# MarinTrust Standard V2

# Whole fish Fishery Assessment Report Template

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# Table 1 Application details and summary of the assessment outcome

| Application details and summary of the assessment outcome | | | |
|---|---|---|---|
| **Name:** | | | |
| **Address:** | | | |
| **Country:** Peru | | **Zip:** | |
| **Tel. No.** | | **Fax. No.** | |
| **Email address:** | | **Applicant Code** | |
| **Key Contact**: | | **Title:** | |
| **Certification Body Details** | | | |
| **Name of Certification Body:** | | Global Trust Certification | |
| **Assessor Name** | **CB Peer Reviewer** | **Assessment Days** | **Initial/Surveillance/ Re-approval** |
| Virginia Polonio | Géraldine Criquet | 3 | Surveillance 2 |
| **Assessment Period** | To May 2021 | | |
| | | | |
| **Scope Details** | | | |
| **Management Authority (Country/State)** | | Peru Ministry of Production (PRODUCE). | |
| **Main Species** | | Anchoveta (*Engraulis ringens*) | |
| **Fishery Location** | | Northern Border of Peruvian EEZ to 160 South | |
| **Gear Type(s)** | | Purse seine (industrial fleet) | |
| **Outcome of Assessment** | | | |
| **Overall Outcome** | | Pass | |
| **Clauses Failed** | | None | |
| **CB Peer Review Evaluation** | | Agree with the assessor's determination. | |
| **Fishery Assessment Peer Review Group Evaluation** | | | |
| **Recommendation** | | Approved | |

# Table 2. Assessment Determination

| Assessment Determination |
| --- |
| The Peruvian North-central anchoveta fishery (Anchoveta) extends from the northern end of the Peruvian EEZ down to $16^0$S. This represents a single biological stock, expanding in recent warmer years to the Gulf of Guayaquil (3°00' S) in Ecuador. The status of north-central anchoveta as a single biological stock is confirmed by Cahuin et al 2015.<br><br>Total fishing mortality is restricted using a system of TAC's and Catch Limits per Vessel. Catch restrictions cover the whole fleet, and place both Anchoveta (*Engraulis ringens*) and Longnose anchoveta (*Anchoa nasus*) in a single management unit.<br><br>In this report, Anchoveta from artisanal fleet which is exclusively for human consumption is not included in the scope of this assessment. However, as in previous reports, some references pertain to both the industrial and artisanal fisheries as both fisheries have regulations and management measures in common, meaning that applies for all the fleet independently whether is for direct or indirect consumption.<br><br>Peruvian law allows up to 5% of non-target species bycatch in weight in this fishery. Catches of other small pelagic fishes such as the South American pilchard (*Sardinops sagax*); Jack Mackerel (*Trachurus murphyi*); Chub mackerel (*Scomber japonicus*) and the Humboldt squid (*Dosidicus gigas*) have begun to contribute to sizeable catches and are considered in this assessment.<br><br>Information in ETPs species should be improved as the data available are from a private initiative of SALVAMARES observed programme and it should be extended to the whole fleet. No new reports have been published since 2019, however, information has been found enough to pass the clause as improvements have been carried out and developments were planned for 2020 that they should be reflected in the upcoming reports.<br><br>More information should be collected to define the direct and indirect impacts that the fishery could have in vulnerable species and habitats. Encountered habitats should be defined with more clarity as there is controversial information through observer reports. However, the assessor has concluded that the fishery can pass habitats' clauses.<br><br>In this Surveillance 2, significant changes that could affect the results obtained in previous years have not been, new stocks assessment reports are yet to be published. Similarly, no new information from observer programmes is available at the moment. Habitats studies are still needed but the world pandemic situation has also affected the acquisition of more data and the development of studies in the area.<br><br>None of the species assessed in this report are categorised as Endangered or Critically Endangered on the IUCN Red list nor is listed in Appendix 1 of CITES.<br><br>The assessor determined that Anchoveta **PASSES** for the production of fishmeal and fish oil under the MarinTrust v 2.0 by-products standard for whole fish. |
| **Fishery Assessment Peer Review Comments** |
| The assessor correctly classified all species in conformity with the Species categorisation requirements.<br>The fishery is managed by the Peru management system. There is a monitoring, surveillance and control system in place. There is a harvest strategy in place to ensure that stocks are fished at sustainable levels. Data are collected and stocks are assessed. |

| |
|---|
| In the most recent stock assessment, the latest estimate the Anchoveta stock (category A) is considered above the reference point. There is a mechanism in place by which total fishing mortality of the stock is restricted.<br>In the most recent stock assessment, all Category C stocks have a biomass above the limit reference point. Category D species pass Table D3.<br><br>There is no evidence that the fishery significantly impacts habitats, ETP species and the ecosystem.<br><br>Therefore, all stocks should be awarded continued approval for the production of fishmeal and fish oil under the IFFO-RS v 2.0 standard. |
| **Notes for On-site Auditor** |
| |

# Table 3 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 |

# Table 4 Species- Specific Results

**List all Category A and B species. List approximate total percentage (%) of landings which are Category C and D species; these do not need to be individually named here**

| Category | Species | % landings | Outcome (Pass/Fail) | |
|---|---|---|---|---|
| Category A | Anchoveta (*Engraulis ringens*) | 95% | A1 | PASS |
| | | | A2 | PASS |
| | | | A3 | PASS |
| | | | A4 | PASS |
| Category C | Chilean jack mackerel, *Trachurus murphyi* | <5% | PASS | |
| Category C | Pacific Chub mackerel, *Scomber japonicus* | <5% | PASS | |
| Category C | Humboldt squid, *Dosidicus gigas* | <5% | PASS | |
| Category D | Longnose anchoveta, *Anchoa nasus* | <5% | PASS | |
| Category D | South American pilchard, *Sardinops sagax* | <5% | PASS | |

# Table 5 Species Categorisation Table

| Common name | Latin name | Stock | IUCN Redlist Category[1] | % of landings | Management | Category |
|---|---|---|---|---|---|---|
| Anchoveta | *Engraulis ringens* | Peru Nth border to $16^0$S | LC | 95% | Ministry of Production (PRODUCE). | A |
| Chilean jack mackerel | *Trachurus murphyi* | Peru Nth border to $16^0$S | LC | <5% | Ministry of Production (PRODUCE). | C |
| Pacific Chub mackerel | *Scomber japonicus* | Peru Nth border to $16^0$S | LC | <5% | Ministry of Production (PRODUCE). | C |
| Humboldt squid | *Dosidicus gigas* | Peru Nth border to $16^0$S | LC | <5% | Ministry of Production (PRODUCE). | C |
| Longnose anchoveta | *Anchoa nasus* | Peru Nth border to $16^0$S | LC | <5% | Ministry of Production (PRODUCE). | D |
| South American pilchard | *Sardinops sagax* | Peru Nth border to $16^0$S | LC | <5% | Ministry of Production (PRODUCE). | D |

**Species categorisation rationale**

The same approach used in the last surveillance has been taken for this surveillance 2 as no new information has been reported to the assessment team and there is no relevant changes in the fishery to conclude in different categorisation of the species involved in this fishery.
Catch restrictions cover the entire industrial fleet, and place both Anchoveta (*Engraulis ringens*) and Longnose anchoveta (*Anchoa nasus*) into a single management unit (PRODUCE Ministerial Order 044/2019). Peruvian law allows just up to 5% of non-target species bycatch in weight in this fishery.

IMARPE provides landings data on target and bycatch species in their "Evaluación del Plan Operativo" (POI, 2019), further CeDePesCa reports show the incidental catches of the fishery and their composition. Anchoveta is reported as 97.3% by volume; Pacific Chub Mackerel (2.7% by volume) and other minor species including Chilean Jack mackerel were noted as being landed.

Chilean jack mackerel (*Trachurus murphyi*), Chub mackerel (*Scomber japonicus*), South American pilchard (*Sardinops sagax*); and the Humboldt squid (*Dosidicus gigas*) have begun to contribute to sizeable catches recently, as noted in a 2019 PRODUCE press release. Further in the FIP project carried out by CeDePesca Humbolt squid is also recognised as a bycatch in the fishery, however, the total catch of non-target species is very low accounting to 0.2%.

[1] https://www.iucnredlist.org/

# MANAGEMENT

The two clauses in this section (M1, M2) relate to the general management regime applied to the fishery under assessment. The clauses should be completed by providing sufficient evidence to justify awarding each of the requirements a pass or fail rating. 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. | Yes |
| | M1.2 | There is an organisation responsible for collecting data and assessing the fishery. | Yes |
| | M1.3 | Fishery management organisations are publicly committed to sustainability. | Yes |
| | M1.4 | Fishery management organisations are legally empowered to take management actions. | Yes |
| | M1.5 | There is a consultation process through which fishery stakeholders are engaged in decision-making. | Yes |
| | M1.6 | The decision-making process is transparent, with processes and results publicly available. | Yes |
| | | **Clause outcome:** | PASS |

**M1.1 There is an organisation responsible for managing the fishery.**

This assessment concerns the Peruvian North-central anchoveta fishery (Anchoveta) which extends from the northern end of Peru's EEZ down to $16^0$S (Figure 1 & Figure 2):

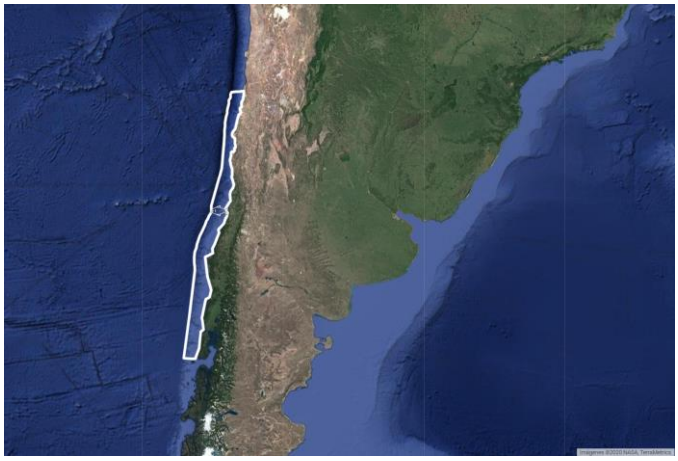

**Figure 1.** Spatial distribution of industrial fishery of Anchoveta in the Northern-Central Area. (Source: Fishsource)

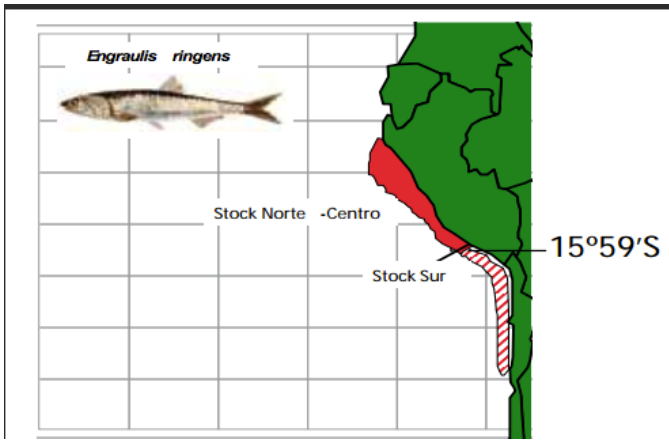


**Figure 2.** Anchoveta, *Engraulis ringens*, stocks off Peru. (Source: Fishsource)

Fisheries management falls under the jurisdiction of the Vice-Ministry of Fisheries in the Ministry of Production (PRODUCE). PRODUCE itself was created in 2002 by Peruvian Law number 27779. Responsibilities of the Vice-Ministry include the development and implementation of management plans, conducting fisheries research, establishing the regulatory framework for fisheries management, and the issuing and administering of regulations. Annual catch limits and technical measures that

regulate the fishery are published on PRODUCE website through Ministerial Resolutions (Resolución Ministeriales) and Decreto Supremos.
Therefore, there is an organisation responsible for managing the fishery and the stock complex **PASSES** Clause M1.1.

**M1.2 There is an organisation responsible for collecting data and assessing the fishery.**

The Instituto del Mar del Peru (IMARPE) is a specialised Governmental technical agency with responsibility for conducting research necessary to ensure informed fisheries management decisions are taken at the ministerial level. IMARPE conduct stock assessments and recommend annual catch limits of the stock.

IMARPE provide regular reports on activity in the fishery which include, among other reports: ***Informe Técnicos***: results of acoustic surveys; ***Prospección biológico-pesquera***: stock assessments and advice on TAC's and ***Reporte del Progamas Bitacora de Pesca:*** observer reports and log sheet data.

After carrying out regular biannual hydroacoustic surveys, IMARPE release catch advice following set protocols (IMARPE, 2015):

- Estimation of stock size, structure and biomass using data from biannual acoustic surveys
- Projection of size structures under different scenarios (exploitation, growth and mortality, which will 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 incorporated into stock assessments indirectly via acoustic surveys and population length frequency data.

