmental stakeholder engagement mechanism is not currently fully functioning. The applicant should seek to ensure that transparency and stakeholder engagement continue, particularly as new stock assessments and their associated management recommendations are created.

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.							
	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 structure and responsibilities of the Ministry of Aquaculture and Fisheries are set out in Ministerial Agreement 0013 of 2017¹⁴. This Agreement clearly sets out the role of the Department of Fishery Resources Control within MAP, which includes (amongst others):

- Coordination of the execution and management of plans and programmes for the control of fishing activity and its related activities;
- Enforce the current legal regulations within the scope of competence;
- Implement the National Fisheries Control Plan.

The Department is also tasked with producing a range of deliverables, including a manual for fisheries control procedures, a report on the implementation of the National Fisheries Control Plan, and a technical report on control activities carried out by the Department, including an evaluation of their effectiveness.

Enforcement of the regulations and closed areas around the Galapagos Marine Reserve (GMR) is carried out by the Galapagos National Park Service, whose assets include 11 patrol vessels and a four-seat patrol plane¹⁵. The

¹³ MAP website, "Transparency". <u>http://www.acuaculturaypesca.gob.ec/transparencia</u>

¹⁴ Ministerial Agreement No. 0013, "Statuto Organico Por Procesos Ministerio De Acuacultura Y Pesca". Provided by applicant via email, June 2018.

GMR is closed to industrial fishing and is far removed from the areas fished by the small pelagic fleet.

M2.2 – The Fisheries and Fisheries Development Act (1974), as updated in 2016, includes sanctions such as fines, suspension of fishing rights, and the confiscation of catch, fishing gear, or vessels¹⁶. The new fisheries law currently in the draft stage also contains a range of potential sanctions plus VMS monitoring, inspections, on-board observers and image recording systems²⁰.

M2.3 – There was no substantial evidence of widespread non-compliance or IUU activities in the fishery uncovered during the production of this report. A 2005 report by the IUCN stated that "The importance of strengthening Ecuador's capacity to implement and enforce fisheries management and conservation measures has been highlighted by the unsuccessful ban on shark fisheries within the Galapagos Marine Reserve...this consideration applies equally to all fisheries management in Ecuador"¹⁷; however the situation in the country has changed since that time. Evidence was provided by the applicant demonstrating extensive monitoring and enforcement activities, including during closed months, and observer coverage representing around 10% of total landings each year¹⁸.

M2.4 – The 2015 MAP annual report includes a section summarising the activities of the Department of Fishery Resources Control. Enforcement data provided for May to December 2012 indicates the detection of 470 fishing offences, including 36 industrial trawlers not using a Turtle Excluder Device; 101 industrial purse seiners operating within the 8nm no trawl zone; and 67 companies utilising prohibited species in the manufacture of fishmeal¹⁹. The report also indicates the transgressions detected by the Satellite Monitoring Centre (unknown year, presumed 2015), which includes 535 incidences of operating within the 8nm limit, 150 incidences of operating within the 1nm limit, and 36 incidences of operating within closed areas; however anecdotal evidence indicates that the VMS systems have no independent confirmation and are likely to produce many erroneous reports. The section also notes that the sector which commits most infractions detected by the SMC is the small pelagic fleet.

The number of fishing inspectors is noted to have increased from 72 to 255. The report also states that the National Fisheries Control Plan and Fisheries Control Manual were created that year, and therefore does not include any detail on the extent to which they have been implemented.

The new fisheries law currently in the draft stage contains a range of compliance monitoring mechanisms including VMS, inspections, on-board observers and image recording systems²⁰. A 2018 Ministerial Agreement implemented mandatory VMS for all industrial and longliner vessels, regardless of tonnage²¹. A 2010 Ministerial

https://www.iucn.org/sites/dev/files/import/downloads/ecuador_npoa_fowler.pdf

¹⁵ Reef Resilience Network case study: Galapagos Marine Reserve. <u>http://www.reefresilience.org/case-studies/ecuador-fisheries-management/</u>

¹⁶ Ecuador Law of Fisheries and Aquaculture, 1974 (as adapted). <u>http://www.acuaculturaypesca.gob.ec/wp-content/uploads/downloads/2016/12/Reglamento-a-la-Ley-de-Pesca-2016.pdf</u>

¹⁷ Fowler, 2005. The international and national frameworks for conservation and management of sharks, Recommendations for Ecuador.

¹⁸ Data provided by applicant via email, 22 June 2018.

¹⁹ MAP annual report 2015. <u>http://www.acuaculturaypesca.gob.ec/wp-</u>

content/uploads/downloads/2016/07/Informe-de-Gesti%C3%B3n-VMAP.pdf

²⁰ Draft Fisheries and Aquaculture Law provided by applicant via email, April 2018.

²¹ Ministerial Agreement No. MAP-SRP-2018-0104-A, "Expedir Las Normas Y Regulaciones Para La Operación De Los Sistemas De Monitoreo Satelital Dirigidos A Embarcaciones Pesqueras". Provided by applicant via email, June 2018.

Agreement established an onboard observer programme with the objective of covering at least 30% of trips, selected at random²². Information provided by the applicant indicated observer coverage in the small pelagic fishery covering around 10% of landings in 2016, with observers present on a total of 1,774 small pelagic trips that year²³.

Improver Programme Notes

Information on surveillance, control and enforcement in the fishery is good. Fisheries control and enforcement is the responsibility of the Department of Fishery Resources Control within MAP, and extensive evidence of the activities carried out by the Department, and their effectiveness, have been provided. The fishery should continue to publish publically available information on control and enforcement efforts.

²² Ministerial Agreement No. 047 (Reform of Ministerial Agreement 018).

http://www.acuaculturaypesca.gob.ec/subpesca332-acuerdo-ministerial-n-047-reforma-al-acuerdo-ministerial-018.html

²³ Data provided by applicant via email, 22 June 2018.

