MarinTrust Standard V2

Whole fish Fishery Assessment

Anchovy (Engraulis ringens) in FAO 87, from 16° south to southern border

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Table 1 Application details and summary of the assessment outcome

Application details and summary of the assessment outcome			
Name(s): Austral Group S.A. A			
Country: Peru			
Email address:		**Applicant Code**	
Certification Body Details			
Name of Certification Body:		**NSF**	
Assessor Name	**CB Peer Reviewer**	**Assessment Days**	**Initial/Surveillance/ Re-approval**
Ana Elisa Almeida Ayres	Léa Lebechnech	2	Surveillance 2
Assessment Period	Up to August 2023		
Scope Details			
Management Authority (Country/State)	Ministry of Production (PRODUCE)		
Main Species	Anchovy (*Engraulis ringens*) [“*anchoveta*”, in Spanish] Eastern Pacific bonito (*Sarda chiliensis chiliensis*) [“*bonito*”, in Spanish] Chilean jack mackerel (*Trachurus murphyi*) [“*jurel*”, in Spanish] Chub mackerel (*Scomber japonicus*) [“*caballa*”, in Spanish] Carrot/red squat lobster (*Pleuroncodes monodon*) [“*munida*”, in Spanish]		
Fishery Location	FAO 87, from 16° south to southern border		
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	Approve		
Recommendation	APPROVED		

Table 2. Assessment Determination

Assessment Determination
Anchovy (*Engraulis ringens*) [“*anchoveta*”, in Spanish] is found throughout the south-eastern Pacific Ocean, ranging from Zorritos (4°30' S) in northern Peru to Chiloé (42°30' S) in southern Chile. Two stocks have been identified in Peruvian water: 1. The northern-central Peruvian stock, assessed and managed by Peru; 2. The southern Peru/northern Chile stock (this report), assessed and managed unilaterally by each country. In Chile, it corresponds to the regions of Arica and Parinacota, Tarapacá and Antofagasta (XV-II) The anchovy fishery is the largest monospecific fishery of the world. This report assesses the purse seine fishery of the anchovy fishery from 16° south to southern border of Peru. Most of data available for Peruvian anchovy fishery is from northern Peru, as there is a Fisheries Improvement Project (FIP) in place for its anchovy industrial purse-seine fishery. The species composition of the accompanying fauna is highly variable and influenced by environmental conditions, especially El Niño events. Upon examining previous reports, it was evident that usually each species within the accompanying fauna makes up approximately 0.1% to 2.5% of the total landings. For deciding which species would be included in this assessment, it was used the main species of accompanying fauna that in some point from 2023-2021 composed more than 0.1% of landings in southern Paru and from northern Chile, considering the proximity of this region and the shared stock condition (although the fisheries management is done separately by each country authority). Besides anchovy, these species were included in this assessment: Eastern Pacific bonito - *Sarda chiliensis chiliensis* (“*bonito*”, in Spanish), Chilean jack mackerel - *Trachurus murphyi* (“*jurel*”, in Spanish), Chub mackerel - *Scomber japonicus* (“*caballa*”, in Spanish) and Carrot/red squat lobster - *Pleuroncodes monodon* (“*munida*”, in Spanish). None of the species of this assessment is categorised as Endangered or Critically Endangered on International Union for Conservation of Nature's Red List of Threatened Species - IUCN’s Red List neither appears in the Convention on International Trade in Endangered Species of Wild Fauna and Flora – CITES appendices; therefore, all species were eligible for approval for use as MarinTrust Whole fish raw material. The Peruvian fishing sector is governed by the General Fisheries Law (LGP Law Nº 25977) and the highest authority is the Ministry of Production – PRODUCE (“*Ministerio de la Producción”,* in Spanish). Under PRODUCE, there is a Vice-ministerial Office of Fishery and Aquaculture. Marine Institute of Peru – IMARPE (“*Instituto del Mar del Perú*”, in Spanish) is an entity attached to the PRODUCE, which conducts scientific research and provides advice and technical support to the government on fisheries issues. Each year, fishing is divided into two seasons. Hydroacoustic surveys are conducted and environmental and biological data are collected by IMARPE before each fishing season. The stock is assessed based on these data and a Maximum Limit of Total Allowable Catch - LMTCP (“*Límite Máximo de Captura Total Permisible*”, in Spanish) is recommended. The implementation and enforcement of fisheries laws and regulations is one of the stated functions of PRODUCE, through the General Directorate of Supervision, Inspection and Sanction – DGSFS (“*Dirección General de Supervisión, Fiscalización y Sanción”,* in Spanish). Monitoring is conducted at sea by compliance observers and at port by PRODUCE. Third-party operators conduct landing operations verification at designated landing sites as well. The national observer program (“*Programa Bitácoras de Pesca* – PBP”, in Spanish), fishing and Landings Surveillance Program (PVCPDAM), Vessel Departure Control checks and the Satellite Surveillance System of fishing vessels (SISESAT) are used to monitor industrial fishing operations. The surveillance system is so strong, that is difficult not to comply. During the first fishing season of 2023 (From 05th January to 30th June), 25,372 tons of anchovy were landed in southern Peru, while in 2022, total landings were 264,000 tons. The catch of anchovy in the area is regulated through an annual Maximum Limit of Total Allowable Catch - LMTCP (“*Límite Máximo de Captura Total Permisible*”, in Spanish) set by PRODUCE based on the recommendations given by IMARPE. Different fishing parameters are estimated by IMARPE, including the maximum sustainable level - MSY, the biomass and the fishing mortality that will lead to the MSY (B_{MSY} and F_{MSY}, respectively). When the fishery reaches the LMTCP