Therefore, there is an organisation responsible for collecting data and assessing the fishery, so the stock complex **PASSES** Clause M1.2.

**M1.3 Fishery management organisations are publicly committed to sustainability.**

The Fisheries Law No 25977 (Ley General de Pesca) contains 12 Titles and 90 Articles. Management objectives include ensuring sustainability of fisheries and of aquatic resources. Article 1 recognises fishing as a food and employment source which must be used wisely, maximising economic benefits while preserving biodiversity and the environment.

An ecosystem approach to fisheries management is in force, based on best available scientific evidence and including the consideration of economic and social aspects to fishing activities. A National Environmental Policy for ecosystem conservation was ratified in 2016, following Government's formal acceptance of the Paris Agreement.
Further, every year IMARPE presents the "Plan Operativo Institucional" where main results of commercial stocks are presented (i.e. surveys results, landings, management modifications)

Therefore, fishery management organisations are publicly committed to sustainability, so the stock complex **PASSES** Clause M1.3.

**M1.4 Fishery management organisations are legally empowered to take management actions.**

PRODUCE Decreto Supremo N° 021-2008 (Article 3) gives Officials legal authority to determine the length of fishing seasons and TAC's (el Límite Máximo Total de Captura Permisible (LMTCP)) based on IMARPE recommendations.

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.

Regulations relevant to fisheries legislation include:

- Title XI Artícles 76 – 83: Ley 25977 Ley General de Pesca (1998): List of Prohibitions, Infractions and Sanctions. Al Sanctions are issued through PRODUCE Resolución Directorales.
- Chapter II Articles 103-107: Fisheries Inspectors: Competencies and obligations of fishing skippers

Article 9 of the Ley General de Pesca (Fisheries Law, 1998) No 25977 empowers PRODUCE to determine, based on available scientific evidence and socioeconomic factors, fishing quotas, management tools, fishing areas and seasons, the regulation of fishing effort and other technical measures to promote the preservation and rational exploitation of aquatic Resources.

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 alleged illegal fishing activities.

Therefore, fishery management organisations are legally empowered to take management actions, so the stock complex **PASSES** Clause M1.4.

**M1.5 There is a consultation process through which fishery stakeholders are engaged in decision-making.**

Sociedad Nacional de Pesquería (SNP) is a non-profit organisation having as its mission statement to lead the development of fishing and aquaculture industries in Peru through fighting illegal activities and promoting the protection of the environment through sustainable fishing, good science and innovative practices.

SNP's objectives include representing the industry in Government fora and meetings and to facilitate cooperation with Government and Regional Departments that promote and develop the fishing and aquaculture industries in Peru.

SNP has developed an Ethical code in which article 7 is aimed at complaining with the decision-making process. The government and SNP have signed agreements to comply the decision-making processes in a transparent to provide timely solutions in fisheries matters. Therefore, SNP will sponsor and ensure that the Peruvian State, in accordance with these commitments, will facilitate consultation and the effective participation of the industry, fishing workers, fishermen and other institutions and organizations interested in decision-making process regarding the development of standards and policies related to fisheries management.

Since 2015 both IMARPE and PRODUCE are gradually improving transparency regarding the management of this fishery. IMARPE publishes daily landing records from industrial (IMARPE 2017).

There are several committees to represent all the stakeholders in the fisheries. The decision-making process is made publicly available and there is a consultation process through which fishery stakeholders are engaged in decision-making, so the stock complex **PASSES** Clause M1.5.

**M1.6 The decision-making process is transparent, with processes and results publicly available.**

Annual catch limits and technical measures that regulate the fishery are published on the PRODUCE website. IMARPE provide regular reports on activity in the fishery which include, among other reports: Informe Técnicos: results of acoustic surveys; Prospección biológico-pesquera: stock assessments and advice on TAC's; Reporte del Progamas Bitacora de Pesca: observer reports and logsheet data. Local and international Press comment on IMARPE and PRODUCE activities and on the reporting of the state of Peru's fisheries and aquaculture operations. The different committees that represent SNP take part of meetings to agree management measures that are published as ministerial regulations.

The "Direccion General de Politicas y Desarrollo pesquero" uses different management rules to set up the TACs for each fishing season. The three conditions considered are detailed below:

1. Environmental scenario is selected in each fishing season. That is, if the conditions for the stocks this year are: favorable, not favorable or neutral for the anchoveta stock.
2. A target spawning biomass value between the 3 - 6 million tons associated with a risk less than 50% is selected.

3. An exploitation rate that should be less than 0.35% is applied when TAC is defined.

Decision-making processes respond to conflicts that can occurs in the fishery. Legislation has been timely taking into account to respond to general decisions, i.e. when closure has to be done because of the present of juveniles. The application of the S.D. 024-2016-PRODUCE allows to define the fishing areas with high incidence of juveniles. Depending on the percentage of juveniles, the area will be closed in up to 5 days. Therefore, a precautionary approach based on the best available information is followed when discussing the management strategy and IMARPE recommendations are taken into account.
These management strategies are applied and they are published and revised by IMARPE and the different committies. 2020 protocol can be found in IMARPE website.

Therefore, there is a consultation process through which fishery stakeholders are engaged in decision-making and the process is transparent, with processes and results publically available.
Therefore, the decision-making process is transparent, with processes and results publicly available so stock complex **PASSES** Clause M1.6.

**References**


Cahuin, S.M.; Cubillos, L. A.; Escribano, R. 2015. Synchronous patterns of fluctuations in two stocks of anchoveta Engraulis ringens Jenyns, 1842 in the Humboldt Current System. J. Appl. Ichthyol. 31, 45‐50, ISSN 0175‐8659.
http://onlinelibrary.wiley.com/doi/10.1111/jai.12646/pdf
PRODUCE Ministerial Order 044/2019: Peruvian and Longnose anchoveta assessments
https://www.gob.pe/institucion/produce/normas-legales/259715-044-2019-produce
IMARPE Reporting Evaluación del Plan Operativo (Landings data):
https://www.transparencia.gob.pe/enlaces/pte_transparencia_enlaces.aspx?id_entidad=103&id_tema=5&ver=#.YMIGnPnduUk
PRODUCE Press Release (2019) on by-catch in the anchoveta fishery:
https://www.gob.pe/institucion/produce/noticias/27097-produce-desembarque-del-sector-pesca-crecio-7-5-en-febrero-por-mayor-captura-de-pota-jurel-y-caballa
SPRFMO 2019. 7th SPRFMO Scientific Committee meeting.
https://www.sprfmo.int/meetings/scientific-committee/7th-sc-2019/
IMARPE, 2007: Species characteristics South American Pilchard *Sardinops sagax* 6pp
http://www.imarpe.gob.pe/imarpe/archivos/articulos/imarpe/recursos_pesquerias/adj_pelagi_adj_pelagi_sardi_mar07.pdf
Fishsource Anchoveta Chilean Central-Southern
https://www.fishsource.org/stock_page/1380
Mapping South America's fish stock boundaries: Christopher M. Free Sustainable Fisheries Group UC Santa Barbara:
https://marine.rutgers.edu/~cfree/mapping-south-american-fish-stock-boundaries/
PRODUCE homepage: https://www.gob.pe/produce
PRODUCE Plataforma digital Cierre de 61 zonas para la conservación del stock de Anchoveta Enero2020.https://www.gob.pe/institucion/produce/noticias/77881-produce-realizo-61-cierres-preventivos-de-zonas-de-pesca-para-favorecer-conservacion-de-la-anchoveta
Peruvian anchoveta FIP Fishery Progress: https://fisheryprogress.org/fip-profile/peruvian-anchoveta-industrial-purse-seine
IMARPE Homepage: http://www.imarpe.gob.pe/imarpe/
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
General Fisheries Law No 25977 http://extwprlegs1.fao.org/docs/pdf/per1377.pdf
Peru approves new innovative environmental policies:
https://www.forest-trends.org/blog/peru-approves-new-innovative-environmental-policies/PRODUCE Resolución Directoral N° 04985-2018-PRODUCE/DS-PA (Fines applied) https://cdn.www.gob.pe/uploads/document/file/203422/97443_1.pdf
PRODUCE Protocol (No. 054-2019-MP-FN) Combat IUU activities:
http://cedepesca.net/wp-content/uploads/2017/05/DS-005-2017-PRODUCE_ROP-anchoveta-CHD.pdf

Sociedad Nacional de Pesquería (SNP) Mission Vision Statement, Summary 2019 First anchoveta season: https://www.snp.org.pe/mision-y-vision/
PRODUCE Organigramme (2017) Discreto Supreme No 009-2017:
https://cdn.www.gob.pe/uploads/institution/orgchart/000/000/055/organigrama.pdf

Elaboración de la Tabla de Decisión para la determinación del Límite Máximo de Captura Total Permisible por temporada de pesca en la pesquería del Stock Norte-Centro de la anchoveta peruana. 2020
https://www.gob.pe/institucion/imarpe/informes-publicaciones/1202194-elaboracion-de-la-tabla-de-decision-para-la-determinacion-del-limite-maximo-de-captura-total-permisible-por-temporada-de-pesca-en-la-pesqueria-del-stock-norte-centro-de-la-anchoveta-peruana
Management Strategy Evaluation for the anchoveta fishery. Ray Hilborn and Ricky Amoroso .School of Aquatic and Fishery Sciences University of Washington, December 2019.

| Links | |
|---|---|
| **MARINTRUST Standard clause** | 1.3.1.1, 1.3.1.2 |
| **FAO CCRF** | 7.2, 7.3.1, 7.4.4, 12.3 |
| **GSSI** | D.1.01, D.4.01, D2.01, D1.07, D1.04, |

| **M2** | **Surveillance, Control and Enforcement - Minimum Requirements** | | |
|---|---|---|---|
| | **M2.1** | There is an organisation responsible for monitoring compliance with fishery laws and regulations. | Yes |
| | **M2.2** | There is a framework of sanctions which are applied when laws and regulations are discovered to have been broken. | Yes |
| | **M2.3** | There is no substantial evidence of widespread non-compliance in the fishery, and no substantial evidence of IUU fishing. | Yes |
| | **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. | Yes |
| | | **Clause outcome:** | PASS |

**M2.1 There is an organisation responsible for monitoring compliance with fishery laws and regulations.**

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, Decreto Supremo No 009-2017 PRODUCE) although landings are also monitored and recorded by the international surveillance company SGS. These third-party operators verify landing operations at 134 designated landing sites.

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. A recent prosecution reported involved illegal landing of anchoveta. There are at any one time up to 650 inspectors conducting daily control operations across Peru during periods of heavy fishing activity.

Monitoring and compliance regarding discards and zonal invasions (industrial vessels operating within 5nm from the coastline) are expected to increase with the electronic log system and mandatory positioning system now on board for all fleets. Most infractions relate to excess of juveniles onboard or fishing without prior notification.

Therefore, there is an organisation responsible for monitoring compliance with fishery laws and regulations and the fishery **PASSES** Clause M2.1.

**M2.2 There is a framework of sanctions which are applied when laws and regulations are discovered to have been broken.**

PRODUCE publishes lists of sanctions invoked and relevant laws, fines, and fishing suspensions on their website, as required by Regulations of the Organization and Functions of the Ministry of Production. Other regulations relevant to the application of 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: Powers of inspectors during inspections, including issuing fines for non-compliances.
- Decreto Supremo No 024-2016-PRODUCE: Measures (fines, withdrawal of licences) to strengthen control and inspection.

Therefore, there is a framework of sanctions which are applied when laws and regulations are discovered to have been broken so the fishery **PASSES** Clause M2.2.

**M2.3 There is no substantial evidence of widespread non-compliance in the fishery, and no substantial evidence of IUU fishing.**

In 2010, alleged estimates for undeclared anchoveta catches by fishing companies was 10%, confirming that the data gathering system needed improvement. One of the goals of the FIP in progress is to 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.

From October 2018 the Government made available VMS data from the fleets to the Global Fishing Watch (GFW) application. At the time Peru were the first Latino American Country to contribute these data to the GFW platform which has as its goal to improve transparency in fishing operations and reduce IUU fishing worldwide. Vessels from industrial fleets were included.

The fishery is closed to new vessels, there is 24-hour monitoring of all 134 designated landing sites 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, i.e. landings at the beginning of the first seasons of 2020 were approx. 13.22 % of the total catch in the season however, where catches are too high PRODUCE introduced a fishing closure avoiding illegal and to not to exceed the total annual catch. (R. M. 544-2019-PRODUCE)

Most infractions relate to excess of juveniles onboard or fishing without prior notification.