CATEGORY A SPECIES

Type 1 species may be assessed using either Category A or Category B. For a species to pass an assessment using Category A, there must be regular stock assessments which are based on reliable data, and which produce an estimate of the current state of the resource and an appropriate level of fishery removals. There must also be a mechanism in place by which the total removals are limited to the level recommended by the stock assessment. The Category B assessment is designed to allow fisheries with a less complete stock assessment process to demonstrate responsible management through a risk-based approach, whereby a species may be approved if the available data indicate that the fishery is not putting it at substantial risk of over-exploitation. As it is a risk-based approach, Category B is more conservative than the Category A assessment.

Fisheries applying to the IFFO RS Improver Programme therefore have a choice as to whether to set Category A or Category B as the objective for the improvement plan for each Type 1 species. The species categorisation process carried out at the start of this assessment identified a total of nine Type 1 species in the Ecuadorian small pelagic fishery. As there have been no recent stock assessments conducted for any of these, none would currently pass a Category A assessment. To avoid repeating the same conclusion nine times, this report provides a full Category A assessment of the most well-understood stock (the Pacific chub mackerel), followed by a summary of the available information for the other Type 1 species. However, the majority of the advice provided for Pacific chub mackerel (under each section as "Improver Programme Notes") will be equally applicable to the other Type 1 species, should a Category A approach be applied.

Each of these species, including Pacific chub mackerel, could alternatively be put through a Category B assessment. This option is considered in more detail in Section B below.

Species Name		Name	Pacific Chub Mackerel (Macarela)		
Α1	Δ1 Data Collection - Minimum Requirements				
	A1.1	Landings known.	data are collected such that the fishery-wide removals of this species are	GAP	
	A1.2	Sufficient estimate	t additional information is collected to enable an indication of stock status to be d.	GAP	
			Clause outcome:	GAP	
E di al a					

Evidence

A1.1 – The last stock assessment was conducted in 2000 and used data from 1979 to 1998^{24} ; however this stock assessment does not appear to be available online. Regular scientific surveys are not conducted²⁵. The main historical data publically available for the stock is landings data for 1981 - 2016; some other data are available (seeA1.2). There are several potential situations for the stock structure of Pacific chub mackerel off the coast of Ecuador, with some sources suggesting a single, distinct stock in Ecuador while others concluding there may be considerable overlap with chub mackerel in Peruvian waters²⁵.

²⁴ Cucalón-Zenck, E., J. Chavarria, L. Maridueña, Y. de Maridueña, E. Cavezas, D. Burgos, E. Zambrano, and P. Avila. 2000. La Macarela (Scomber japonicus) en Ecuador, su Biologia, Pesqueria, Dinamica Poblacional y Manejo. Boletín Científico Técnico 18(1):1-56.

²⁵ Fishsource chub mackerel page: <u>https://www.fishsource.org/stock_page/2280</u>



Spatial distribution of Pacific chub mackerel capture in Ecuador in 2013²⁶.

A1.2 – There is some evidence of size sampling being conducted, with a 2014 INP technical report stating that 68% of landed individuals were below the average size at sexual maturity (28cm)²⁷. A second source, published in an unknown year but covering the period 1981-2007, includes a detailed analysis of the size frequency distribution of Pacific chub mackerel in each year from 1998 to 2007²⁸. Reports were also produced by the INP summarising the small pelagic fishery for 2008²⁹ and 2009³⁰. Taken together these sources suggest that size frequency data for the species may exist for recent years, and potentially also other species-specific data. However, some sources note that the Small Pelagic Fisheries Program, under which all of these reports were produced, is hampered by limited funding³¹, and therefore the existence of recent data is not guaranteed.

A 2018 hydroacoustic research cruise produced a total estimated biomass for Pacific chub mackerel of 265,714t,

https://www.gob.mx/cms/uploads/attachment/file/192271/Gilbert y_Villegas_2016.pdf ²⁷ INP small pelagic fishery technical report, June 2014. <u>http://institutopesca.gob.ec/wp-</u>

content/uploads/2017/07/Junio-2014.pdf

²⁶ Gilbert-Jaramillo & Villega-Tigrero, 2016. Aspectos biológicos y pesqueros de la macarela *Scomber japonicus* (Perciformes: Scombridae) en la costa continental de Ecuador.

²⁸ INP report, "Analysis of the small pelagic fishery resources in Ecuador (1981-2007). <u>http://institutopesca.gob.ec/wp-content/uploads/2017/07/Peces-pel%C3%A1gicos-peque%C3%B1os-1981-</u>

^{2007.}pdf

²⁹ Prado, M. 2009. La Pesquería de Peces Pelágicos Pequeños en el Ecuador durante el 2008. Boletín Científico y Técnico:1-25.

https://www.researchgate.net/publication/305457315 La Pesqueria de Peces Pelagicos Pequenos en el Ec uador_durante_el_2008

³⁰ González, N. 2010. La pesquería de peces pelágicos pequeños en ecuador durante 2009. Boletín Científico y Técnico 20(7):1-17. <u>http://www.oceandocs.org/bitstream/handle/1834/4791/1.%20PPP-ANUAL%202009-</u> <u>Natalia.pdf?sequence=1</u>

³¹ Fishsource chub mackerel page: <u>https://www.fishsource.org/stock_page/2280</u>

along with associated biological characteristics such as length and weight data. This appears to have been the first such survey since 1990, although as noted above there may be other data not publically available. The 2018 survey also estimated the biomass of other commercially targeted small pelagic species, with the total combined biomass of frigate tuna, chub mackerel, shortfin scad, pacific thread herring, scad mackerel and pacific anchoveta (chuhueco) estimated to be 1,396,223t (see the species sections below for individual biomass estimates). The 1990 survey estimated the total biomass to be 2.4 million tons³².

Improver Programme Notes

There is evidence of a range of species information being collected at various times, although there is little data publically available beyond landings estimates in recent years. Overall the fishery is very close to achieving a Pass rating against A1.1, due to the extensive landings record, but the lack of clarity on stock structure currently means a Gap is appropriate.