established by the season, the fishery is closed. The LMTCP has been decided based on catches corresponded to 80% of MSY, which has not been surpassed this threshold in recent years. Since 2009 catches and fishing mortality have been below MSY and F_{MSY}. During the first 2023 fishing season, only 7.53% of LMTCP was taken. Temporal bans are also set to protect the stock when the number of juveniles in the catch surpasses a 10% limit.

Annual landings of Eastern Pacific bonito, Chilean jack mackerel and Chub mackerel, which were assessed under category C, are recorded and they all presented a biomass above the limit reference point in the most recent assessment. Carrot/red squat lobster, assessed under category D, passed the Productivity-Susceptibility Analysis (PSA).

In Peru, there are two onboard observer programs that report incidental catches in the pelagic fisheries (PBP and SALVAMARES). There are many interactions of anchovy fishery with Endangered, Threatened, Protected-ETP species, but the mortality rates are low and there are several measures in place to minimise the impacts on them.

The fishery does not have a significant negative impact on physical habitats as the gear used by the industry, purse seine, is pelagic, meaning that does not have a direct impact on the seabed.

Several management measures are in place to protect the species (temporally spawning and recruitment closures), Minimum Landing Size (MLS), catch's bycatch restrained to 5%, restricted areas and access to the fishery, updates on LMTCP according to fishing and environmental biological factors through the year, etc, which protect the environment and the species which rely on anchovy. Although anchovy is prey of several species, studies indicated that these species' dietary necessities have been adequately met in recent years and anchovy fishery is not exerting an adverse influence on species recovery.

The assessor recommends the approval of anchovy stock in FAO 87, from 16° south to southern border of Peru for the production of fishmeal and/or fish oil under the current MarinTrust Whole fish Standard (v 2.0).

Fishery Assessment Peer Review Comments

External peer reviewer comments are provided in full in Appendix B.

The assessment is comprehensive and very complete. Rationales used and scores seem to be broadly adequate. See my comments in section C and F. Only minor comments in the other sections.

Notes for On-site Auditor

None.

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	Anchovy (*Engraulis ringens)* [“anchoveta”, in Spanish]	~ 98	A1	Pass
			A2	Pass
			A3	Pass
			A4	Pass
Category C	Eastern Pacific bonito (*Sarda chiliensis chiliensis)* [“*bonito*”, in Spanish]	< 2	Pass	
Category C	Chilean jack mackerel (*Trachurus murphyi) [“jurel*”, in Spanish]	< 2	Pass	
Category C	Chub mackerel (*Scomber japonicus*) [*“caballa”*, in Spanish]	< 1	Pass	
Category D	Carrot/red squat lobster (*Pleuroncodes monodon*) [“*munida*”, in Spanish]	< 2	Pass	

Table 5 Species Categorisation Table

Common name	Latin name	Stock	IUCN Redlist Category[1]	% of landings	Management	Category
Anchovy ("*anchoveta*", in Spanish)	*Engraulis ringens*	Anchovy in FAO 87, from 16° south to southern of Peru stock FAO 87	LC	~98	Ministry of Production – PRODUCE	A
Eastern Pacific bonito ("*bonito*", in Spanish)	*Sarda chiliensis chiliensis*	Eastern Pacific bonito in FAO 87, from 16° south to southern of Peru stock FAO 87	LC	<2	Ministry of Production – PRODUCE	C
Chilean jack mackerel ("*jurel*", in Spanish)	*Trachurus murphyi*	Chilean jack mackerel in FAO 87, from 16° south to southern of Peru stock FAO 87	LC	<2	Ministry of Production – PRODUCE	C
Chub mackerel (*"caballa"*, in Spanish)	*Scomber japonicus*	Chub mackerel in FAO 87, from 16° south to southern of Peru stock FAO 87	LC	<1	Ministry of Production – PRODUCE	C
Carrot/red squat lobster ("*munida*", in Spanish)	*Pleuroncodes monodon*	Carrot/red squat lobster in FAO 87, from 16° south to southern of Peru stock FAO 87	LC	<2	Ministry of Production – PRODUCE	D