Therefore, there is no substantial evidence of widespread non-compliance in the fishery, and no substantial evidence of IUU fishing so the fishery **PASSES** Clause M2.3.

**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.**

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 incorporated into the SISESAT system. PRODUCE states that the app allows accredited inspectors check location, speed, direction and distance of fishing vessels to coast with more accuracy than traditional satellite systems. Mandatory vessel monitoring systems (VMS) are in place, as required by PRODUCE Decrees Nº10/2010, Nº5/2012 and Nº01/2013. The electronic/radio log is required as well for the fishery (PRODUCE 2016a). There is 24-hour monitoring of all 134 designated landing sites to ensure that only those vessels with a permit are allowed to land catch.

Therefore, compliance with laws and regulations is actively monitored, through a regime which may include at-sea and portside inspections, observer programmes, and VMS so the fishery **PASSES** Clause M2.4.

**References**

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|---|---|
| DECRETO SUPREMO Nº 016-2007-PRODUCE: el Reglamento de Inspecciones y del Procedimiento Sancionador de las Infracciones en las Actividades Pesqueras y Acuícolas: http://www2.produce.gob.pe/dispositivos/publicaciones/2007/octubre/ds016-2007-produce.pdf<br>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<br>PRODUCE Press Release (Oct 2019): Perú ha demostrado liderazgo global en compartir sus datos de vigilancia pesquera: https://www.gob.pe/institucion/produce/noticias/61260-produce-peru-ha-demostrado-liderazgo-global-en-compartir-sus-datos-de-vigilancia-pesquera<br>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 | |
| **Links** | |
| **MARINTRUST Standard clause** | 1.3.1.3 |
| **FAO CCRF** | 7.7.2 |
| **GSSI** | D1.09 |

# 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. The clauses should be completed by providing sufficient evidence to justify awarding each of the requirements a pass or fail rating. The species must achieve a pass rating against all requirements to be awarded a pass overall. **If the species fails any of these clauses it should be re-assessed as a Category B species.**

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

**A1.1 Landings data are collected such that the fishery-wide removals of this species are known.**

IMARPE provide regular reports on fishery activities in the fishery including Informe Técnicos: results of acoustic surveys; Prospección biológico-pesquera: stock assessments and advice on TAC's; Reporte del Progamas Bitacora de Pesca: observer reports, daily landings data. Monitoring by independent third-party operators (SGS) verifies landing statistics at a total of 134 designated landing sites. Data collected include dates and location of catch, plus size frequency sampling. Logbooks are publicly available in IMARPE website (Figure 1)

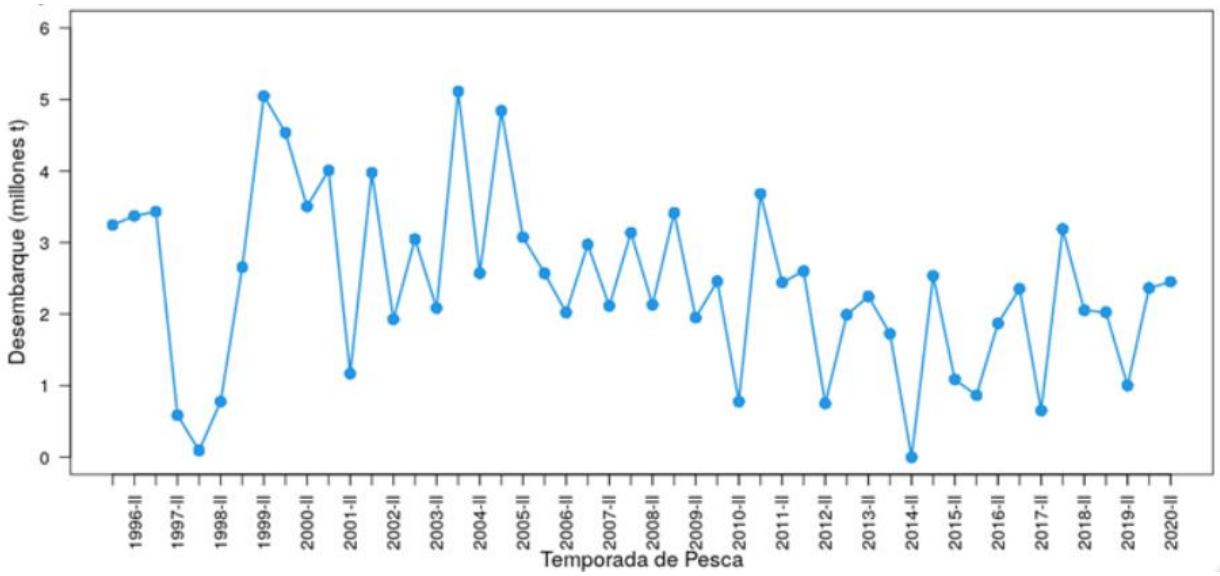



**Figure 1.** Landings of *Engralius rigens* by fishing season from 1996 to 2020-II in the North central region of EEZ Peru. Source: IMARPE, April 2021.

Therefore, landings data are collected such that the fishery-wide removals of this species are known so the fishery **PASSES** Clause A1.1.

**A1.2 Sufficient additional information is collected to enable an indication of stock status to be estimated.**

IMARPE carries out two acoustic surveys every year to evaluate the stock status of the species. The results showed in April 2021 report were considered to draft this report.

The Stock assessment report for April 2021 has shown that as observed by Cr. 2102-04, the acoustic biomass of the North Central Stock of the anchovy as of April 1, 2021 it accounts to 9,881 million t (IMARPE, 2021). This data is 17% higher than the biomass observed during the winter-spring of 2020 (Cr. 2009-11 with 8,423 million t) and comparable (-2%) to that observed during the summer of 2020 (Cr. 2002-04 with 10,107 million t). According to Ministerial Resolution No. 120-2021-Produce, the Ministry of

Production established a quota of 2.5 million tons in this fishing season for anchovy (*Engraulis ringens*) and white anchovy (*Anchoa nasus*) for indirect human consumption for the stock in the north-central zone.

IMARPE has determined that the total biomass of the north central stock amounts to 9,881 million tons. However, the size composition is made up of both juveniles and adults from 2 to 18 cm. This mixture of juvenile specimens requires monitoring to strengthen management and conservation measures. For that reason, Produce considered authorizing an exploratory fishing for 10 days, which will facilitate updating the information on the distribution and size structure of the anchovy, in order to adopt measures such as the partial or total closure of areas or protect the group of juveniles.

It was also reported that the stock is still in increasing trends as in 2020, in the midst of the COVID-19 pandemic, the landing of anchovy reached 4,314.6 million metric tons, a figure 27.6% higher than in 2019.

Therefore, sufficient additional information is collected to enable an indication of stock status to be estimated so the fishery **PASSES** Clause A1.2.

**References**

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

Sociedad Nacional de Pesquería (SNP) Mission Vision Statement, Summary 2019 First anchoveta season: https://www.snp.org.pe/mision-y-vision/

IMARPE 2020: North-central Peruvian anchovy stock (*Engraulis ringens*) situation during May 2020 and exploitation perspectives for the first 2020 fishing season.

**R28:** PRODUCE RM 483/2019: Quota allocation for 2nd fishing season 2019 (Nov): https://busquedas.elperuano.pe/normaslegales/autorizan-el-inicio-de-la-segunda-temporada-de-pesca-del-rec-resolucion-ministerial-n-483-2019-produce-1825767-1/

RESOLUCIÓN MINISTERIAL. Nº 00120-2021-PRODUCE. Lima, 22 de Abril de 2021. Situación del stock norte-centro de la anchoveta peruana (*Engraulis ringens*) a Abril de 2021 y perspectivas de explotación para la primera temporada de pesca del año. IMARPE, May 2021.

**Links**

| | |
|---|---|
| **MARINTRUST Standard clause** | 1.3.2.1.1, 1.3.2.1.2, 1.3.2.1.4, 1.3.1.2 |
| **FAO CCRF** | 7.3.1, 12.3 |
| **GSSI** | D.4.01, D.5.01, D.6.02, D.3.14 |

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

**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.**

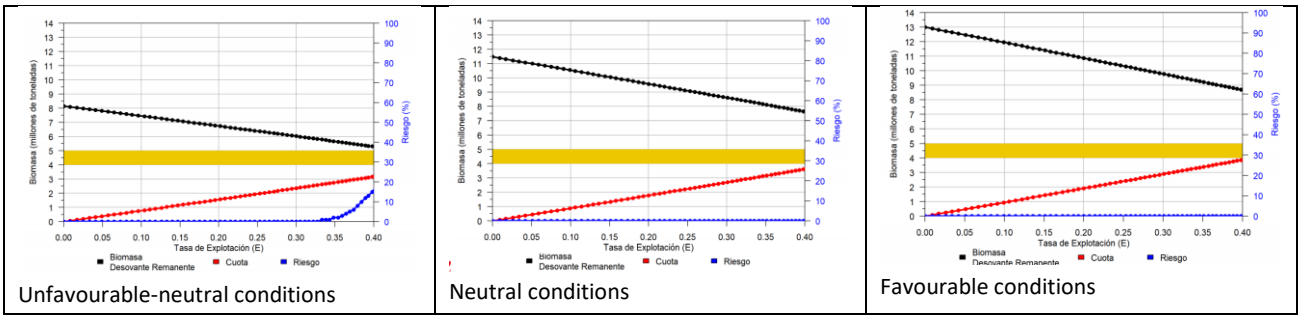
Stock assessments are published twice annually in IMARPE Reports **Situación del Stock Norte-Centro de la Anchoveta Peruana** based on acoustic surveys undertaken in Mar-April and November each year. The data (landings and discards) are collected and reported to IMARPE as logbooks are mandatories for all the fleet.

Therefore, a stock assessment is conducted at least once every 3 years and considers all fishery removals and the biological characteristics of the species so the fishery **PASSES** Clause A2.1.

**A2.2 The assessment provides an estimate of the status of the biological stock relative to a reference point or proxy.**

In April 2021 report, the estimation of the total biomass which was estimated at 9,881 million tons.
In the last stock assessment from April, a biomass reference level $SSB_{Ref}$ for the North-Central stock has been established at 5 million tons and it as recommended to reduce the exploitation rate to 0.35 to 0.3.

The species is strongly dependent on environmental variables, resulting in rapid fluctuations in biomass. Therefore, the assessment has considered three different scenarios depend on environmental condition being, unfavourable, favourable or neutral. According to IMARPE, TAC has been set up to a 0.35 exploitation rate and any of the three possible scenarios exceeds the catches, therefore they are below limit in any circumstance. (Figure 3).




Unfavourable-neutral conditions | Neutral conditions | Favourable conditions

**Figure 3.** Decision tables related to an unfavourable-neutral-favourable environmental scenario and in which it is assumed that the catches will be taken quickly at the beginning of the season. In the figure, the X axis contains different levels of Exploitation Rate (E), each of which corresponds to a TAC (red line whose value is read on the left vertical axis). The black line is the Spawning Biomass that would become available to the next reproductive year (winter 2022) as a consequence of the level of exploitation rate defined. The yellow bar denotes target and limit spawning biomass levels necessary to sustainably renew the stock. The blue line corresponds to the risk of having a spawning biomass of less than 5 million t as consequence of the Exploitation Rate (IMARPE 2021).

The assessment provides an estimate of the status of the biological stock relative to a reference point or proxy and therefore the fishery **PASSES** clause A2.2.

**A2.3 The assessment provides an estimate of the status of the biological stock relative to a reference point or proxy.**

Using data from the acoustic surveys a decision table is provided by IMARPE to PRODUCE to facilitate estimating the sustainable level of fishing mortality based on announced quotas. The assumption is taken in three different scenarios depends on environmental conditions. Figure 3 above shows the decision tables provided by IMARPE based on acoustic survey data (SSB) derived in April 2021 prior to the opening of the first fishing season. Following the results, target exploitation rate (F) have been established at 0.35, the historical average level for defining quotas, derived from the IMARPE Report on protocol establishing fishing quotas (maximum limit total allowable catch).

Therefore, the assessment provides an indication of the volume of fishery removals which is appropriate for the current stock status so the fishery **PASSES** Clause A2.3

**A2.4 The assessment is subject to internal or external peer review.**

The FIP in force has achieved formal collaboration with IMARPE and a signed MOU (2018) with PRODUCE which established terms for technical collaboration towards fisheries' sustainability. A consultant's report was presented (Dec 2019) to IMARPE and SNP on the role of the Management Strategy Evaluation (MSE) approach to, among other issues, improve the determination of stock status in the fishery. Different combinations of target harvest rate and different stock size thresholds were tested.

Following presentation of results of the MSE, IMARPE have been requested to add more harvest strategies and operating models and to generate more discussion with stakeholders on improving the quality of stock assessments.

The assessment is subject to internal or external peer review so the fishery **PASSES** Clause A2.4.