Standard clause 1.3.2.1.1

Α2	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.	GAP					
	A2.2	The assessment provides an estimate of the status of the biological stock relative to a reference point or proxy.	GAP					
	A2.3	The assessment provides an indication of the volume of fishery removals which is appropriate for the current stock status.	GAP					
	A2.4	The assessment is subject to internal or external peer review.	GAP					
	A2.5	The assessment is made publically available.	GAP					
		Clause outcome:	GAP					

Evidence

A2.1 – No full stock assessment has been conducted since 2000, although some summary reports have been produced since that time, in 2008 and 2009^{25} . The details of the 2000 stock assessment do not appear to be available online. Notwithstanding the uncertainty in stock structure, it is likely that all fishery removals were included in the assessment as these data are available for the period.

A2.2 – There are no reference points established for chub mackerel²⁵. It is possible that reference points were recommended in the 2000 stock assessment; however if this is the case there is no evidence that these have been used since that time to indicate the status of the stock. Secondary sources indicate that the 2000 stock assessment estimated the stock biomass to be 274,690t, with $F = 0.74^{25}$. The stock assessment concluded that the biomass was undergoing a rapid decline and was overfished; however there was no comparison of the stock status to reference points. The 2018 stock assessment estimated that total biomass was 265,714t, suggesting that the population is currently at similar levels to 2000.

A2.3 – The 2009 summary report does include recommendations for the management of the fishery, but these do not include an indication of the volume of fishery removals which would be appropriate for the stock. Although based on analysis of individual species, the recommendations are general to the small pelagic fishery as

³² INP hydroacoustic cruise report, "Estimación Hidroacústica De La Abundancia Y Biomasa De Los Principales Peces Pelágicos Pequeños En El Ecuador Y Su Distribución Geoespacial, Durante Marzo De 2018". Provided by applicant via email, June 2018.

a whole (although no recommendation for total removals of all species is made).

A2.4 – The 2000 stock assessment appears to have been published in a peer reviewed journal, as do the majority of the other technical reports referenced here. Although the fishery has not been subjected to a stock assessment sufficiently recently to meet the other requirements of this section, the process by which similar documentation is developed indicates that this clause will be met once such a stock assessment becomes available.

A2.5 – The 2000 stock assessment is not available online but is available in hard copy in the INP library. The 2008 and 2009 summary reports are available^{29,30}, as are the other technical reports referenced in section A1.

Improver Programme Notes

The most recent full stock assessment for the fishery was conducted in 2000, and does not appear to be publically available. Although the availability does impact the scores in this section, it is primarily the lack of a recent stock assessment which results in Gap ratings throughout. In order to pass this section, there must be a regular stock assessment conducted which produces an estimate of the current status of the stock relative to a reference point or proxy, and it must also include a recommendation for total fishery removals. Based on the other documentation available from the INP website, it seems likely that once such a stock assessment exists, it will be peer reviewed and available online, thus meeting A2.4 and A2.5.

Standard clause 1.3.1.2, 1.3.2.1.2, 1.3.2.1.4

A3	3 Harvest Strategy - Minimum Requirements						
	A3.1	There is a mechanism in place by which total fishing mortality of this species is restricted.	GAP				
	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.	GAP				
	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).	GAP				
		Clause outcome:	GAP				

Evidence

A3.1 – There are no catch quotas in place, either for Pacific chub mackerel or for the small pelagic fishery as a whole.²⁵ Removals are influenced by closed seasons (totalling 200 closed days per year), closed areas and a minimum mesh size of 1.125 inches³³, but these do not appear to restrict total removals to a particular level and are not adjusted to reflect changing stock status. Total fishery removals have shown a consistent upward trend in recent years, from 175,947t in 2004 to 380,292t in 2016.

A3.2 – There do not appear to be any recommendations in the historical stock assessments as to an appropriate level of total removals for the species, but the stock has been reported as overfished on two occasions²⁵. There is a clear link between scientific advice and management, with the majority of INP technical recommendations adopted in recent years²⁵. There is currently no minimum landing size in place despite this being the scientific advice.

³³ Ministerial Agreement No. 047 (Reform of Ministerial Agreement 018) <u>http://www.acuaculturaypesca.gob.ec/subpesca332-acuerdo-ministerial-n-047-reforma-al-acuerdo-ministerial-018.html</u>

A3.3 – Although there are no reference points established for the stock, there is evidence that falling below any reference points would not lead to fishery closure to permit recovery. The stock has been reported to be overfished on two occasions, with no closure response from managers.

Improver Programme Notes

The scientific advice generally appears to be reflected in the actions of managers. Recommendations from scientific reports, such as a stock assessment report, should continue to be implemented by managers. Of particular relevance to this section, in order to achieve a Pass rating the total fishing mortality of Pacific chub mackerel should be limited to a level indicated by scientists to be appropriate. This could be achieved via a quota system, but also further temporal, spatial or licencing restrictions if these can be shown to achieve the desired result.

Standard clause 1.3.2.1.3

Δ4	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:	GAP					
		The stock is estimated to be below the limit reference point or proxy, but fishery removals are prohibited.						
		Clause outcome:	GAP					

Evidence

A4.1 – The conclusion of the 2000 stock assessment was that the species was undergoing a rapid decline and was overfished; there do not appear to have been any management measures applied since that time with the express intention of allowing biomass to recover²⁵, and total landings in the fishery have shown a relatively consistent upward trend since 2004. There is no other evidence to suggest that the fishery would be closed if Pacific chub mackerel biomass was determined to be at low or very low levels. However, Ministerial Agreement No. 183 of 28 November 2011 does empower the Undersecretary of Fishery Resources (now MAP) to implement "additional closures on the pinchagua [thread herring] resource", and therefore on the small pelagic fishery as a whole³⁴.

Improver Programme Notes

This clause can only be met once reference points or proxies have been established for the stock. There is considerable overlap between this clause and A3.3, to the extent that once A3.3 is met this clause will likely also be met. The intent of this clause is to permit stocks which are currently below their limit reference points to remain IFFO RS approved on the condition that fishery removals are prohibited.

³⁴ Ministerial Agreement No. 183 (Pinchagua and Chuhueco).

http://www.acuaculturaypesca.gob.ec/subpesca90-acuerdo-ministerial-n-183-pinchagua-y-chuhueco.html

Other Type 1 Species

As noted at the start of this section, there are a total of nine Type 1 species which must be assessed using either Category A or Category B. The following is a summary of the current stock assessment and data collection measures in place for the other Type 1 species in the Ecuadorian small pelagic fishery. As noted above, none of these species would currently be approved via a Category A assessment.