Species categorisation rationale

The Peruvian anchovy ("*anchoveta*", in Spanish) fishery is the largest monospecific fishery of the world. The species composition of the accompanying fauna is highly variable and influenced by environmental conditions, especially El Niño events. Upon examining previous reports, it becomes evident that typically, each species within the accompanying fauna makes up approximately 0.1% to 2.5% of the total landings. The Peruvian anchovy fishery reports usually only cite the name of species found during the expeditions and do not provide their amount, neither their percentage on total landings. It is hard to compile landings data as Peru publishes daily reports of the landings and rarely publish a report with compiled quantitative data of the accompanying fauna. Besides, most of Peruvian fishery reports published are based on data from anchovy fleets operating in northern border of Peruvian Exclusive Economic Zone (EEZ) to 16° south. However, the southern Peruvian anchovy stock is a shared stock with Chile and Chile has some reports with quantitative data of catches for its northern region, which will be used herein considering the proximity to southern Peru, although the fisheries management is done separately by each country authority. Therefore, for deciding which species would be included in this assessment, it was used the main species of accompanying fauna that in some point from 2023-2021 composed more than 0.1% of landings, based on the available reports from southern Peru and northern Chile.

During the 5-days-operation of EUREKA LXXIV in April 2023, Eastern Pacific bonito - *Sarda chiliensis chiliensis* ("*bonito*", in Spanish) seemed to be one of the main species of accompanying fauna identified from 16° south to southern border of Peru with Chile (IMARPE, 2023), followed by Chilean jack mackerel - *Trachurus murphyi* ("*jurel*", in Spanish) [Figure 1]. Thus, these species were included in the assessment. No quantitative data was provided for these species in this region in IMARPE[1] (2023) report. However, a percentage of 0.51% on catch composition for Chilean jack mackerel was reported from industrial fleets operating in March, April and June 2021 by IMARPE (2021) in south of Peru (Figure 2) and a percentage of 1.87% was provided from industrial fleets operating in northern Chile through 2021 year (IFOP, 2022) [Figure 3].

The Chilean authorities (IFOP, 2022) collected bycatch data for anchovy fishery in Chile from January to December 2021. The data showed that Chub mackerel - *Scomber japonicus* (*"caballa"*, in Spanish) also surpassed the 0.1% threshold in northern region, composing 0.83% of catches (Figure 3). Thus, this species was included in the assessment.

Data from IMARPE (2021) showed that Carrot/red squat lobster - *Pleuroncodes monodon* ("*munida*", in Spanish) surpassed 0.1% threshold as well, composing 1.28% of the catches and it was a dominant species on north of Pery (Figure 2). Therefore, this species was included in the assessment.

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

In conclusion, besides anchovy, which was assessed under Category A, these species were included in this assessment:

- Category C: Eastern Pacific bonito - *Sarda chiliensis chiliensis* ("*bonito*", in Spanish)
- Category C: Chilean jack mackerel - *Trachurus murphyi* ("*jurel*", in Spanish).
- Category C: Chub mackerel - Scomber japonicus ("caballa", in Spanish)
- Category D: Carrot/red squat lobster - *Pleuroncodes monodon* ("*munida*", in Spanish)