**A2.5 The assessment is made publicly available.**

In March 2015, IMARPE published a methodology for generating total permissible catch recommendations. Stock assessments are published twice annually in IMARPE Reports Situación del Stock Norte-Centro de la Anchoveta Peruana based on acoustic surveys undertaken in Mar-April and November each year. Based on these stock assessments PRODUCE issue online Resolución Directorales (RD) or Resolución Ministeriales (RM) which allocate each quota (first and second fishing season) to the fleet.

When considered alongside regular reports posted online summarising the outcomes of observer reports and daily analyses of logsheet data (Reporte del Progamas Bitacora de Pesca) the process appears to now be fairly transparent.

Therefore, the assessment is made publicly available so the fishery **PASSES** Clause A2.5.

**References**

IMARPE Reports (2013-2017) Situación del Stock Norte-Centro de la Anchoveta Peruana: http://www.imarpe.gob.pe/imarpe/include/busqueda.php

IMARPE Observer Reports, Programme: http://www.imarpe.gob.pe/imarpe/archivos/informes/imarpe_otropr_bitaco_otro_progra_set10.pdf

IMARPE 2020: North-central Peruvian anchovy stock (*Engraulis ringens*) situation during May 2020 and exploitation perspectives for the first 2020 fishing season.

Sociedad Nacional de Pesquería (SNP) Report No 2/2019: Resumen sobre la actividad pesquera industrial Source IMARPE https://www.snp.org.pe/media/pdf/Boletin-Temporada-de-Pesca/Boletin-03.pdf

PRODUCE RM 483/2019: Quota allocation for 2nd fishing season 2019 (Nov): https://busquedas.elperuano.pe/normaslegales/autorizan-el-inicio-de-la-segunda-temporada-de-pesca-del-rec-resolucion-ministerial-n-483-2019-produce-1825767-1/

RESOLUCIÓN MINISTERIAL. Nº 00120-2021-PRODUCE. Lima, 22 de Abril de 2021. Situación del stock norte-centro de la anchoveta peruana (*Engraulis ringens*) a Abril de 2021 y perspectivas de explotación para la primera temporada de pesca del año. IMARPE, May 2021.

**Links**

| | |
|---|---|
| **MARINTRUST Standard clause** | 1.3.2.1.2, 1.3.2.1.4, 1.3.1.2 |
| **FAO CCRF** | 12.3 |
| **GSSI** | D.5.01, D.6.02, D.3.14 |

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

**A3.1 There is a mechanism in place by which total fishing mortality of this species is restricted.**

The most recent version of the stock assessment protocol by IMARPE establishes also a target exploitation rate (F) of 0.35. This rate is still in operation and it is used to define the TAC.

According to Ministerial Resolution No. 120-2021-Produce, the Ministry of Production established a quota of 2.5 million tons in this fishing season for anchovy (*Engraulis ringens*) and Longnose anchovy (*Anchoa nasus*) for indirect human consumption for the stock in the north-central zone.

Therefore, there is a mechanism in place by which total fishing mortality of this species is restricted so the fishery **PASSES** Clause A3.1

**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.**

In recent years for which data are available, landings have been at or below the advised level. Fishery removals are reduced to reflect estimated biomass and cease entirely when the stock falls below a certain level. Discussions are ongoing with IMARPE and SNP, through implementation of recommendations of a recent workshop on Management Strategy Evaluation (MSE) to generate more discussion on improving the quality of stock assessments and providing greater transparency on how harvest control rules are developed (Figure 3).

Therefore, total fishery removals of this species do not regularly exceed the level indicated or stated in the stock assessment so the fishery **PASSES** Clause A3.2.

**A3.3 Commercial fishery removals are prohibited when the stock has been estimated to be below the limit reference point**

As an example of the control of the removals and the implementation of the harvest control rules, i.e. in the last stock assessment published in May 2020, IMARPE recommended that, for the second fishing season of 2019, the exploitation rate should not exceed the value of E = 0.35, as well as the implementation of the necessary management measures to protect the juvenile fraction of the stock (IMARPE, 2019a). In this context, the Ministry of Production (PRODUCE) authorized the carrying out of a fishing rate from November 06 (R. M. 477-2019-PRODUCE) and the start of the season proper as of November 16 (R. M. 483-2019-PRODUCE).A Total Maximum Allowable Catch Limit (LMTCP) of 2,786 million t was established.
Further, the second fishing season for the fishery has been closed in recent years when reported catches in first season were higher than expected or the presence of juveniles was higher than 10 %.

Therefore, commercial fishery removals are prohibited when the stock has been estimated to be below the limit reference point or proxy so the fishery **PASSES** Clause A3.3.

**References**

IMARPE 2020: North-central Peruvian anchovy stock (*Engraulis ringens*) situation during May 2020 and exploitation perspectives for the first 2020 fishing season.

| |
|---|
| Sociedad Nacional de Pesquería (SNP) Report No 2/2019: Resumen sobre la actividad pesquera industrial Source IMARPE https://www.snp.org.pe/media/pdf/Boletin-Temporada-de-Pesca/Boletin-03.pdf<br>RESOLUCIÓN MINISTERIAL. Nº 00120-2021-PRODUCE. Lima, 22 de abril de 2021. |
| *Standard clause 1.3.2.1.3* |

| **Links** | |
|---|---|
| **MARINTRUST Standard clause** | 1.3.2.1.3, 1.3.2.1.4 |
| **FAO CCRF** | 7.2.1, 7.22 (e), 7.5.3 |
| **GSSI** | D3.04, D6.01 |

| **A4** | **Stock Status - Minimum Requirements** | | |
|---|---|---|---|
| | **A4.1** | The stock is at or above the target reference point, OR IF NOT:<br><br>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:<br><br>The stock is estimated to be below the limit reference point or proxy, but fishery removals are prohibited. | Yes |
| | | **Clause outcome:** | PASS |

**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.**
The measured acoustic biomass of the North-Central Stock of Peruvian anchovy reached 10.11 million of tones, while the total biomass throughout the Peruvian sea amounted 11.05 million tons. The biomass reference point is set up at 5 million t. In all the scenarios showed in the assessment report, biomass was above the reference point and the risk of being below with an exploitation rate of 0.35 was nearly null (Figure 3).

Therefore, the stock is at or above the target reference point so the fishery **PASSES** Clause A4.1

**References**

IMARPE 2020: North-central Peruvian anchovy stock (*Engraulis ringens*) situation during May 2020 and exploitation perspectives for the first 2020 fishing season.
RESOLUCIÓN MINISTERIAL. Nº 00120-2021-PRODUCE. Lima, 22 de abril de 2021.

| **Links** | |
|---|---|
| **MARINTRUST Standard clause** | **1.3.2.1.4** |
| **FAO CCRF** | **7.2.1, 7.2.2 (e)** |
| **GSSI** | **D6 01** |

# 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.

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. Where a species fails this Clause, it may be assessed as a Category D species instead, EXCEPT if there is evidence that it is currently below the limit reference point.

| **Species Name** | | Chilean jack Mackerel (*Trachurus murphyi*) | |
|---|---|---|---|
| **C1** | **Category C Stock Status - Minimum Requirements** | | |
| | **C1.1** | Fishery removals of the species in the fishery under assessment are included in the stock assessment process, OR are considered by scientific authorities to be negligible. | Yes |
| | **C1.2** | The species is considered, in its most recent stock assessment, to have a biomass above the limit reference point (or proxy), OR removals by the fishery under assessment are considered by scientific authorities to be negligible. | Yes |
| | | **Clause outcome:** | PASS |

**C1.1 Fishery removals of the species in the fishery under assessment are included in the stock assessment process, OR are considered by scientific authorities to be negligible**.

Fisheries removals are collected by the South Pacific Regional Fisheries Management Organization conducts a joint jack mackerel assessment and since 2013, catch limits are agreed for the assessment unit area and for the Convention area, in accordance with scientific recommendations. Commercial landing data, information, and decisions from all fishing countries are integrated into the assessment process. Therefore, Fishery removals of the species in the fishery under assessment are included in the stock assessment process. The catch data for the model sum values from various countries and form four "fleets", which are intended to be consistent with the gear and general areas of fishing. The catches from each of these fleets are presented in figure below.

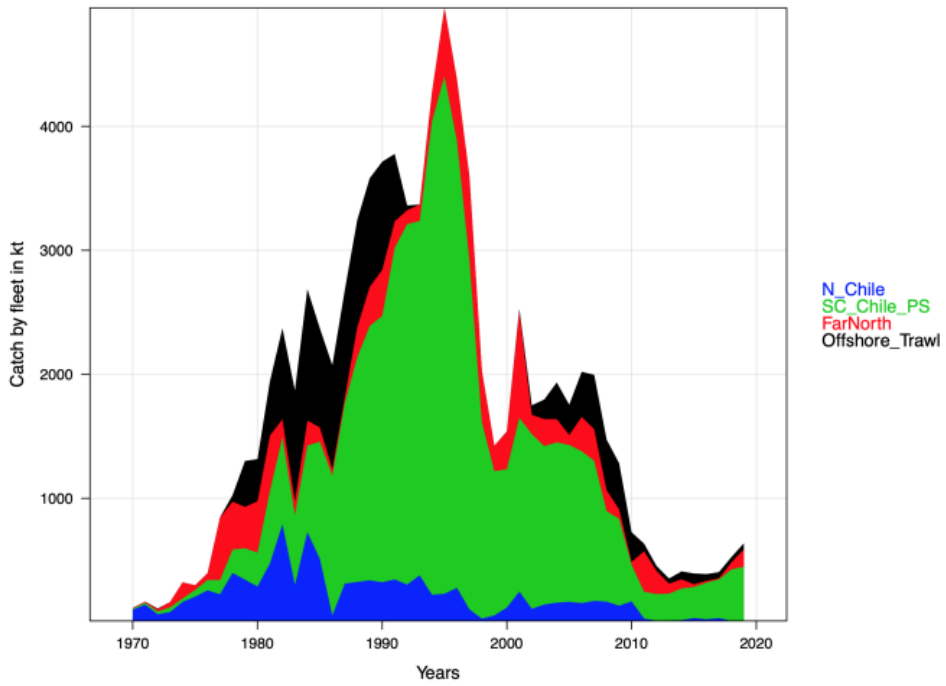



**Figure 4**. Catch of Jack mackerel by fleet. Green is the SC Chilean fleet, black is the offshore trawl fleet, red is the far north fleet, and blue in the northern Chilean fleet. SOURCE: SPRFMO-SC7

Length data are available from all major fisheries both inside and outside the EEZs. Length distributions from Chile and the older international fleet were converted into age distributions using annual Chilean age-length keys. The more recent length

composition data from China and EU were converted to age compositions by applying Chilean age-length keys as compiled by quarter of the year and then aggregated. Therefore, Fishery removals of the species in the fishery under assessment are included in the stock assessment process.

**C1.2 The species is considered, in its most recent stock assessment, to have a biomass above the limit reference point (or proxy), OR removals by the fishery under assessment are considered by scientific authorities to be negligible.**

Reference points remain as in previous assessment. $B_{MSY}$ is temporarily fixed at 5,500,000 tonnes and is used to determine the status of the stock; another $B_{MSY}$ (identified as SS $B_{MSY}$ in the SPRFMO report), dynamic and estimated annually, is at 4,328,000 tonnes and $F_{MSY}$, also dynamic, is at 0.12 (SPRFMO 2019a). The estimated increase in biomass to reach $B_{MSY}$, resulted from the fishing mortality rates decreasing in the past three years to 0.08 in 2019 and well below $F_{MSY}$, along with the slight recruitment improvement. Catches are preliminarily reported at 637,811 tonnes in 2019 for the whole assessment unit, rising in the last five years (SPRFMO 2019b). Therefore, the stock is above limits reference points. (Figure 5).