For the majority of the species below, the only main data available appears to be landings data. However, there is some evidence that some additional data collection and analysis was conducted during the first half of 2014, as the INP makes summary technical reports available for some months in this period. These reports include an indication of total landings, the locations where removals were made, and comments relating to size sampling of landed fish. More recent examples of these reports, or similar content covering entire fishing seasons, would be useful for improving the level of detail in this IFFO RS fishery assessment³⁵. A more historical source, a paper published by the INP analysing small pelagic landings between 1981 and 2007, indicates that size frequency data are available for Pacific chub mackerel, thread herrings, Pacific anchoveta (chuhueco), frigate tuna, and red-eye round herring for the period 1999-2007³⁶. It is not clear whether similar data have been collected in the interim, but taken together these two sources suggest that there may be more information available for the 'main' species in the small pelagic fishery than have been published on government websites.

Finally, there may be additional species-specific information in the 2000 stock assessment references throughout the Category A assessment of Pacific chub mackerel; however as the full text of this document does not appear to be publically available, it has not been possible to factor it into the following summaries.

Frigate tuna (Botella, 18.4% of landings 2012-2016)

There is limited information available on stock structure of frigate tuna (*Auxis brachydorax*) off the Ecuadorian coast, and no stock assessment has been conducted. There are no reference points established for the species in Ecuadorian waters³⁷. The main data available in relation to the species is landings data. Total landings in the small pelagic fishery in 2016 were 51,905t³⁸. A 2018 hydroacoustic cruise estimated total biomass to be around 631,771t³⁹, and provided biological characteristics and an indication of geographical distribution.

Shortfin scad (Picudillo, 12.6% of landings 2012-2016)

There is limited evidence of any stock assessment or stock structure analysis of shortfin scad (*Decapterus macrosoma*) in Ecuadorian waters. There is no evidence of any reference points

³⁶ INP report, "Analysis of the small pelagic fishery resources in Ecuador (1981-2007). <u>http://institutopesca.gob.ec/wp-content/uploads/2017/07/Peces-pel%C3%A1gicos-peque%C3%B1os-1981-2007.pdf</u>

³⁵ INP small pelagic fishery technical report, June 2014. <u>http://institutopesca.gob.ec/wp-content/uploads/2017/07/Junio-2014.pdf</u>

³⁷ Fishsource page, Frigate tuna in Ecuador. <u>https://www.fishsource.org/stock_page/2255</u>

³⁸ Landings data provided by applicant via email, April 2018.

³⁹ INP hydroacoustic cruise report, "Estimación Hidroacústica De La Abundancia Y Biomasa De Los Principales Peces Pelágicos Pequeños En El Ecuador Y Su Distribución Geoespacial, Durante Marzo De 2018". Provided by applicant via email, June 2018.

established for the species. The main data available appear to be landings data. Total landings in the small pelagic fishery in 2016 were 76,742t³⁸. A 2018 hydroacoustic cruise estimated total biomass to be around 101,211t⁴⁰, and also provided biological characteristics and an indication of geographical distribution.

Corbata (10.8% of landings 2012-2016)

Corbata (*Trichiurus lepturus*, largehead hairtail or beltfish) is distributed globally. There is no evidence of any analysis of stock structure or stock assessment activities for corbata in Ecuadorian waters. There do not appear to be any established reference points or indications of stock status. The only data available appear to be landings data. Total landings in the small pelagic fishery in 2016 were 57,464t, although landings vary considerably from year to year³⁸.

Thread herrings (Pinchagua, 8.6% of landings 2012-2016)

Thread herrings in Ecuador are grouped together in landings data under the name "Pinchagua". At least one species of Ecuadorian thread herring is categorised as Vulnerable by the IUCN (the Galapagos thread herring, *Opisthonema berlangai*)⁴¹; however its distribution is limited to the Galapagos Islands⁴² and DOES NOT OVERLAP with the area in which the small pelagic fishery is conducted, therefore it does not need to factor into the improvement plan. A 1992 paper estimated the total biomass in Ecuadorian waters at the time to be around 2 million tonnes⁴³. A 2018 hydroacoustic cruise estimated total biomass to be around 114,814t⁴⁴, and provided biological characteristics and an indication of geographical distribution. Recent data appear to be mainly limited to landings data, with total landings in the small pelagic fishery in 2016 of 11,586t³⁸. Size sampling conducted in June 2014 indicated that 61% of thread herring caught at that time were under the size at sexual maturity (21.6cm); it is not clear whether more extensive records of size sampling efforts exist³⁵.

In 2001 a seasonal closure was established prohibiting thread herring removals during March and September. Via the same Ministerial Agreement, the direct use of any *Opisthonema* species in the manufacture of fishmeal was prohibited, although by-products from processing for human consumption are permissible⁴⁵. In order to ensure the quality of the catch, fishing of thread herring by vessels without refrigeration equipment or insulated iced storage areas is prohibited.

Pacific anchoveta (Chuhueco, 6.5% of landings 2012-2016)

⁴⁵ Ministerial Agreement No. 183 (Pinchagua and Chuhueco).

http://www.acuaculturaypesca.gob.ec/subpesca90-acuerdo-ministerial-n-183-pinchagua-y-chuhueco.html

⁴⁰ INP hydroacoustic cruise report, "Estimación Hidroacústica De La Abundancia Y Biomasa De Los Principales Peces Pelágicos Pequeños En El Ecuador Y Su Distribución Geoespacial, Durante Marzo De 2018". Provided by applicant via email, June 2018.

⁴¹ Galapagos thread herring species page, IUCN red list. <u>http://www.iucnredlist.org/details/183720/0</u>

⁴² Galapagos thread herring distribution map, IUCN. <u>http://maps.iucnredlist.org/map.html?id=183720</u>

⁴³ Patterson & Santos, 1992, "The thread-herrings *Opisthonema spp*. Off Ecuador: review and population dynamics. <u>https://www.sciencedirect.com/science/article/pii/016578369290037T</u>

⁴⁴ INP hydroacoustic cruise report, "Estimación Hidroacústica De La Abundancia Y Biomasa De Los Principales Peces Pelágicos Pequeños En El Ecuador Y Su Distribución Geoespacial, Durante Marzo De 2018". Provided by applicant via email, June 2018.