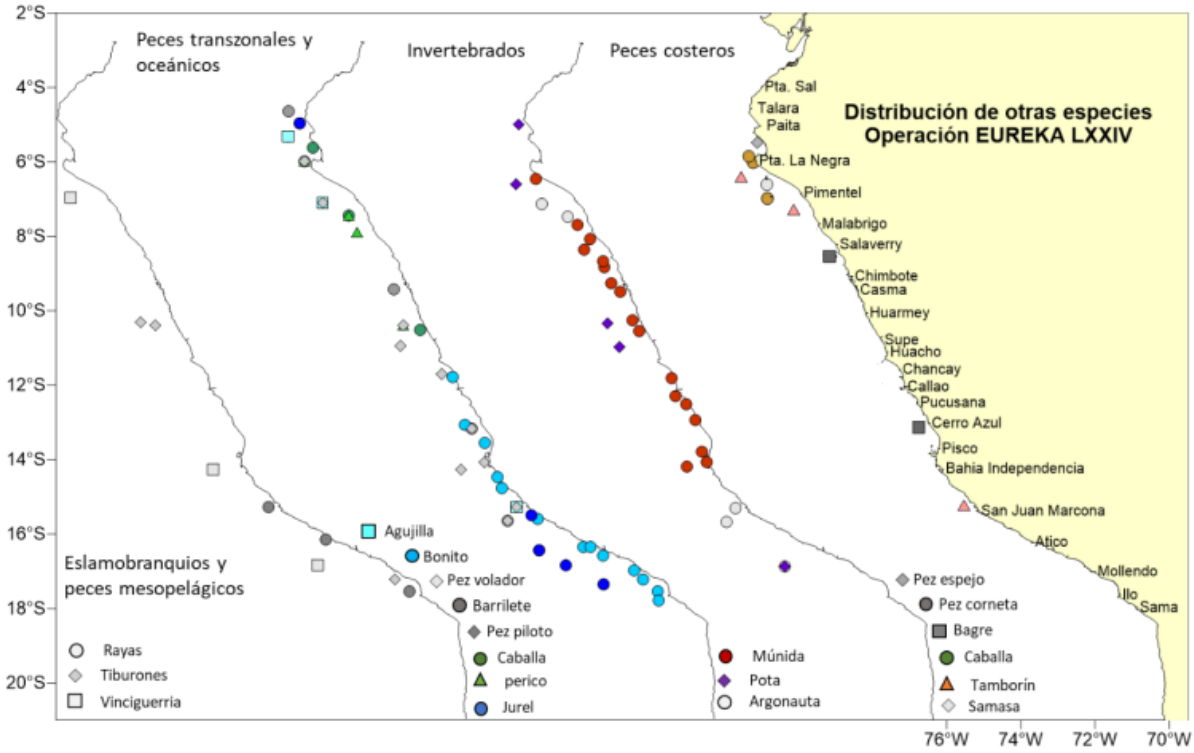

Figura 23. Distribución de otras especies durante la Operación Eureka LXXIV.

Figure 1. Distribution of species during EUREKA LXXIV operation from 17 to 21 April 2023 (IMARPE, 2023). The area covered by this assessment starts from 16° south to southern border Peru.

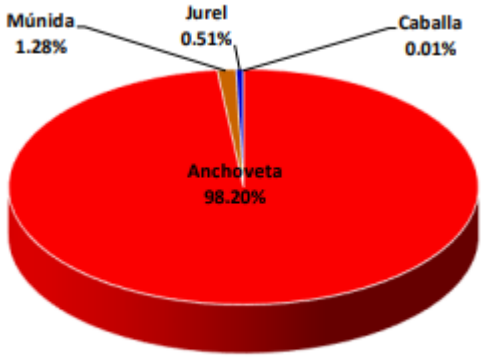

Figura 1. Composición por especie de las capturas.

Figure 2. Composition of species from industrial fleets operating in Southern Peru in March, April and June of 2021. (IMARPE, 2021).

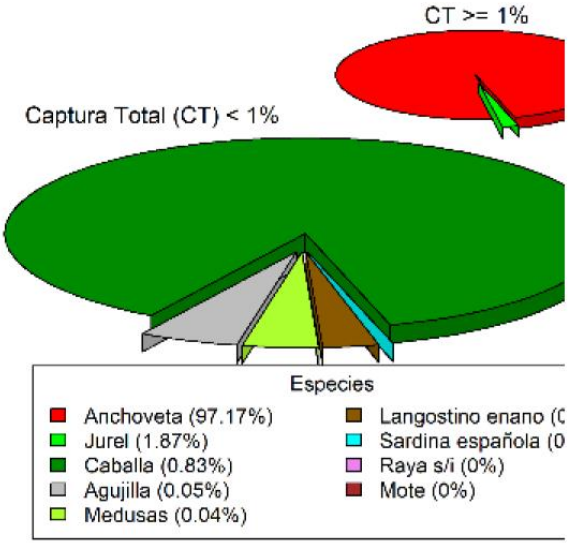

Figure 3. Catch composition of Chilean industrial fleet operating in Northern Chile (IFOP, 2022).

References

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IMARPE. 2023. Informe de la operación eureka lXXIV. (17 al 21 de abril de 2023). https://cdn.www.gob.pe/uploads/document/file/4641378/ANEXO-OF.%20525-2023-PCD-Informe%20final%20Eureka%20LXXIV-DGIOCC-DGIHSA.pdf?v=1685719506

IMARPE. 2021. Reporte primera temporada de anchovy sur 2021. Reporte del programa de observadores a bordo Bitácoras de pesca. http://www.imarpe.pe/imarpe/archivos/reportes/imarpe_reporte_anchoveta_1ra_temp_anch_sur_2021.pdf

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.

The Peruvian fishing sector is governed by the General Fisheries Law (LGP Law Nº 25977) promulgated on December 21, 1992, and the highest authority is the Ministry of Production – PRODUCE ("*Ministerio de la Producción*" in Spanish). Under PRODUCE, there is a Vice-ministerial Office of Fishery and Aquaculture.

PRODUCE formulate, design, execute and supervise the national and sectoral policy of fishing, aquaculture, micro and small business and industry. Regarding the fisheries sector, PRODUCE regulates the activity and promotes the harmonious development of the productive ecosystems of fisheries (Gob1, 2023).

Vice-ministerial Office of Fishery and Aquaculture responsibilities include the creation and implementation of management plans, the conduct of fisheries research, the establishment of the regulatory framework for fisheries management, and the issuance and administration of regulations. Through Ministerial Resolutions and Supreme Decrees, annual catch limits and technical measures governing the fishery are published on the PRODUCE website.