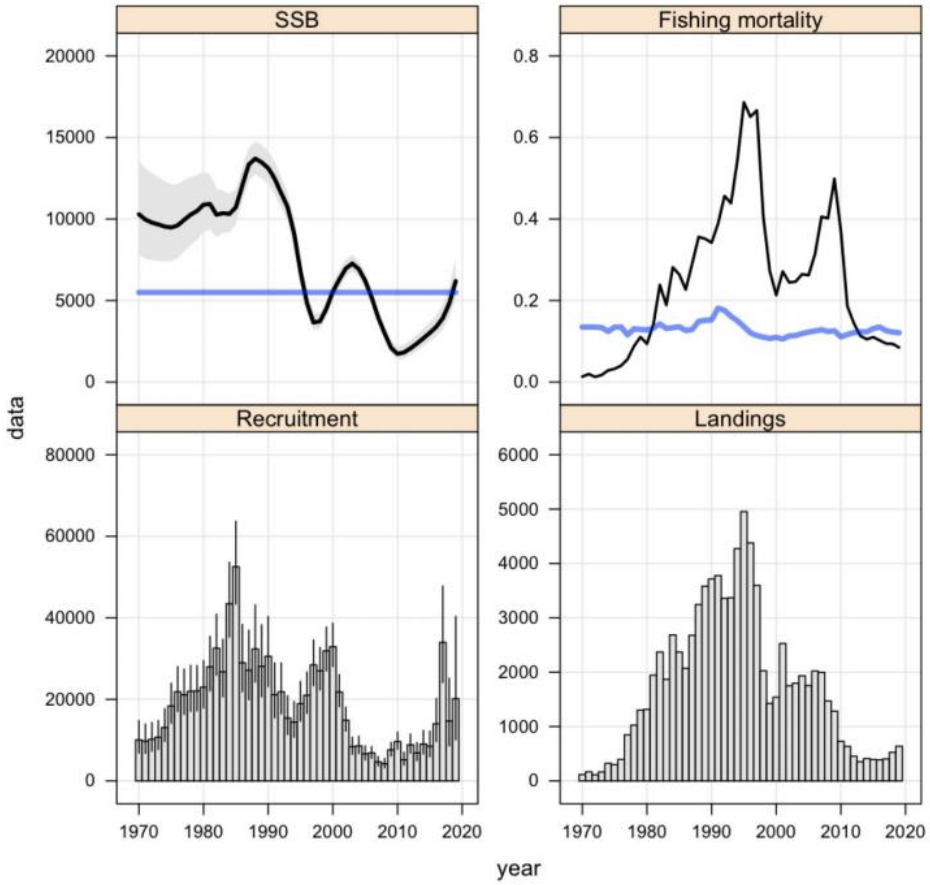



**Figure 5.** Model 1.00—single-stock hypothesis—summary estimates over time showing spawning biomass (kt; top left), recruitment at age 1 (millions; lower left) total fishing mortality (top right) and total catch (kt; bottom right). Blue lines represent the provisional $B_{MSY}$ (upper left) and dynamic estimates of FMSY (upper right). SOURCE: SPRFMO-SC7

**References**


- SUBPESCA 2020, Programa de seguimiento de las principales pesquerías pelágicas de la zona norte de Chile, Regiones de Arica Parinacota y Coquimbo, año 2019.
- IFOP 2021. Estado actual de las principales pesquerías chilenas, 2020.
- SPRFMO. 2019d. 7th Scientific Committee Report - Annex 8. Jack Mackerel Technical Annex Rev1/1. SPRFMO. 7-12 October 2019 Havana, Cuba. 51 pp. SPRFMO. https://www.sprfmo.int/assets/2019-SC7/Reports/SC7-Report-Annex-8-JM-Tech-Annex-Rev1.pdf


| **Links** | |
|---|---|
| **MARINTRUST Standard clause** | 1.3.2.2 |
| **FAO CCRF** | 7.5.3 |
| **GSSI** | D.3.04, D5.01 |

| Species Name | Humboldt squid *Dosidicus gigas* | |
|---|---|---|
| **C1** | **Category C Stock Status - Minimum Requirements** | |
| **C1.1** | Fishery removals of the species in the fishery under assessment are included in the stock assessment process, OR are considered by scientific authorities to be negligible. | Yes |
| **C1.2** | The species is considered, in its most recent stock assessment, to have a biomass above the limit reference point (or proxy), OR removals by the fishery under assessment are considered by scientific authorities to be negligible. | Yes |
| | **Clause outcome:** | PASS |

**C1.1 Fishery removals of the species in the fishery under assessment are included in the stock assessment process, OR are considered by scientific authorities to be negligible**.

Catch data of Humboldt squid in the Southeast Pacific Ocean during 2003~2015 were derived from Food and Agriculture Organization (FAO) of United Nation (UN) database. Also, the catch by different fishing entities occurred throughout the whole fishing ground in Southeast Pacific including EEZ of Peru and Chile as well as the adjacent international water, therefore catch data from Chile, Peru, China Japan, Korea, Chinese Taipei and Ecuador are included in the stock assessment.

Therefore, fishery removals of the stock complex are included in the stock assessment process, so the stock complex **PASSES** Clause C1.1.

**C1.2 The species is considered, in its most recent stock assessment, to have a biomass above the limit reference point (or proxy), OR removals by the fishery under assessment are considered by scientific authorities to be negligible**

The projections show uncertainties due to the fact that there is no information about size composition or stock structure, the Kobe plot (B/Bmsy) and (F/Fmsy) in different scenarios showed similar patterns.

The fishing mortality has increased over the exploited history however the fishery is not subject to overfishing or the stock is overfished. According the Kobe plot, the stock being overfishing or overfished had never happened since 2003 (Figure **6**).

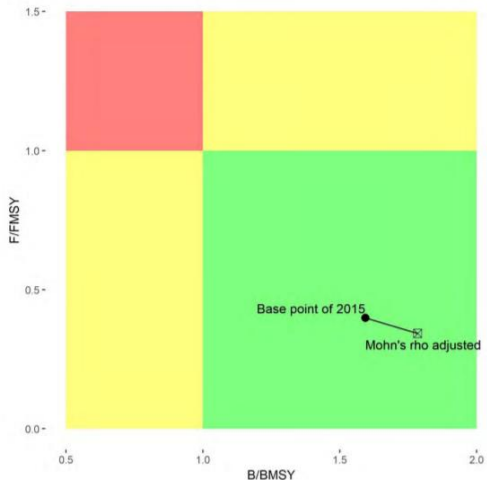



Figure 6. Base point of stock status of terminal year by base scenario of production model and the adjusted value based on Mohn's rho of fishing mortality and biomass (Source: Luoliang, X., et al. 2017).

The species is considered, in its most recent stock assessment, to have a biomass above the limit reference point so the stock complex **PASSES** Clause C1.2

**References**

Luoliang Xu, Bai Li, Gang Li, Xinjun Chen & Yong Chen, (2017). A Stock assessment of the jumbo flying squid (Dosidicus gigas) in Southeast Pacific Ocean. 5th Meeting of the Scientific Committee Shanghai, China. 23 - 28 September 2017. SC5-SQ02

| Links | |
|---|---|
| **MARINTRUST Standard clause** | 1.3.2.2 |
| **FAO CCRF** | 7.5.3 |
| **GSSI** | D.3.04, D5.01 |

| **Species Name** | **Pacific Chub mackerel *Scomber japonicus peruanus*** | |
|---|---|---|
| **C1** | **Category C Stock Status - Minimum Requirements** | |
| **C1.1** | Fishery removals of the species in the fishery under assessment are included in the stock assessment process, OR are considered by scientific authorities to be negligible. | Yes |
| **C1.2** | The species is considered, in its most recent stock assessment, to have a biomass above the limit reference point (or proxy), OR removals by the fishery under assessment are considered by scientific authorities to be negligible. | Yes |
| | **Clause outcome:** | PASS |

**C1.1 Fishery removals of the species in the fishery under assessment are included in the stock assessment process, OR are considered by scientific authorities to be negligible**.

Fishery-dependent data are collected when catch is landed and on-board vessels at sea and include effort data. Landings data are collected by the international surveillance company SGS, and include date and location of catch, plus size frequency sampling.

Consequently, fishery removals of the species in the fishery under assessment are included in the stock assessment process so the stock complex **PASSES** clause C1.1.

**C1.2 The species is considered, in its most recent stock assessment, to have a biomass above the limit reference point (or proxy), OR removals by the fishery under assessment are considered by scientific authorities to be negligible.**

IMARPE Report No 1071-2019 (Stock situation and perspectives for the 2020 Pacific Chub Mackerel fishery) was released in Dec 2019. The maximum biomass (2019) from surveys was in October (791,000t), an increase of 58% by volume when compared with values calculated from the March surveys and the highest values obtained since the summer surveys of 2017.
However, no new stock assessment has been published yet the RESOLUCIÓN MINISTERIAL Nº 00016-2021-PRODUCE has defined the TAC for Pacific Jack Mackerel (*Scomber japonicus peruanus*) for the fishing season 2021 at 68,081t. Following the last stock assessment, these removals would not exceed the reference point of 50% that $SSB_{2021} < SSB_{2020}$.

Therefore, the species is considered, in its most recent stock assessment, to have a biomass above the limit reference point (or proxy) so the stock complex **PASSES** clause C1.2.

**References**

El Peruano - Establecen límites de captura de los recursos Jurel y Caballa para el período 2021 y dictan disposiciones - RESOLUCION MINISTERIAL - Nº 00016-2021-PRODUCE - PODER EJECUTIVO - PRODUCE

https://www.fishsource.org/stock_page/1647

| Links | |
|---|---|
| **MARINTRUST Standard clause** | 1.3.2.2 |
| **FAO CCRF** | 7.5.3 |
| **GSSI** | D.3.04, D5.01 |

# CATEGORY D SPECIES

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. 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.

| D1 | Species Name | Longnose anchoveta *Anchoa nasus* | |
|---|---|---|---|
| | **Productivity Attribute** | **Value** | **Score** |
| | Average age at maturity (years) | 0.5 | 1 |
| | Average maximum age (years) | 1.6 | 1 |
| | Fecundity (eggs/spawning) | >10,000 | 1 |
| | Average maximum size (cm) | 17 | 1 |
| | Average size at maturity (cm) | 5.8 | 1 |
| | Reproductive strategy | Broadcast spawner | 1 |
| | Mean trophic level | 3.5 | 3 |
| | | **Average Productivity Score** | **1.29** |
| | **Susceptibility Attribute** | **Value** | **Score** |
| | Overlap of adult species range with fishery | <25% | 1 |
| | Distribution | Not used | - |
| | Habitat | Not used | - |
| | Depth range | 0-142m | 3 |
| | Selectivity | Up to 4m in length | 3 |
| | Post-capture mortality | Short tows | 2 |
| | | **Average Susceptibility Score** | **2.25** |
| | | **PSA Risk Rating (From Table D3)** | **PASS** |
| | | **Compliance rating** | **PASS** |

**References**

**FAO Fisheries Report No. 291, Volume 3 Batch fecundity and spawning frequency of various anchovetas p 419 http://www.fao.org/tempref/docrep/fao/005/x6851b/x6851b18.pdf

**Figure 7.** Fishbase Longnose anchoveta, *Anchoa nasus*, distribution

*Standard clauses 1.3.2.2*

# Table D2 - Productivity / Susceptibility attributes and scores.

| D1 | Species Name | South American pilchard *Sardinops sagax* | |
|---|---|---|---|
| | **Productivity Attribute** | **Value** | **Score** |
| | Average age at maturity (years) | 2.2 | 2 |
| | Average maximum age (years) | 8.6 | 1 |
| | Fecundity (eggs/spawning) | 25,495 | 1 |
| | Average maximum size (cm) | 39.5 | 1 |
| | Average size at maturity (cm) | 19.7 | 1 |
| | Reproductive strategy | Broadcast spawner | 1 |
| | Mean trophic level | 2.8 | 2 |
| | | **Average Productivity Score** | **1.28** |
| | **Susceptibility Attribute** | **Value** | **Score** |
| | Overlap of adult species range with fishery | <25% | 1 |
| | Distribution | Not used | - |
| | Habitat | - | - |
| | Depth range | 0-200 m | 3 |
| | Selectivity | >2 times mesh | 3 |
| | Post-capture mortality | Short tows | 2 |
| | | **Average Susceptibility Score** | **2.25** |
| | | **PSA Risk Rating (From Table D3)** | **PASS** |
| | | **Compliance rating** | **PASS** |