Distributed in the eastern Pacific from Baja California to northern Peru, the stock structure of Pacific anchoveta (*Cetengraulis mysticetus*) in Ecuadorian waters, and how this stock structure relates to fisheries in neighbouring countries, is not known⁴⁶. There is limited evidence of any stock assessment activities being conducted in Ecuadorian waters, or of any reference points of indications of stock status. The main available data are landings data. Total landings in the small pelagic fishery in 2016 were 42,377t, although landings vary considerably year-on-year³⁸. In 1988 a seasonal closure was introduced prohibiting removals of Pacific anchoveta between December and May each year⁴⁷. In 2001 a similar order prohibited removals from January to June; this seasonal closure was re-iterated by Ministerial Agreement in 2010⁴⁸. A 2018 hydroacoustic cruise estimated total biomass to be around 189,993t⁴⁹, and also provided biological characteristics and an indication of geographical distribution.

Cornetfish (Trompeta, 2.8% of landings 2012-2016)

Bluespotted cornetfish (*Fistularia commersonii*) and Pacific cornetfish (*F. corneta*) are grouped together in the landings data under the name "Trompeta". Both species are widely distributed, but there do not appear to be any studies examining stock structure in Ecuadorian waters. There is also no evidence of any stock assessments, indications of stock status, or reference points. The only available data appear to be landings data, with combined landings of the two species in the small pelagic fishery in 2016 of 19,559t. Landings are generally lower than this, with the species making up a small proportion of the catch until the gear restriction changes in 2012 and averaging around 6,000t between 2012-2015³⁸.

Round herring (Sardina Redonda, 2.7% of landings 2012-2016)

Red-eye round herring (*Etrumeus acuminatus*) is poorly understood in Ecuadorian waters. The stock structure is not known, and there is limited evidence of any stock assessment, reference points, or indications of stock status⁵⁰. The main available data are landings data. Total landings in the small pelagic fishery in 2016 were 4,919t³⁸. A 2018 hydroacoustic cruise estimated total biomass to be around 92,717t⁵¹, and also provided biological characteristics and an indication of geographical distribution.

Roncador (1% of landings 2012-2016)

Roncador (*Maemulopsis axillaris*) represented an average of 1% of the total landings in the small pelagic fishery since 2012. There does not appear to be any stock assessment activity for the species, nor is there an indication of reference points or stock status. Total landings in the small pelagic fishery in 2016 were around 13,635t, but previous years indicated a maximum of 546t per year³⁸.

⁴⁶ Fishsource page, Pacific anchoveta in Ecuador. <u>https://www.fishsource.org/stock_page/1490</u>

 ⁴⁷ INP website, Small Pelagic Fishery overview. <u>http://www.institutopesca.gob.ec/peces-pelagicos-pequenos/</u>
⁴⁸ Ministerial Agreement No. 047 (Reform of Ministerial Agreement 018)

http://www.acuaculturaypesca.gob.ec/subpesca332-acuerdo-ministerial-n-047-reforma-al-acuerdo-ministerial-018.html

⁴⁹ INP hydroacoustic cruise report, "Estimación Hidroacústica De La Abundancia Y Biomasa De Los Principales Peces Pelágicos Pequeños En El Ecuador Y Su Distribución Geoespacial, Durante Marzo De 2018". Provided by applicant via email, June 2018.

⁵⁰ Fishsource page, red-eye round herring in Ecuador. <u>https://www.fishsource.org/stock_page/1690</u>

⁵¹ INP hydroacoustic cruise report, "Estimación Hidroacústica De La Abundancia Y Biomasa De Los Principales Peces Pelágicos Pequeños En El Ecuador Y Su Distribución Geoespacial, Durante Marzo De 2018". Provided by applicant via email, June 2018.

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Category B species are those which make up greater than 5% of landings in the applicant raw material, but which are not subject to a species-specific research and management regime sufficient to pass all Category A clauses.

Category B species are assessed using a risk-based approach. The following process should be completed once for each Category B species.

If there are estimates of biomass (B), fishing mortality (F), and reference points

It is possible for a Category B species to have some biomass and fishing mortality data available. When sufficient information is present, the assessment team should use the following risk matrix to determine whether the species should be recommended for approval.

Biomass is above MSY / target reference point	Pass	Pass	Pass	Fail	Fail
Biomass is below MSY / target reference point, but above limit reference point	Pass, but re-assess when fishery removals resume	Pass	Fail	Fail	Fail
Biomass is below limit reference point (stock is overfished)	Pass, but re-assess when fishery removals resume	Fail	Fail	Fail	Fail
Biomass is significantly below limit reference point (Recruitment impaired)	Fail	Fail	Fail	Fail	Fail
	Fishery removals are prohibited	Fishing mortality is below MSY or target reference point	Fishing mortality is around MSY or target reference point, or below the long-term average	Fishing mortality is above the MSY or target reference point, or around the long-term average	Fishing mortality is above the limit reference point or above the long-term average (Stock is subject to overfishing)

Table B(a) - F, B and reference points are available

If the biomass / fishing pressure risk assessment is not possible

Initially, the resilience of each Category B species to fishing pressure should be estimated using the American Fisheries Society procedure described in Musick, J.A. (1999). This approach is used as the resilience values for many species and stocks have been estimated by FishBase, and are already available online. For details of the approach, please refer to Appendix A. Determining the resilience provides a basis for estimating the risk that fishing may pose to the long-term sustainability of the stock. Table B(b) should be used to determine whether the species should be recommended for approval.

Table B(b) - No reference points available. B = current biomass; B_{av} = long-term average biomass; F = current fishing mortality; F_{av} = long-term average fishing mortality.