There is an organisation responsible for managing the fishery. M.1.1 is met.

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

Marine Institute of Peru – IMARPE ("*Instituto del Mar del Perú*" in Spanish) is an entity attached to PRODUCE, which conducts scientific research and provides advice and technical support to the government on fisheries issues. IMARPE is a specialized technical body, whose functions are oriented towards the generation of scientific knowledge that allows the Peruvian State to have scientific and timely advice for the sustainable use of the living resources of the sea and continental waters (Gob[2], 2023). IMARPE is responsible for conductions of stock assessments, recommendations of annual catches limits, establishment of temporary authorizations for the extraction of fishes, as well as maximum tolerance of juvenile specimens as bycatch.

Two to four scientific surveys encompassing the entire Peruvian coastline are conducted annually by IMARPE. Surveys collect oceanographic and environmental data, and are used to estimate total biomass, eggs and larvae production, anchovy population size structure, and reproductive status of the stocks. To address environmental variability, which is particularly influential in the Peruvian upwelling system, IMARPE employs remote sensing and in situ observations at sea and on land to conduct extensive and ongoing monitoring of the ecosystem. In addition, during atypical environmental conditions, a "Eureka" operation conducts hydroacoustic evaluation surveys with data acquired simultaneously by multiple industrial fishing vessels under the direction of IMARPE (Oliveros-Ramos et al., 2021).

Based on a predefined protocol, the IMARPE assess the stock and issues catch guidelines (IMARPE, 2015):

1. First, the stock size, structure, and biomass are estimated from the hydroacoustic surveys;
2. Size structure are projected under diverse circumstances (exploitation, growth, and mortality, which will vary according on anticipated environmental conditions during the projection period);
3. A decision table is built to recommend a Maximum Limit of Total Allowable Catch - LMTCP ("*Límite Máximo de Captura Total Permisible*", in Spanish), according to different scenarios

When population numbers are low, and the environment is unstable, further surveys are conducted. Although discards are not officially documented, they are indirectly factored into stock estimates via acoustic surveys and population length frequency statistics.

Oliveros-Ramos et al. (2021); Scott (2020) stated that fisheries management for the reduction fishery has significantly improved, and seasonal fishing closures are resulting in increased stock size and health of anchovy stocks.

Also, on September 9th, 2020, PRODUCE's General Directorate of Supervision, Inspection and Sanction – DGSFS ("*Dirección General de Supervisión, Fiscalización y Sanción*", in Spanish) issued Directive N° 061-2020-PRODUCE/DGSFS-PA, which set the rules for how PRODUCE will continue to share IMARPE information about illegal and unreported catches in the anchovy fishery. This information is used to come up with LMTCP recommendations for IMARPE.

There is an organisation responsible for collecting data and assessing the fishery. M.1.2 is met.

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

The LGP Law Nº. 25977, which is the most important law in the fishing sector, is based on sustainability as stated on its first article (Senace, 2023): "Article 1. The purpose of this Law is to regulate the fishing activity in order to promote their sustainable development as a source of food, employment and income and of ensure a responsible use of hydrobiological resources, optimizing the economic benefits, in harmony with the preservation of the environment and conservation of biodiversity."

In the description of PRODUCE and IMARPE in government website, the commitment to sustainability is explicitly mentioned:
PRODUCE
Gob[1](2023): "Our mission is to promote the development of agents in the productive sector, promoting innovation, quality and environmental sustainability, contributing to the competitiveness of the sector."

IMARPE
Gob[2] (2023): "We are a specialized technical body of the Ministry of Production, whose functions are oriented towards the generation of scientific knowledge that allows the Peruvian State to have scientific, truthful and timely advice for the sustainable use of the living resources of the sea and continental waters."

Fishery management organisations are publicly committed to sustainability. M1.3 is met.

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

PRODUCE was created by Law Nº. 27779 – 2002. The last regulation of the organization and roles of PRODUCE was approved by Supreme Decree 002-2017-PRODUCE (CDN[1], 2023).

The LGP Law Nº. 25977 is the most important law in the fishing sector and it was approved in 1992. The first major of this law was in 2008, through Legislative Decree 1027. This decree modified two articles related to PRODUCE to grant licenses for fishing activities, as following: "Article 9. The Ministry of Production, based on scientific evidence available and socioeconomic factors, determines, depending on the type of fisheries, the fisheries management systems, allowable catch quotas, seasons and zones of fishing, regulation of fishing effort, fishing methods, minimum sizes of capture and other regulations that require the preservation and rational exploitation of resources hydrobiological.

The administrative rights granted are subject to the ordering measures that, by means of a legal provision of a general nature, dictates the Ministry. (…)

Article 44. Concessions, authorizations and permits are specific rights that the Ministry of Production grants a specific term for the development of activities fishing activities, in accordance with the provisions of this Law and under the conditions determined by its Regulation.