**References**

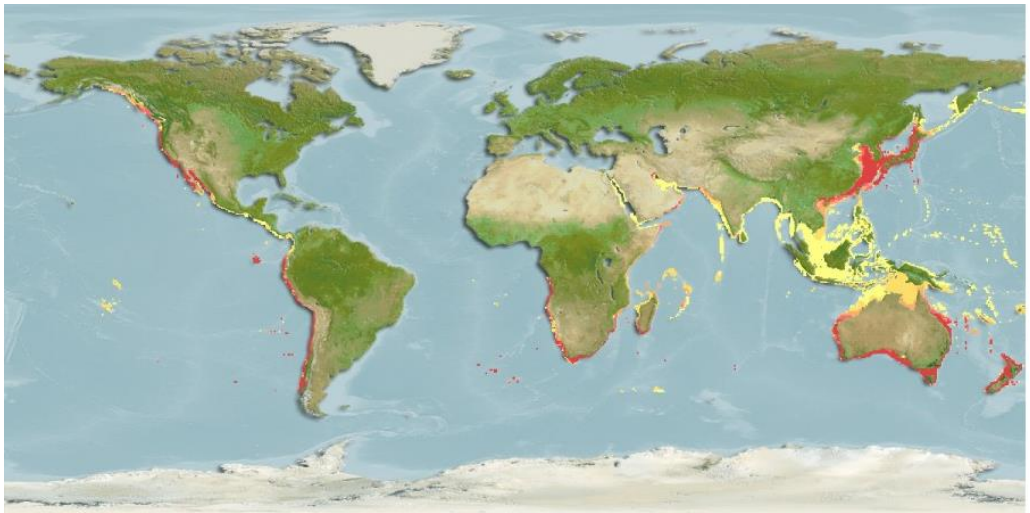


**Figure 8.** Fishbase South American pilchard*, Sardinops sagax*, distribution

*Standard clauses 1.3.2.2*

| Productivity attributes | Low productivity/ High risk | Medium productivity/ Medium risk | High productivity/ Low risk |
|---|---|---|---|
| | Score 3 | Score 2 | Score 1 |
| Average age at maturity (years) | >4 | 2 to 4 | <2 |
| Average maximum age (years) | >30 | 10 to 30 | <10 |
| Fecundity (eggs/spawning) | <1 000 | 1 000 to 10 000 | >10 000 |
| Average maximum size (cm) | >150 | 60 to 150 | <60 |
| Average size at maturity (cm) | >150 | 30 to 150 | <30 |
| Reproductive strategy | Live bearer, mouth brooder or significant parental investment | Demersal spawner "berried" | Broadcast spawner |
| Mean trophic level | >3.25 | 2.5–3.25 | <2.5 |

| Susceptibility attributes | | High susceptibility/ High risk | Medium susceptibility/ Medium risk | Low susceptibility/ Low risk |
|---|---|---|---|---|
| | | Score 3 | Score 2 | Score 1 |
| Availability | 1) Overlap of adult species range with fishery | >50% of stock occurs in the area fished | Between 25% and 50% of the stock occurs in the area fished | <25% of stock occurs in the area fished |
| | 2) Distribution | Only in the country/ fishery | Limited range in the region | Throughout region/ global distribution |
| Encounterability | 1) Habitat | Habitat preference of species make it highly likely to encounter trawl gear (e.g. demersal, muddy/sandy bottom) | Habitat preference of species make it moderately likely to encounter trawl gear (e.g. rocky bottom/reefs) | Depth or distribution of species make it unlikely to encounter trawl gear (e.g. epi-pelagic or meso-pelagic) |
| | 2) Depth range | High overlap with trawl fishing gear (20 to 60 m depth) | Medium overlap with trawl fishing gear (10 to 20 m depth) | Low overlap with trawl fishing gear (0 to 10 m, >70 m depth) |
| Selectivity | | Species >2 times mesh size or up to 4 m length | Species 1 to 2 times mesh size or 4 to 5 m length | Species <mesh size or >5 m length |
| Post capture mortality | | Most dead or retained Trawl tow >3 hours | Alive after net hauled Trawl tow 0.5 to 3 hours | Released alive Trawl tow <0.5 hours |

**Note:** Availability 2 is only used when there is no information for Availability 1; the most conservative score between Encounterability 1 and 2 is used.

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

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

**Evidence**

**D4.1: The potential impacts of the fishery on this species are considered during the management process, and reasonable measures are taken to minimise these impacts.**

**D4.2 There is no substantial evidence that the fishery has a significant negative impact on the species.**

**References**

| Links | |
|---|---|
| MARINTRUST Standard clause | 1.3.2.2, 4.1.4 |
| FAO CCRF | 7.5.1 |
| GSSI | D.5.01 |

# 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. | Yes |
| | F1.2 | There is no substantial evidence that the fishery has a significant negative effect on ETP species. | Yes |
| | F1.3 | If the fishery is known to interact with ETP species, measures are in place to minimise mortality. | Yes |
| | | **Clause outcome:** | PASS |

**F1.1 Interactions with ETP species are recorded.**

There is a national observer program in place for the pelagic fisheries which reports incidental catches however, it is not clear if those incidental catches recorded are all the possible interactions with ETPs species. PRODUCE resolutions do not specified what is considered incidental catches and there is no evidence of recording ETPs.

However, as part of the commitments to the FIP project it has been developed a private observer programme. The "SALVAMARES" Observer Programme, is a private sector initiative to provide information on fleet interaction with protected and endangered species and those caught as incidental by-catch. All interactions with ETPs are recorded in a logbook that is reported to IMARPE but exclusively from the vessels that are part of SNP which are involved in the SALVAMARES project. Therefore, it is recommended that information coming from the vessel targeting anchoveta that are not included in the private initiative should be improved.

Therefore, interactions with ETP species are recorded and fishery **PASSES** Clause F1.1.

**F1.2 There is no substantial evidence that the fishery has a significant negative effect on ETP species.**

The latest ''SALVAMARES' report (2019) posted on the CeDePesca website summarised information from a total of 48 observed trips (9.8% of total trips undertaken from 28 April – 01 August 2019).

Interactions with seabirds, marine mammals and reptiles were quantified. Interactions reported in the programme don't mean necessarily in harm or mortality for such species and, indeed, such impacts occur with low frequency.

Regarding interactions with marine mammals, mortality rate was very low. In a total of 3,146 set observed the total number of common dolphin (*Delphinus capensis)* observed was 12 with one death, 7 released alive and the rest which escape themselves.

A total of 7,612 Southern fur seals (*Arctocephalus australis)* were observed among which 2 died and the rest which escape themselves. South American sea lions (*O. flavescens*) were also observed in high percentage related to other marine mammals. A total of 125,306 sea lions were observed but 53 deaths were reported; 1664 were released alive and the rest of the observed sea lions escaped themselves with no harm reported.

Regarding sea birds, the results from the projections used for the whole fleet indicate that interactions were negligible. The species with higher percentage of sightings were: the Peruvian booby (*Sula variegata*), the blue-footed booby (*Sula nebouxii*), the Peruvian pelican (*Pelecanus thagus*) and the guanay cormorant (*Phalocrocorax bougainvilii*).

Analysing each population, there is no substantial evidence that fishery have significant negative impacts. The population size of blue footed booby population is around 2million. In the case of Peruvian boobies, of a total of 149,452 individuals observed, 398 died during the fishing operations, which represents approximately 0.3 % of total individuals observed.

A total of 100 Peruvian Pelicans were caught but released alive from 115,554 individuals observed, pelican populations are in increasing trend in the area and the mortalities from the fleet do not exceed 0.02 % of the individuals observed.

A total of 178,495 guanay cormorant (*Phalocrocorax bougainvilii*) were observed among which 809 deaths were reported representing 0.45% of the total. Total population of this species is estimated at 3.7 million individuals. CeDePesca report (2019) "Ficha de impacto de la pesquería de anchoveta sobre especies de by-catch y protegidas" has shown that indirect fishery impact could be a reason of decreasing their population but because food limitation rather than the mortalities occurred by the fishing operations. Even though, an estimation consumption of anchoveta by these species have been calculated and considered in perdition models, therefore although it is still a challenge for the fishery to provide a higher coverture of the observer programme that will allow to get a better estimation of the direct impacts, the mortalities reported are low enough to represent a significant negative impact (Birdlife international 2018. **R38-R39**).

For many other species, identification to species level was not possible by the Salvamares, and they were identified to family level, such as albatross, tern etc.

In relation to marine reptiles, two species of turtle interacted with the fishery, the Olive Ridley turtle (*Lepidochelys olivacea*), and the Green turtle (*Chelonia mydas*). All the individuals were released alive.

Therefore, there is no substantial evidence that the fishery has a significant negative effect on ETP species and it **PASESS** Clause F1.2

**F1.3 If the fishery is known to interact with ETP species, measures are in place to minimise mortality**.

There are measures in place to minimise the impacts on ETPs species even more since there is a FIP project in place. A release-kit and training program are being rolled out. Also, crew of 48 vessels have been trained to identify ETPs species mostly seabirds under the SALVAMARES programme and to report correctly the interactions with those species classified under this category.

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. The aim of the regulation is to protect coastal habitats and breeding zones for several species. Recently, in designated areas, a permanent spatial closure of 3nm along the Peruvian coastline for all fleet was established. Further, season fishing restrictions are in place to protect juveniles and also breeding seasons for seabirds.

Another threat posed by the fishery to ETP species is the key role of the species in the ecosystem, therefore, anchoveta is an important prey for a range of ETP species. In their stock assessment reports IMARPE highlight the difficulties of predicting environmental variability due to el Niño and other events and note that focus should be on preservation of the resilience of key species in the ecosystem, such as anchoveta. In the report "*Ficha de impacto de la pesquería de anchoveta sobre especies de by-catch y protegidas*" estimation of consumption of each species have been analysed to guaranty the tones needed are considered when a TAC is allocated every fishing season.

Therefore, there are measures in place to minimise mortality of ETP species and the fishery **PASSES** Clause F1.3.

**References**

Report No 3 (2019 12pp) PROGRAMA "SALVAMARES" Onboard observer reports: https://cedepesca.net/wp-content/uploads/2020/01/2019-10-16_Report-of-the-Private-Observer-Program-on-board.pdf
Ficha de impacto de la pesquería de anchoveta sobre especies de by-catch y protegidas. http://cedepesca.net/wp-content/uploads/2018/04/CeDePesca_Fichas-de-impacto-de-la-pesquer%C3%ADa-de-anchoveta-2017-11-29.pdf
BirdLife International. 2018. *Sula nebouxii*. The IUCN Red List of Threatened Species 2018: e.T22696683A132588719. https://dx.doi.org/10.2305/IUCN.UK.2018-2.RLTS.T22696683A132588719.en.BirdLife

| |
|---|
| International. 2018. *Sula variegata*. The IUCN Red List of Threatened Species 2018: e.T22696686A132589026. https://dx.doi.org/10.2305/IUCN.UK.2018-2.RLTS.T22696686A132589026.en |

| **Links** | |
|---|---|
| **MARINTRUST Standard clause** | 1.3.3.1 |
| **FAO CCRF** | 7.2.2 (d) |
| **GSSI** | D4.04, D.3.08 |

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

**F2.1 Potential habitat interactions are considered in the management decision-making process.**

The gear type is purse seine, the vertical distribution shown in previous IMARPE reports have defined the potential area of interaction with the water column at up to 10 m of depth. There is unlikely impact on benthic habits with purse seine fishing gear.

Technical measures are published on the PRODUCE website through Ministerial Resolutions (Resolución Ministeriales). Those measures designed to protect habitats and Vulnerable Marine Ecosystems (coral reefs, mangrove forests) include restricting industrial fishing operations to 5 nautical miles from the coast; Marine Protected Area (MPA's) are in operation (F1.3). New entrants to the fishery are prohibited.

Therefore, potential habitat interactions are considered in the management decision-making process and the fishery **PASSES** Clause F2.1.

**F2.2 There is no substantial evidence that the fishery has a significant negative impact on physical habitats.**

Data was provided (SALVAMARES Report 2019) from observed fishing trips on the sediment type remaining on nets after hauling, resulting from incidental interaction with the seabed. Observers reported a total number of interactions with sea beds in 147 shallow water inlets (5% by number of total inlets fished). Sediments observed on the nets after fishing operations included mud, sand and rock.

Therefore, the fishery has been deemed to have low risk to habitats. However, there have been difference in the data reported by the private observer programme and the national observer programme. Interactions with seabed have been slightly presented in different ways. Quality of data collected on habitats impacts should be improved and more information about VMEs geographical distribution should be collected. However, new measures to limit fishing operations in shallow water (5nm for industrial fleet) provide support to confirm that the fishery does not damage the seafloor.

There is no substantial evidence that the fishery has no significant negative impact on physical habitats and the fishery **PASSES** Clause F2.2.

**F2.3 If the fishery is known to interact with physical habitats, there are measures in place to minimise and mitigate negative impacts.**

From October 2018 the Government made available VMS data from the fleets to the Global Fishing Watch (GFW) application. Vessels from both industrial fleets are included. Mandatory vessel monitoring systems (VMS) are in place, as required by

PRODUCE Decrees Nº10/2010, Nº5/2012 and Nº01/2013. The electronic/radio log is required as well for the fishery (PRODUCE 2016a).
Any violation of entry into Marine Protected Areas and Vulnerable Marine Ecosystems for fishing operations are prosecuted. Results of these prosecutions are published on the PRODUCE website (R16). However, it would be useful to provide a map of VMEs along the Peruvian coast and overlay the fishery footprint to support that the fishery does no operate on any VMEs. SALVAMARES report has shown that only the 0.5% of the trawls observed presented interactions with the seafloor.

Therefore, the measures already implemented in the fishery to monitor the fishing areas are working but there is still an information gap in the definition of encountered habitats that should be improved with mapping the vulnerable areas.