$B > B_{av}$ and $F < F_{av}$	Pass	Pass	Pass	Fail
$B > B_{av}$ and F or F_{av} unknown	Pass	Pass	Fail	Fail
$B = B_{av}$ and $F < F_{av}$	Pass	Pass	Fail	Fail
B = B _{av} and F or F _{av} unknown	Pass	Fail	Fail	Fail
$B > B_{av}$ and $F > F_{av}$	Pass	Fail	Fail	Fail
B < B _{av}	Fail	Fail	Fail	Fail
B unknown	Fail	Fail	Fail	Fail
Resilience	High	Medium	Low	Very Low

Assessment Results

Spec	cies Name	
B1	Species Name	
	Table used (Ba, Bb)	
	Outcome	
Evider	nce	

Improver Programme Notes

Category B is designed to enable fishery managers to demonstrate that stocks for which limited information is available are being responsibly managed through the use of the precautionary approach. The most straightforward way to pass Category B is via Table Ba, which demands a stock to be maintained at or above an established target reference point or proxy, and with fishing mortality at or below MSY. In the case of the species in the Ecuador small pelagic fishery, there are no established reference points, and so the stock must be assessed against the more conservative Table Bb. As noted above, to pass Table Bb the stock must have biomass at or above the long-term average, with fishing mortality below the long term average. Therefore the small pelagic fishery again does not meet the requirements, as estimates of these variables are not available.

It is important to note that passing via Table Bb is only ever temporary, as it is not possible to maintain biomass above the long-term average indefinitely. Therefore any fishery intending to maintain approval against the IFFO RS requirements using Section B must aim to establish biomass and fishing mortality reference points, and may find that meeting the Category A requirements becomes feasible.

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		Name	Jack Mackerel			
C1	Category C Stock Status - Minimum Requirements					
	C1.1	Fishery re	emovals of the species in the fishery under assessment are included in the stock	DVCC		
	assessment process, OR are considered by scientific authorities to be negligible.					
	C1.2 The species is considered, in its most recent stock assessment, to have a biomass above					
		the limit i	reference point (or proxy), OR removals by the fishery under assessment are	PASS		
		considere	ed by scientific authorities to be negligible.			
			Clause outcome:	PASS		

Evidence

C1.1 – In most years jack mackerel makes up less than 2% of the total landings in the Ecuadorian small pelagic fishery, although in 2011 in represented 30%. In general, the fishery lands less than 5,000t of jack mackerel per year, while the provisional target biomass reference point for the stock is 5.5 million tonnes⁵². There is therefore a strong argument for landings in the Ecuadorian fishery being negligible in relation to the size of the stock, with the exception of 2011. An international agreement set the total regional catch at 443,000t in 2016.

C1.2 – Current fishing mortality is estimated to be well below possible F_{MSY} levels⁵². Spawning biomass in 2016 was estimated to be 4.1 million tonnes⁵³. Although no limit reference point is established, this biomass estimate did equate to a total catch recommendation of 493,000t, which was itself estimated would lead to a total biomass of 5.2 million tonnes in 2017.

Improver Programme Notes

Although there are some sources of uncertainty, it is likely that jack mackerel would pass an assessment as a Category C species. The stock appears, based on stock assessments, to be in good condition and the Ecuadorian catch is relatively small compared to the international fishery.

Standard clauses 1.3.2.2

⁵² Fishsource Jack Mackerel page: <u>https://www.fishsource.org/fishery_page/3720</u>

⁵³ 2016 jack mackerel stock assessment: <u>https://www.sprfmo.int/assets/Meetings/Meetings-2013-plus/SC-</u> Meetings/4th-SC-Meeting-2016/SC04-report/SC-04-tech-annex-7.pdf

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.

1	Species Name	Longnose anchovy	
	Productivity Attribu	te	Score
	Average age at maturity (years)	<2	1
	Average maximum age (years)	<10	1
	Fecundity (eggs/spawning)	>10,000	1
	Average maximum size (cm)	<60cm	1
	Average size at maturity (cm)	<30cm	1
	Reproductive strategy	Broadcast spawner	1
	Mean trophic level	>3.25	3
		Average Productivity Score	
	Susceptibility Attribute Value		Score
	Overlap of adult species range with fi	shery <25% of the stock	1
	Distribution	Throughout region	1
	Habitat	Pelagic	3
	Depth range	High overlap	3
	Selectivity	Targeted	3
	Post-capture mortality	Retained	3
		Average Susceptibility Score	2.33
		PSA Risk Rating (From Table D3)	PASS
Γ		Compliance rating	PASS

References

Fishbase species page, Anchoa nasus: https://www.fishbase.de/summary/Anchoa-nasus.html

IUCN Red List species page, Anchoa nasus: http://www.iucnredlist.org/details/183657/0

Improver Programme Notes

Category D species are those which make up a small proportion of the catch and are not subjected to a speciesspecific management regime. This means that they generally do not have established reference points and stock assessments are generally not conducted. In order to risk-assess these species and identify which, if any, are particularly vulnerable, a Productivity Susceptibility analysis is conducted. Species which are identified as Vulnerable according to the outcomes of this analysis are subjected to additional scrutiny via Table D4.

Longnose anchovy achieves scores in the PSA which mean it does not need to be subjected to further examination via Table D4.

D1	Species Name	Pacific harvestfish	
	Productivity Attribu	te	Score
	Average age at maturity (years)	<2 years*	1
	Average maximum age (years)	<10 years*	1
	Fecundity (eggs/spawning)	>10,000	1
	Average maximum size (cm)	<60cm	1
	Average size at maturity (cm)	<30cm	1
	Reproductive strategy	Broadcast spawner	1
	Mean trophic level	>3.25	3
		Average Productivity Score	1.28
	Susceptibility Attrib	ute Value	Score
	Overlap of adult species range with fi	shery <25%	1
	Distribution	Limited regional	2
	Habitat	Pelagic – highly likely	3
	Depth range	High overlap	3
	Selectivity	Targeted	3
	Post-capture mortality	Retained	3
		Average Susceptibility Score	2.5
		PSA Risk Rating (From Table D3)	PASS
		Compliance rating	PASS

References

Fishbase species page, Peprilus medius: <u>http://www.fishbase.org/summary/14139</u>

IUCN Red List, Peprilus medius: http://www.iucnredlist.org/details/183339/0

José lannacone, Lorena Alvariño Flores (2008). *Influence of the size and sex of* Peprilus medius (*peters*) (*stromateidae: perciformes*) captured in Chorrillos, Lima, Peru, on their parasitic community. Neotropical Helminthology, ISSN-e 1995-1043, Vol. 2, No. 2, 2008, pgs. 62-71

*Age data taken from *Peprilus burti*; Murphy, M.D., and Chittenden, M.E. Jr. *Reproduction, age and growth, and movements of the Gulf butterfish* Peprilus burti. United States: N. p., 1991.