It is the responsibility of PRODUCE to verify that the administrative rights granted are exercised in strict observance of the specifications set forth in the title itself granted as well as in accordance with the conditions and legal provisions issued, in

order to ensure that these are used in accordance with the interest of the Nation, the common good and within the limits and principles established in this law, in the special laws and in the norms regulations on the matter.

In case of non-compliance, the Ministry of Production, through the technical bodies corresponding, issues the administrative resolution of expiration of the right granted that allow its reversion to the State, prior to the initiation of the respective administrative procedure, which ensure respect for the right of defence of the administered and with strict subjection to due procedure."

The second major modification of the LGP Law Nº 25977 was in 2018, through Legislative Decree 1393, which regulates the interdiction of illegal fishing. This decree incorporated an article related to the enforceability of sanction resolutions imposed by PRODUCE.

The third and most recent modification was in 2023, through Law Nº 31749. This law, among other things, establishes provisions aimed at the legal protection of the first nautical miles.

Regarding IMARPE, the Legislative Decree Nº 95, modified by the Urgency Decree Nº 015-2020 (FAO, 2023), establishes: "Article. 1 Marine Institute of Peru – IMARPE:
Marine Institute of Peru - IMARPE, is a Specialized Technical Public Organization attached to the Ministry of Production, which has legal status under Internal Public Law. It constitutes a budget statement. (…)

Article 4. Roles of Marine Institute of Peru - IMARPE
Marine Institute of Peru - IMARPE, in accordance with the provisions of the previous articles, has the following roles:

a) Approve, execute and evaluate scientific and technological research plans, programs and projects, linked to its purpose;
b) Develop scientific research on marine and continental resources, the ecological factors of interaction and those that promote the development of fishing and aquaculture;
c) Develop oceanographic and limnological investigations of the Peruvian sea and continental waters respectively;
d) Develop technological research on extraction, preservation on board and landing;
e) Provide the Ministry of Production with the scientific bases for the rational administration of marine and continental resources;
f) Promote the development of scientific and technological research, as well as the training, improvement and specialization of scientific and technical researchers;
g) Assume, by delegation of the Government, its representation before international organizations regarding its purpose;
h) Participate with other Public Organizations in the formulation of scientific and technological policies;
i) Coordinate, with the academy, such as universities, institutes, among others, as well as with natural or legal persons, investigations of mutual interest;
j) Disseminate the results of their studies and research to the scientific community and the general public;
k) Sign agreements and/or contracts with individuals and/or legal entities, national and international, to promote national technical-scientific development in matters within its competence, subject to the pertinent legal provisions; and,
l) Others that are established by legal device."

Fishery management organisations are legally empowered to take management actions. M.1.4 is met.

M1.5 There is a consultation process through which fishery stakeholders are engaged in decision-making.
According to LGP Law Nº 25977: "Article. 3. The State encourages the widest participation of natural or legal Peruvian persons in the fishing activity and also promotes foreign investment subject to the relevant provisions of Peruvian legislation."

The Supreme Decree No. 012-2001-PE dictates a consultation process for modifying the regime of access to the extractive activity (CDN[2], 2023):
"11.2 To proceed with modifying the regime of access to the extractive activity, the Ministry of Fishing shall previously have the following information:

a) The will expressed in writing by the companies representing at least the 80% of the total volume of the capacity of the winery of the resources under the access regime if you intend to modify, together with 80% of the total installed capacity of them fishing industrial establishments that hold a license dedicated to processing them same resources;

b) The corresponding information from IMARPE; y,
c) The recommendations of a panel of internationally recognized scientists in terms of research, specifically convened to assess the situation of the resource and its fishing.

11.2 The regime of access to the aquaculture activity is constituted by the authorizations and concessions granted in accordance with the regulations on the matter.

11.3 The regime of access to the fishing processing activity is constituted by the installation authorizations and operating licenses granted in accordance with the provisions of the Chapter IV of Title III of this Regulation."

National Fisheries Society – SNP ("*Sociedad Nacional de Pesquera",* in Spanish) is a non-profit organization created by the fishing industry, which main aim is to lead the growth of fishing and aquaculture industries in Peru by combating illegal activities and supporting the protection of the environment through sustainable fishing, sound science, and creative techniques. SNP's goals include representing the industry in government forums and meetings and facilitating cooperation with government and regional departments that promote and grow Peru's fishing and aquaculture industries. Article 7º of the SNP's Ethical Code is devoted to complaints about the decision-making process. The government and SNP have made agreements to comply with transparent decision-making processes and deliver speedy resolutions to fisheries issues. Consequently, 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 organisations interested in the development of standards and policies pertaining to fisheries management.