Therefore, there are measures in place to minimise and mitigate negative impacts on habitats and fishery PASSES Clause F2.3

**References**

Report No 3 (2019 12pp) PROGRAMA "SALVAMARES" Onboard observer reports: https://cedepesca.net/wp-content/uploads/2020/01/2019-10-16_Report-of-the-Private-Observer-Program-on-board.pdf
Ficha de impacto de la pesquería de anchoveta sobre especies de by-catch y protegidas. http://cedepesca.net/wp-content/uploads/2018/04/CeDePesca_Fichas-de-impacto-de-la-pesquer%C3%ADa-de-anchoveta-2017-11-29.pdf
BirdLife International. 2018. *Sula nebouxii*. The IUCN Red List of Threatened Species 2018: e.T22696683A132588719. https://dx.doi.org/10.2305/IUCN.UK.2018-2.RLTS.T22696683A132588719.en.
BirdLife International. 2018. *Sula variegata*. The IUCN Red List of Threatened Species 2018: e.T22696686A132589026. https://dx.doi.org/10.2305/IUCN.UK.2018-2.RLTS.T22696686A132589026.en

| Links | |
|---|---|
| **MARINTRUST Standard clause** | 1.3.3.2 |
| **FAO CCRF** | 6.8 |
| **GSSI** | D.2.07, D.6.07, D3.09 |

| **F3** | **Ecosystem Impacts - Minimum Requirements** | | |
|---|---|---|---|
| | **F3.1** | The broader ecosystem within which the fishery occurs is considered during the management decision-making process. | Yes |
| | **F3.2** | There is no substantial evidence that the fishery has a significant negative impact on the marine ecosystem. | Yes |
| | **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. | Yes |
| | | **Clause outcome:** | PASS |

**F3.1 The broader ecosystem within which the fishery occurs is considered during the management decision-making process.**

Anchoveta 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 anchovetas; sardines or other LTL species alternate as the dominant species in the ecosystem.

Therefore, the broader ecosystem within which the fishery occurs is considered during the management decision-making process and the fishery **PASSES** Clause F3.1.

**F3.2 There is no substantial evidence that the fishery has a significant negative impact on the marine ecosystem.**

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

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

IMARPE stock assessment reports defined that main threat posed by this fishery consists of reduction of food availability to protected predator species (Gislason, 2003), as anchovy is a forage species. An inverse relationship was found between the anchoveta fishing mortality and populations of seabirds and pinnipeds. Also, a negative trend was observed for anchoveta landings from 1990 to 2012, what was also seen for other commercial species, which rely on anchoveta directly or indirectly through the trophic chain, underpinning the key role of anchoveta in Peruvian marine ecosystem.

Therefore, there is no substantial evidence that the fishery has a significant negative impact on the marine ecosystem and the fishery **PASSES** Clause F3.2. **R36**

**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.**

In the recent published stock assessment report, the fishery management have attempted to maintain the stock above a minimum biological reference point set up at 5 million t, which has been demonstrated throughout the time series to be a sufficient level to support the ecosystem.

IMARPE are currently attempting to quantify the actual needs of the ecosystem to add further evidence to this assumption. The information reported in the “Informe para el Proyecto de Mejoras de la Pesquería de Anchoveta CHI Stock Centro-Norte (PROME)” in order to understand the processes affecting the ecosystem impacts of fishing the low trophic level Peruvian anchovy in the Northern Humboldt Current Ecosystem, the recent ecosystem study has shown that the predators with more than 50 % of anchovy in their diets were boobies, cormorants, pelicans, bonitos, other large pelagic, sea lions, catfishes and fur seals. Predators with more than 2 t.km-2 y-1 of anchovy consumption were bonito, medium demersal, horse mackerels, other large pelagic and pacific mackerels.
The conclusions of those results were that depletion experiments varying levels of fishing mortality of adult Peruvian anchovy Northern-Central stock, using both ecosystem models (without and with environmental forcing), indicated that at the status quo fishing mortality (F = 0.784) and level of anchovy depletion (around 19 % B0), does not impact the abundance levels of more than 15 % of the other species and trophic groups by more than 40%, and also does not reduce the abundance level of any other species or trophic group by more than 70 % (OFICIO N° 309-2020-IMARPE/PE).

Further, in the last stock assessment some measures and advices were provided to avoid removals when it is considered that the juvenile fraction of the stock could be affected (sizes< 12 cm) such as fishing closures, closures areas, temporary bans among others as anchovy stock is closely monitored over the year. (Different resolutions: R. M. 477-2019-PRODUCE (04/11/2019); R. M. 483-2019-PRODUCE (19/11/2019); R. M. 544-2019-PRODUCE (20/12/2019); R. M. 552-2019-PRODUCE; R. M. 544-2019-PRODUCE).

Therefore, 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 and therefore the fishery **PASSES** clause F3.3.

**References**

Report No 3 (2019 12pp) PROGRAMA “SALVAMARES” Onboard observer reports: https://cedepesca.net/wp-content/uploads/2020/01/2019-10-16_Report-of-the-Private-Observer-Program-on-board.pdf
Ficha de impacto de la pesquería de anchoveta sobre especies de by-catch y protegidas. http://cedepesca.net/wp-content/uploads/2018/04/CeDePesca_Fichas-de-impacto-de-la-pesquer%C3%ADa-de-anchoveta-2017-11-29.pdf

| | |
|---|---|
| IMARPE 2020: North-central Peruvian anchovy stock (*Engraulis ringens*) situation during May 2020 and exploitation perspectives for the first 2020 fishing season.<br>Informe para el Proyecto de Mejoras de la Pesquería de Anchoveta CHI Stock Centro-Norte (PROME). OFICIO N° 309-2020-IMARPE/PE. Abril 2020 | |
| **Links** | |
| **MARINTRUST Standard clause** | 1.3.3.3 |
| **FAO CCRF** | 7.2.2 (d) |
| **GSSI** | D.2.09, D3.10, D.6.09 |

# 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]

# Glossary

**Non-target**: Species for which the gear is not specifically set, although they may have immediate commercial value and be a desirable component of the catch. OECD (1996), Synthesis report for the study on the economic aspects of the management of marine living resources. AGR/FI(96)12

**Target:** In the context of fishery certification, the target catch is the catch of stock under consideration by the unit of certification – i.e. the fish that are being assessed for certification and ecolabelling. (GSSI)

# Peer Review Report

## Fishery Assessment Peer Review Template

This section comprises a summary of the fishery being assessed against version 2 of the IFFO RS Standard.

| | |
|---|---|
| **Fishery under assessment** | Anchoveta (Engraulis ringens) Northern Border of Peruvian EEZ To 160 South |
| **Management authority (Country/State)** | Ministry of Production (PRODUCE) |
| **Main species** | Anchoveta (*Engraulis ringens*) |
| **Fishery location** | Northern Border of Peruvian EEZ to 160 South |
| **Gear type(s)** | Purse seine (industrial fleet) |

**Summary: in this section, provide any additional information about the fishery that the reviewers feel is significant to their decision.**

## Summary of Peer Review Outcomes

Peer reviewers should review the fishery assessment report with the primary objective of answering the key questions listed in the table below. Where the situation is more complicated, reviewers may instead answer "See Notes".

| | YES | NO | See Notes |
|---|---|---|---|
| **A – Fishery Assessment** | | | |
| | | | |
| 1. Has the fishery assessment been fully completed, using the recognised IFFO RS fishery assessment methodology and associated guidance? | | | x |
| 2. Does the Species Categorisation section of the report reflect the best current understanding of the catch composition of the fishery? | | | x |
| 3. Are the scores in the following sections accurate (i.e. do the scores reflect the evidence provided)? | | | |
| Section M - Management | x | | |
| Category A Species | x | | |
| Category B Species | x | | |
| Category C Species | x | | |
| Category D Species | x | | |
| Section F – Further Impacts | | x | |
| | | | |

## Detailed Peer Review Justification

Peer reviewers should provide support for their answers in the boxes provided, by referring to specific scoring issues and any relevant documentation as appropriate.

Detailed justifications are only required where answers given are one of the 'No' options. In other (Yes) cases, either confirm 'scoring agreed' or identify any places where weak rationales could be strengthened (without any implications for the scores).

Boxes may be extended if more space is required.

| 1. Is the scoring of the fishery consistent with the IFFO RS standard, and clearly based on the evidence presented in the assessment report? |
|---|

The assessment report seems to be adequate and in general, it provides the information necessary to justify the scores assigned to the different categories. This is a semi-pelagic fishery with relatively low impact on other species, habitat and (direct impact) on ecosystem.
I have several concerns about the certification of this fishery:

- My first concern is that anchoveta is a key species in the Peruvian ecosystem and the target reference point/s set by the IMARPE do not have any justification in relation to the needs of the ecosystem. The population of many seabirds (Guanay cormorants, Peruvian booby, etc) in the area have decreased from their historical levels and had never recovered. It seems that it could be a combined effect of the El Niño events and the fishing activity (Pikitch et al., 2012). Therefore, it is unclear if the fishery has an indirect impact on these species.

CB: More details below but the last study has shown that even though anchoveta has a LTL key role the populations dependent is not affected. Further, for i.e Guanay from 21,288 observations just 22 were reported as death. Zavalaga and Paredes (1999) estimated the population at 3.7 million individuals.

- My second concern is that the management undertaken by the IMARPE and the PRODUCE seem to be an industry-oriented management.

A clear harvest strategy for the fishery needs to be developed which take into consideration the key role of anchoveta in the Peruvian ecosystem.
CB: as PR mentioned below the research of Tam et al 2020 concluded that depletion experiments varying levels of fishing mortality of adult Peruvian anchovy N-C stock, using both ecosystem models, indicated that at the status quo fishing mortality and level of anchovy depletion; The fishery does not impact the abundance levels of more than 15% of the other species and trophic groups by more than 40%; and/or does not reduce abundance level of any other species or trophic group by more than 70%. Further, The harvest strategy is defined. harvest control rules have been defined and improved over the years to allow, in advance, fishery managers to respond to the stock assessment results in different scenarios and the relevant factors of oceanographic conditions. Further, fraction of juveniles is monitored and protected. The decision protocols define how managers might respond and how HCT may be applied in each season to respond to updated understanding of the situation of the stock. Therefore, the assessor believes there is a harvest strategy in place for this fishery.

2. Has the fishery assessment been fully completed, using the recognised IFFO RS fishery assessment methodology and associated guidance?

In general, the IFFO RS standard has been adequately applied to this assessment but please see my comments in the categorisation section and other relevant sections.

3. Does the Species Categorisation section of the report reflect the best current understanding of the catch composition of the fishery?

No, the species categorisation seems to be based on the IMARPE's 2017 Evaluación del Plan Operativo" (POI) and in a press release. The reference for the first report is not correct, I cannot access it and I could not double-check it. I think that the press release used is incorrect, it refers to the month of February 2019 and it seems to refer to overall fish landings in the country, and no to the industrial anchoveta fishery, which is the fishery assessed. To be totally honest, I am a little surprised about the inclusion of the South American pilchard and the Humboldt squid in this fishery catch categorization. Chub mackerel is fine, and jack mackerel maybe. What about other species such as munida (*Pleuroncodes monodon*)? Please, double-check that the categorization really refers to the industrial fishery.

CB response: The categorisation of the species is based on the information provided by the client to MT. However, when information on catch composition is not available to the assessment team, the assessor seeks the information from different sources i.e press release from entities related to the fishery, stock assessment reports or previous reports posted on MT website as it is the case for this surveillance. The adequacy of the sources where catch composition can be documented are not explicitly defined on the guidelines for Whole fish reports. The species munida is reported in Salvamares observer program as one of the species that constitute the 0.03% of incidental catches, however, this species has not been reported in other reports as the FIP posted by CeDePesca or in previous reports. For more details in the catch composition for this report the CB encourage the PR to request the total catch composition in the application forms submitted to MT. The catches correspond to industrial fishery. The link to the POI has been corrected.

| 3M. Are the scores in "Section M – Management" clearly justified? |
|---|

Yes, a management system is in place for this fishery in Peruvian waters and there is an organisation responsible for collecting data and assessing the fishery.
However, I have some concerns:
M1.5 I know the role of the SNP in the fishery, but the justification for this point seems to be mainly based on that organization. Which other organizations are involved in the decision-making process in the fishery?
M1.6 I read some reports which pointed out that the decision-making processes for setting the annual catch limits in this fishery were not so transparent and that IMARPE was favouring the industry when recommending the TACs. Have you checked the results of that investigation? CB response: As it states in the report Peruvian State, in accordance with the commitments with SNP, will facilitate consultation and the effective participation of the industry, fishing workers, fishermen and other institutions and organizations, such i.e CeDePesca, IMARPE and PRODUCE, interested in decision-making process regarding the development of standards and policies related to fisheries management.