Improver Programme Notes

Pacific harvestfish achieves scores in the PSA which mean it does not need to be subjected to further examination via Table D4.

1	Species Name	Drums	
ĺ	Productivity Attribu	te	Score
Ī	Average age at maturity (years)	<2	1
	Average maximum age (years)	<10	1
Ī	Fecundity (eggs/spawning)	>10,000	1
	Average maximum size (cm)	<60cm	1
	Average size at maturity (cm)	<30cm	1
	Reproductive strategy	Broadcast spawner	1
	Mean trophic level	>3.25	3
		Average Productivity S	core 1.28
	Susceptibility Attrib	ute Value	Score
	Overlap of adult species range with fi	shery Unknown species	3
	Distribution	Unknown species	3
	Habitat	Benthopelagic	2
ſ	Depth range	Medium overlap	2
F	Selectivity	Species >2 times mesh si	ze 3
ſ	Post-capture mortality	Retained	3
		Average Susceptibility S	core 2.67
		PSA Risk Rating (From Table	D3) PASS
		Compliance ra	ating PASS

References

Fishbase species page, *Larimus pacificus*: <u>http://www.fishbase.org/summary/14009</u> Fishbase species page, *Larimus argenteus*: <u>http://www.fishbase.org/summary/14014</u>

Improver Programme Notes

The individual species captured in the fishery are not known, therefore the scoring in this section relies on general characteristics of *Larimus* species present in Ecuadorian waters. Where the species is likely to have a significant impact on the score, a value of 'unknown' has been entered and a score of 3 awarded; therefore the scores above should be considered conservative values.

Barriga juma achieves scores in the PSA which mean it does not need to be subjected to further examination via Table D4. However due to the uncertainty in the species specificity and the closeness of the results to a score which would require further examination, it is recommended that the fishery improvement plan considers barriga juma in more detail.

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 or<br="" size="">>5 m length</mesh>
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.

D3		Average Susceptibility Score			
		1 - 1.75	1.76 - 2.24	2.25 - 3	
Average	1 - 1.75	PASS	PASS	PASS	
Productivity Score	1.76 - 2.24	PASS	PASS	TABLE D4	
	2.25 - 3	PASS	TABLE D4	TABLE D4	

D4	Spe	cies Name	N/A				
	Impa	Impacts On Species Categorised as Vulnerable by D1-D3 - Minimum Requirements					
	D4.1	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	D4.2 There is no substantial evidence that the fishery has a significant negative impact on the species.					
			Outcome:				
EVIGE	Evidence						
Impr	over Pr	ogramme Notes					
As no not a infor asses	oted ab appear mation sments	ove, based on the to be any species changes, it is pos s.	available catch composition data and the outcomes of the PSA analyses, s which require further examination via Table D4. If catch compositio ssible that species may need to be assessed using this Table in future	there do n or PSA e IFFO RS			

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

Evidence

F1.1 – It does not appear to be a legal requirement to report interactions with ETP species. Fisheries observers from the INP reported three turtles captured in 10 fishing trips in 2007, potentially suggesting a high rate of interaction (although all three were released alive)⁵⁴; however the rate of interactions across the entire fleet has not been formally analysed or quantified. There was no information on which species of turtle interact with pelagic vessels, or any further information on rates of turtle and shark interactions available to the assessment team. The INP observer programme does record interactions with turtles, dolphins and sharks but does not issue a report in this regard. There is clear historical evidence of interactions between the small pelagic fishery and shark species, and this is likely to be ongoing⁵⁵.

F1.2 – There was no evidence uncovered during this assessment to indicate that the small pelagic fishery has a substantial negative impact on ETP species. However this may be due to the lack of information recorded in relation to interactions and this clause will be revisited as further details become available.

F1.3 – Fishing of all turtle and whale species is permanently prohibited in Ecuadorian waters, as is the capture of giant manta ray (*Manta birostris*), manta rays *Mobula japonica*, *M. thurstoni*, *M. munkiana*, and *M. tarapacana*, whale sharks (*Rhincodon typus*), basking shark (*Cetorhinus maximus*), great white shark (*Carcharodon carcharias*) and sawtooths (*Pristis spp*)⁵⁶. There is an extensive National Plan of Action on the Conservation of Marine Turtles, published in 2014, which includes measures intended to reduce the impact of fisheries on the five turtle species present in Ecuadorian waters⁵⁷. There is also a National Plan for Sharks which has been in place since 2005⁵⁸.

Species around the Galapagos Islands are protected by the 50,000 square mile Galapagos Marine reserve, established in 1998 as an area completely closed to industrial fishing⁵⁹, including the small pelagic fishery. Although the majority of the area is open to artisanal fishing, there are also several substantial no-take zones⁶⁰.

⁵⁵ La administracion de los chondrichthyes en Ecuador.

⁵⁸ Plan de accion nacional de tiburones.

http://www.fao.org/tempref/FI/DOCUMENT/IPOAS/national/ecuador/PlandeAccionTiburonesPAT-Ec.pdf

⁵⁴ Fishsource page, Pacific chub mackerel Ecuador. <u>https://www.fishsource.org/stock_page/2280</u>

http://simce.ambiente.gob.ec/sites/default/files/documentos/anny/La%20Administraci%C3%B3n%20de%20los %20Chondrichthyes%20en%20Ecuador.pdf

⁵⁶ MAP website, summary of fisheries regulations and measures.

http://www.acuaculturaypesca.gob.ec/subpesca121-medidas-de-ordenamiento-y-regulacion-pesquera.html ⁵⁷ Plan nacional para la conservacion de las tortugas marinas. <u>http://conservation.org.ec/wp-</u> <u>content/uploads/2014/12/Plan-Nacional-Tortugas-COMPLETO-PdF.pdf</u>

⁵⁹ Atlas of Marine Protection – Galapagos marine reserve. <u>http://www.mpatlas.org/mpa/sites/901/</u>

Improver Programme Notes

The Gap ratings in this section are largely the result of limited information on the extent to which the fishery interact with ETP species. Understanding these interactions is key to establishing whether or not they are successfully mitigated. The fishery improvement plan should focus initially on improving the understanding of the extent to which interactions occur, and from their implementing measures to mitigate these interactions. Unpublished observer data may be a useful starting point.