According to the three-year audit conducted by MRAG for FisheryProgress of the Fishery Improvement Project Progress - FIP of Peru anchovy - industrial purse-seine fishery in northern region (FishChoice, 2019) the performance indicator "Decision making processes" of the component "Fishery specific management system" has been met and there were several advances on the participatory process in Peru fisheries last years:
"a) PRODUCE publish their proposed regulations and consult on them before they become official regulations. This was described by stakeholders at the FIP review meeting. Some evidence of this would be useful for full-assessment.

The Oannes network is a communication network for the fishing industry. There are 30,000 users in this network and email list. Oannes runs social networks for the fishing industry to generate dialogue. They also represent the fishing industry in meetings with government and in FIP meetings, they can use the information from their networks to express what the sector desires. The networks contain fishermen from all sectors as well as scientists.

Since September 2019, there has been a technical consultation meeting every two weeks, which involves SNP, relevant government departments and the national industry society. Anyone in the group can put something on the agenda for discussion. This is the main conflict resolution system, and examples were provided of the system solving disputes.

There is a "Forum for sustainable fisheries and aquaculture" (http://www.fpas.pe/), whose objective is to promote dialogue and research among the different actors in fisheries and aquaculture in Peru. Forum members include regulators, NGOs, companies and academics. The forum organizes multiple meetings per year both in Lima and regionally to discuss relevant topics such a management issues. There is also an electronic suggestions platform. This forum has increased the ability for all parties to be involved.

b) The management system includes consultation processes and there are many ways the government engages with forums and representative groups to gather opinions and solve issues. SG 80 is likely to be met.

c) The private industry network run by Oannes, and the and the public-private forum involves fishers from all sector and provide opportunity for all affected parties to be involved. The management system itself has informal and formal mechanisms by which all interested parties can be involved. Government meet with stakeholders and receive their proposals as standard practice. SG80 is likely to be met."

Scot (2020) reinforces compliance with consultation process in the report of analyses of relevant information directed by the Marine Stewardship Council - MSC certification requirements:
"(SI-a | SG 80) The Forum for Sustainable Fishing and Aquaculture has been strengthened. Stakeholders participating from the forum include governmental entities, non-governmental entities, academia and fishing companies. (SI b | SG 80) There is now evidence that consultation procedures take place regularly and that feedback is accepted and considered by fishing managers, as shown by the adoption of regulations for the DHC fishery following consultations in 2016 and 2017. (SI c | SG

80) PRODUCE has implemented an online platform for any interested parties to provide suggestions for improvements, facilitating public participation and engagement".

There is a consultation process through which fishery stakeholders are engaged in decision-making. M.1.5 is met.

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

In IMARPE website, it is possible to obtain several information of fishery, such as daily data of landings, biweekly reports with information of landings and sizes of the species caught, investigation reports that were used as support for the creation of Ministerial Resolutions, graphs of landings, fishing effort, sizes, distribution of catches, Catch Per Unit Effort (CPUE) per fishing season and others: https://www.imarpe.gob.pe/imarpe/index2.php?id_seccion=reportes.

In Peru government website, several communications and reports can be accessed, such as communications of temporal and special fisheries closures, reports of the situation of specific fish stocks and exploitation perspectives for fishing seasons, results of hydroacoustic evaluation cruises performed by IMARPE, updated of fishing LMTCPs through the year, etc: https://www.imarpe.gob.pe/imarpe/index2.php?id_seccion=reportes. The reports provide the support data for the management decisions for the fisheries.

From stock assessment results, LMTCPs are set for the next fishing season based on formulas explicitly set out in decision tables by IMARPE. The protocol for establishing the LMTCP is transparent, as is a summary of the most recent season of fishery data, such as landings and CPUE.

Legislation has been enacted in a timely manner to respond to general decisions, such as when a facility must be closed due to the presence of juveniles. The temporal and special closure of fisheries is announced online and is based on information provided by captains of fishing vessels through electronic logbooks to DGSFS, which gives access of this data to IMARPE for given advice. For anchovy this process is regulated through Supreme Decree N° 024-2016-PRODUCE (El Peruviano, 2016) and it was applied recently considering the amount of juveniles caught this year (CDN[3], 2023).

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

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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 PRODUCE, through DGSFS. Fisheries' activities and landings are controlled under a specific program approved by Ministerial Resolution N° 027-2003-PRODUCE.

Monitoring is conducted at sea via compliance observers. There is also monitoring of landings at port from PRODUCE. Third-party operators conduct landing operations verification at designated landing sites.

The Fishing and Landings Surveillance Program (PVCPDAM), Vessel Departure Control checks and the Satellite Surveillance System of fishing vessels (SISESAT) are used to monitor industrial fishing operations (Arias Schreiber 2012).

There is an organisation responsible for monitoring compliance with fishery laws and regulations. M.2.1 is met.

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

As mandated by the Regulations of the Organization and Functions of PRODUCE, a list of penalties and applicable legislation, fines, and fishing bans are published in PRODUCE website.