The second condition indicated in the list "*A target spawning biomass value between the 3 - 6 million tons associated with a risk less than 50% is selected*" is correct? I think it should state 5-6 million tons.
CB: the protocol establishes by IMARPE states these three requirements for the definition of the TACs. Although, the target reference point is set up at 5 million tonnes and it is what is followed to set up the maximum catches in every season.

M2.3 It is stated "*Most infractions relate to excess of juveniles onboard or fishing without prior notification*". Any idea about the number of infractions? Some authors have pointed out that management measures to reduce the catch of juveniles in the fishery are not being effective.
CB: The infractions are controlled by the regulation D.S. 027- 2003-PRODUCE. Further, PRODUCE published Legislative Decree No. 1393 that establishes measures to combat illegal activities in fishing. Likewise, at the beginning of 2019, PRODUCE published the Protocol (No. 054-2019-MP-FN) that aims to establish the procedure that must be developed in order to execute interdiction operations against the illegal activities referred to the extraction and illegal prosecution of aquatic species, arranged by the prosecutor in charge of the investment. However, as there are private companies who manage the control and surveillance of the activities, the assessment team cannot present a concrete number of infractions in recent years but it can be consulted in PRODUCE website: Registro de Sanciones de Pesca y Acuicultura (produce.gob.pe)

| 3A. Are the "Category A Species" scores clearly justified? |
|---|

Generally speaking the information provided seems to be adequate, but I have some concerns about which anchoveta assessment has been used to assess the state of the stock. I have some concerns about how the "harvest strategy" (if any) and the target reference points have been set (see my comments in the summary section). Some minor comments:

A1.1 It is not clear to me which IMARPE's report has been used to assess this section. You state*: "At the time of writing this report, the final report for 2021 was not available in IMARPE website.* ***Therefore, the results showed in 2020 were considered to draft this report.*** *As mentioned, in the last report from May 2020…"* What about the assessment published in November for the second 2020 fishing season (1118-2020-IMARPE/PE)?. Is it not considered relevant here? However, the information shown: "*IMARPE has determined that the total biomass of the north central stock amounts to 9,881 million tons.."* seems to refer to 2021. So, I understand that the 2021 report has been used then. Please, clarify that.

CB: At the time of writing the report just a summary of information published on April 23rd 2021 was available. Now, in June 2021 the report for April 2021 was already on posted and the report has been updated with the information from this recent report.

A2.2 I understand that "*biomass reference level* $SSB_{Ref}$" refers to $SSB_{target}$, isn't it? What I never find in the IMARPE's reports or PRODUCE statements is which environmental scenario is finally chosen.

CB: they state the three scenarios and follow the IMARPE recommendation where the exploitation rate cannot be higher than 0.35, therefore, the TAC is set up following the best scenario that allow to not to exceed that limit.

A2.3. The title used is in this section is incorrect, it should say "fishery removals". If I remember well, in the last two assessments (November 2020 and May 2021), IMARPE has recommended a precautionary exploitation rate of 0.30.

CB: Following the art.3 of Reglamento del Decreto Legislativo No 1048 in the decision-making process to define the TAC the exploitation rate must follow IMARPE's advice set up at 0.35.

A2.4 According to the information provided it seems that an external review of the stock assessment was not done until 2019, is that correct? This consultant's report about the Management Strategy Evaluation (MSE) is referenced anywhere?

CB: Reference is in the report and several reports as the last external evaluation of the FIP project for this fishery state that over recent years the management system has been reviewed on a continuous as the Government sought to rectify the issues that previously plagued the sector with over fishing, severe variations in annual harvests, illegal fishing, inadequate research for a fishery of the scale and intensity as is anchovy. Clearly, there is regular internal review and an occasional external review. All this information can be reviewed in the Evaluation of the implementation of the POI that is normally posted every semester.

A2.5 The assessment protocol from 2015 refers to the southern tock, the protocol for the northern-central has been updated in 2019 and 2020. My experience is that since PRODUCE has updated its website is more difficult to find the information (IMARPE's assessments, etc) there.

CB: Noted.

A3.1 It has been already explained in previous sections, but I would at least named here that this exploitation rate is used to set a TAC which is distributed between the industrial vessels.

CB: It is already mention in the report that the exploitation rate is set up at 0.35 but the assessor has included the PR note.

A3.3 The information shown here is interesting, but I am not entirely sure that it really justifies this clause. What about commenting that in some years the anchoveta fishing seasons have not been opened (mainly the second fishing season) or have been closed early to protect the stock?
CB: Noted and included in the report.

A4.1 In this case, the May 2020 report has been used to assess the stock, as I said previously, what about using the most recent November 2020 report?
CB: The assessor has updated the information to reflect the 2021 report posted on May after drafting this assessment.

| 3B. Are the "Category B Species" scores clearly justified? |
| --- |
| No Category B species identified |

| 3C. Are the "Category C Species" scores clearly justified? |
| --- |
| Three species, Jack mackerel, Pacific Chub mackerel and Humboldt squid, are assessed here. The information provided seems to be adequate for the two first species. Just a couple of comments:<br>Jack mackerel<br>C1.1. I do not know what SC means for SC Chilean fleet. Is it spelled out somewhere?<br>Chub mackerel<br>CB: Chilean South-Central fleet. Terminology used in the SPRFMO SC7-Report<br><br>C1.2 This last stock assessment is really that or just a stock estimate? Any reference point or proxy set for the stock in the report? Just a thought, is it really a Category C species or a Category D species?<br>CB: It is a category C species as SPRFMO SC-& has established a reference point SSB MSY at 5,500,00.<br><br>Humboldt squid<br>I think a new assessment was tried for Humboldt squid in 2019 (Zhou 2019) (although no information about stock status in regard to reference points was given). I am not sure if a three years old stock assessment (2017) for a squid species has any validity. Second, I do not think the IMARPE assesses this species but if you look at the IFOP assessment for Chilean waters it doesn't seem that the status of the species was so good in 2019. Third, in my opinion using "*Catch data derived from Food and Agriculture Organization (FAO) of United Nation (UN) database*" for a squid species is a complete waste of time.<br>CB: MT guidelines does not specify if using data from FAO are less value than other data, the guidelines states if removals are considered in the stock assessment and following the MT wording the response is that the stock passes clause C!.1, th3 adequacy of the sources are not evaluated in this clause. Further, MT does not specify the frequency of the stock assessment, so the assessor has taken the most recent information available. |

| 3D. Are the "Category D Species" scores clearly justified? |
| --- |
| Two species are assessed in this category: Longnose anchoveta and South American pilchard. The scores given are based on the information provided by the Fishbase website. Although I have not double-checked all the data shown, I understand that it is correct.<br>Important to keep in mind that in some years, longnose anchoveta can represent more than 35% of the catch (Gutierrez et al., 2000).<br><br>CB: Note |

| 3F. Are the scores in "Section F – Further Impacts" clearly justified? |
|---|
| Several concerns here.<br>F1.1"*Therefore, it is recommended that information coming from the vessel targeting anchoveta that are not included in the private initiative should be improved*". I agree.<br>F1.2 The number of death Southern fur seals and South American sea lions was exactly the same (53). It is a strange coincidence.<br>CB: It is a typo and it has been amended in the report. Thank you.<br><br>The report indicates: "*For many other species, identification to species level was not possible by the Salvamares, and they were identified to family level, such as albatross*". It is a concern that these species were not adequately identified, as some of them are endangered. I consider that the crew training programme needs to be improved.<br>CB: Agree and I think is something the fishery is working on , not just in Peru also in Chile an fisheries.<br>F1.3 Do you know that these protected areas represent less than 1% of the Peruvian EEZ?<br>CB: However, the measures is there, once again the assessor does not assess the adequacy of the data rather than the clause which does not the define a minimum to consider that as a good practice or enough evidence.<br><br>F2.2 "*However, there have been difference in the data reported by the private observer programme and the national observer programme*". Again it seems that data collection in this SALVAMARES program needs to be improved and it is not very reliable.<br>CB: The assessor believes that the information is improving also in collaboration with the FIP project, but it is a reality that the information might be more accurate or larger, but it is an evidence to achieve a pass for this clause.<br><br>F2.3 I think that there is also a device called "antifango" which used is prohibited by law.<br>CB: Yes, the regulations RD1615-2011-produce states that the use of this system is not allowed.<br><br>F3.2 I am not sure how you conclude: "*there is no substantial evidence that the fishery has a significant negative impact on the marine ecosystem and the fishery*" after stating: "*An inverse relationship was found between the anchoveta fishing mortality and populations of seabirds and pinnipeds. Also, a negative trend was observed for anchoveta landings from 1990 to 2012, what was also seen for other commercial species, which rely on anchoveta directly or indirectly through the trophic chain, underpinning the key role of anchoveta in Peruvian marine ecosystem*". Also in F1.2 "*CeDePesca report (2019) "Ficha de impacto de la pesquería de anchoveta sobre especies de by-catch y protegidas" **has shown that indirect fishery impact could be a reason of decreasing their population but because food limitation** rather than the mortalities occurred by the fishing operations*".<br>CB: However, the anchoveta may have a significant role on the ecosystem The information reported In order to understand the processes affecting the ecosystem impacts of fishing the low trophic level Peruvian anchovy in the Northern Humboldt Current Ecosystem, the recent ecosystem study has shown that the predators with more than 50 % of anchovy in their diets were boobies, cormorants, pelicans, bonitos, other large pelagic, sea lions, catfishes and fur seals. Predators with more than 2 t.km-2 y-1 of |

anchovy consumption were bonito, medium demersal, horse mackerels, other large pelagic and pacific mackerels.
The conclusions of those results were that depletion experiments varying levels of fishing mortality of adult Peruvian anchovy Northern-Central stock, using both ecosystem models (without and with environmental forcing), indicated that at the status quo fishing mortality (F = 0.784) and level of anchovy depletion (around 19 % B0), does not impact the abundance levels of more than 15 % of the other species and trophic groups by more than 40%, and also does not reduce the abundance level of any other species or trophic group by more than 70 % (OFICIO N° 309-2020-IMARPE/PE). Therefore, even though, more information may help to better understand the ecosystems needs, clause F3.2 is met.

F3.3 This is my main concern in this fishery. I do not think that this statement is correct: "*In the recent published stock assessment report, the fishery management have attempted to maintain the stock above a minimum biological reference point set up at 5 million t,* ***which has been demonstrated throughout the time series to be a sufficient level to support the ecosystem***". This level was taken by IMARPE from a graph which shows the relationship between spawning stock biomass of anchovy and the recruitment during 40 years but it has never been related to the needs of the ecosystem.
CB: The study mention above has taken this approach and it has shown that the fishery has not had negative impacts on the ecosystem (OFICIO N° 309-2020-IMARPE/PE).
Also "*IMARPE are currently attempting to quantify the actual needs of the ecosystem to add further evidence to this assumption. The results of the ecosystem modelling work* ***are due to be completed in March 2020***". March 2020 was more than 1 year ago. So, which are the results of this ecosystem modelling? Is that quite simple modelling undertook by Tam et al., 2020 or another one?
CB: Amended. The information has been included in the report.

Optional: General comments on the Peer Review Draft Report

References used:

Gutiérrez, M., Herrera, N., Peraltilla, S., Ñiquen, M. 2000. Las Operaciones Eureka: una aproximación a la abundancia de anchoveta en el período 1966-1982. Bol. Inst. Mar Perú, 19 (1-2): 83-102.

Mongabay Latam 2020. Crisis IMARPE: las posibilidades que se abren tras el mayor escándalo pesquero de los últimos años. Available at: https://es.mongabay.com/2020/02/peru-crisis-en-imarpe-oportunidades-tras-el-decreto-de-urgencia/

Pikitch, E., Boersma, P.D., Boyd, I.L., Conover, D.O., Cury, P., Essington, T., Heppell, S.S., Houde, E.D., Mangel, M., Pauly, D., Plagányi, É., Sainsbury, K., and Steneck, R.S. 2012. Little Fish, Big Impact: Managing a Crucial Link in Ocean Food Webs. Lenfest Ocean Program. Washington, DC. 108 pp. Available at: http://www.oceanconservationscience.org/foragefish/press/Little%20Fish%20Big%20Impact%20Summary.pdf

Tam J, M Taylor & M Ñique. 2020. Ecosystem impacts of fishing the low trophic level Peruvian anchovy in the Northern. Humboldt Current Ecosystem. IMARPE, Ministerio de la Producción. Available at: https://cedepesca.net/wp-content/uploads/2021/01/Tam-Ecosystem-impacts-2020.pdf

Zhou 2019. Using a size-structure model to assess the Jumbo flying squid in the equatorial waters. SC7-SQ07. 27 pp.

| |
|---|
| “Publically” is not correct, it should say “Publicly” . Corrected |