Standard clause 1.3.3.1

F2	2 Impacts on Habitats - Minimum Requirements					
. –	F2.1	Potential habitat interactions are considered in the management decision-making	DASS			
		process.	FA33			
	F2.2	There is no substantial evidence that the fishery has a significant negative impact on	DACC			
		physical habitats.	FA33			
	F2.3	If the fishery is known to interact with physical habitats, there are measures in place to	DACC			
		minimise and mitigate negative impacts.	PASS			
		Clause outcome:	PASS			

Evidence

F2.1 – Purse seine gear is unlikely to interact with physical habitats and is generally considered to represent a low risk to the seabed. Extensive mapping of coastal marine habitats was conducted by the Ministry of Environment in 2006⁶¹, and an interactive map of these habitats was made available in 2015. Additional, externally-conducted studies on important fish habitats, such as mangroves, are also carried out in the country^{62,63}. It is not clear how, if at all, the outcomes of these reports factor in to the management of the small pelagic fishery.

F2.2 – Given the nature of the gear used in the fishery, it is unlikely to have significant negative impacts on physical habitats. There is no clear evidence in any of the documentation encountered by the assessment team to suggest that the Ecuadorian small pelagic fishery differs from other purse seine fisheries in this regard (although there are reportedly no studies which have been conducted specifically to examine this⁶⁵).

F2.3 – Given the nature of the gear used in the fishery, it is unlikely to interact with physical habitats. The Galapagos Marine Reserve provides protection to a number of important and rare habitats in Ecuadorian waters, including seamounts, reefs, underwater cliffs, wetlands and lagoons⁶⁴, and there are a total of 22 marine and coastal areas in the country with some form of protection from fishing activities. Waters within 1 mile of the

http://www.protectedareas.info/upload/document/ecuadormarinegapanalysissummary-spanish.pdf

⁶³ Manta Trust website, "Proyecto Mantas Ecuador". <u>https://www.mantatrust.org/ecuador/</u>

⁶⁴ National Geographic website. "Case Study: Galapagos Marine Reserve".

⁶⁰ Washington Post. Ecuador just created a huge new Galapagos marine reserve – around an island named Darwin. <u>https://www.washingtonpost.com/news/energy-environment/wp/2016/03/21/this-galapagos-island-named-darwin-will-now-anchor-a-vast-new-marine-reserve</u>

⁶¹ Ministry of Environment. "Analisis de Vacios e Identificacion de Area Prioritarias para la Conservacion de la Biodiversidad Marino-Costera en el Ecuador Continental, Resumen Ejectivo.

⁶² Burgess, Quin, Li, 2015. Mangroves in Ecuador: an application and comparison of ecosystem services valuation models.

https://dukespace.lib.duke.edu/dspace/bitstream/handle/10161/9597/Burgess%20Qin%20Li%20MP.pdf?sequence=1

https://www.nationalgeographic.org/news/case-study-galapagos-marine-reserve/

Ecuadorian mainland coast are also closed to fishing, to protect spawning areas, and waters within 8 miles of the coast are closed to industrial vessels⁶⁵.

Improver Programme Notes

In general, it is usually straightforward for a purse seine fishery to pass the Habitats section of the IFFO RS assessment due to the low probability of interactions with the physical environment. However, in some pelagic fisheries, the large size of the nets combined with operations in relatively shallow waters can make habitat interactions possible, and the FIP should be aware of this possibility depending on the specific nature of the fishing activity being carried out. Additionally, although there is no evidence that this is the case, if other gear types are used in the fishery (i.e. if the applicant wishes to use small pelagic fish from non-purse-seine gears as an approved raw material), this section will need to be updated accordingly. Benthic trawl gears, in particular, would require substantially more evidence of mitigating technical measures.

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.	GAP
	F3.2	There is no substantial evidence that the fishery has a significant negative impact on the marine ecosystem.	GAP
	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.	GAP
		Clause outcome:	GAP

Evidence

F3.1 – There is no substantial evidence that the broader ecosystem is considered during the fishery management process. Due to the substantial impact which environmental factors exert on the relative availability of the small pelagic species, changes in catch composition may simply reflect natural variation in ecosystems over time. Anecdotal reports from the fishery itself state that fishers are not able to target specific species and simply catch whatever is available at the time. Therefore it is likely that changes in catch composition over time are driven primarily by environmental factors.

F3.2 – There is no clear evidence of managerial efforts to understand or mitigate any potential impacts of the fishery on ecosystems.

F3.3 – Given the range of species captured in the fishery, and the trophic importance of many small pelagic species, it is likely that one or more of the species covered by this assessment plays a key role in the ecosystem. HoweverHowever, there is no evidence that any particular species are subjected to additional precaution in terms of management or research, beyond subjecting those species characterised as 'main' species to an additional (but still limited) degree of scrutiny.

Improver Programme Notes

Substantially more information on the potential impacts of the fishery on the ecosystem are required before the fishery can be approved against this section, and the fishery improvement plan should make understanding

⁶⁵ Fishsource species page, Pacific chub mackerel, Ecuador. <u>https://www.fishsource.org/stock_page/2280</u>

these impacts and factoring them into management decisions a priority.

Standard clause 1.3.3.3

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.

Improver Programme Notes

In the current version of the IFFO RS fishery assessment, the social component is limited to a commitment from applicants. The extent to which this commitment is 'tested' is limited. However, applicants to the Improver Programme should be aware that this section will be under continuing development over the coming year(s), and additional social requirements are likely to be added before the end of any FIP process.