Other regulations pertinent to the application of sanctions in the fishing industry include:

- General Fisheries Law N° 25977 (Articles 76 to 83)
- Supreme Decree N° 012-2001-PE Regulation of the General Fisheries Law (Articles 126 to 150)
- Supreme Decree N° 016-2007-PRODUCE: Regulation of fishing and aquaculture inspections and sanctions: Inspectors' inspection powers, including the ability to issue fines for noncompliance
- Supreme Decree N° 024-2016-PRODUCE: Control and inspection measures (fines, licence revocations)

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

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

One of the objectives of the current management efforts is to organise data gathered by industrial fishing vessels and stimulate additional technology innovation and development to enable more effective ecosystem evaluation and monitoring.

The government made Vessel Monitoring System-VMS data from fleets available to the Global Fishing Watch (GFW) application beginning in October 2018. At the time, Peru was the first country in Latin America to give these data to the GFW platform, which aims to increase openness in fishing operations and eliminate Illegal, Unreported and Unregulated - IUU fishing globally, including vessels from industrial fleets.

The fishery is closed to new vessels, and all designated landing points are monitored around-the-clock to ensure that only vessels with permits are permitted to land catch. PRODUCE implemented a fishing closure to prevent unlawful activity and to limit the annual catch (Senate Bill N° 544-2019- PRODUCE).

The Protocol (N° 54-2019-MP-FN) published by PRODUCE intends to establish a mechanism that must be adopted to undertake surveillance operations against illegal fishing of marine fish species. Document N° 0005-2016-PCC / TC – Case of Judicial Resolutions in Fisheries was issued by the Constitutional Court ("*Tribunal Constitucional",* in Spanish). With this judgement, the Constitutional Court concluded the request for conflict-of-jurisdiction fishery licences provided by judicial decisions.

PRODUCE has published Ministerial Resolution N° 306-2020, in which it specifies the criteria for determining the LMTCP for the Direct Human Consumption (DHC) sub-fishery. After a new Executive Table was convened in October 2021, the DS N° 024-2021-PRODUCE was authorised, implementing fisheries traceability system for the fishing industry, and with plans to gradually make it binding for the small-scale sector. Resolution stipulates that the combined LMTCP for the DHC and Indirect Human Consumption - IHC sub-fisheries should not exceed the IMARPE-recommended catch rate for the anchovy stock. The DGSFS of PRODUCE has issued Directive N°061-2020-PRODUCE/DGSFS-PA, which establishes the rules by which PRODUCE will continue to supply IMARPE with information regarding unlawful and undeclared fishing in the Peruvian anchovy fishery. This information is also used to determine IMARPE's LMTCP recommendations.

Off the coast of Peru, under-reporting of landed catches and discards of juvenile anchovies have been reported. In contrast to the north-central anchovy stock, however, there are paucity of data on the severity of this issue for southern stocks. Some stocks of Peruvian anchovy have reported discards in industrial fisheries recent years due to the presence of excessive numbers of juveniles (Grillo et al., 2019; Diaz 2017; Wosnitza-Mendo et al, 2010). However, in the absence of exact statistics on extent of discards and extent of fisheries efforts for the southern anchovy stock, concrete conclusions cannot be derived based on publicly available information alone (Estrada 2020; Grillo et al., 2019; Aguilar-Ramírez et al, 2018).

Since 2016, fishing vessels have been required to disclose their fishing locations and the percentage of juveniles in their catches. IMARPE evaluates such data to identify critical fishing zones with a high frequency of juvenile catches, in order to recommend temporary closures of these zones to PRODUCE. This form of protection for the juvenile population is especially critical during warming events, when the increasing overlap in the spatial distribution of adults and juveniles makes the latter more susceptible to capture. In addition, an electronic landing monitoring programme has been implemented, and a self-sampling procedure for fishing vessels has been promoted, both for fishing effort monitoring and biological, population, and ecological monitoring (e.g., size structure of anchovy, bycatch) – including the monitoring of anchovy size structure and bycatch (PRODUCE 2016; Oliveros-Ramos et al, 2021).

There is no substantial evidence of widespread non-compliance in the fishery, and no substantial evidence of IUU fishing. M.2.3 is met.

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.

Current fisheries regulation mandates that industrial vessels operate a Satellite Tracking System (SISESAT) designed to keep them at least 5 nautical miles distance from the coast. In 2016, DGSFS built a mobile application and integrated it with the SISESAT system. According to PRODUCE, the software enables qualified inspectors to examine the location, speed, heading, and distance of fishing vessels to the coast with greater precision than traditional satellite systems. As per PRODUCE Supreme Decrees N° 10-2010, N° 5-2012, and N° 01-2013, mandatory Vessel Monitoring Systems (VMS) are in force. In addition, the

electronic/radio log is necessary for the fisheries (PRODUCE, 2016). All designated landing spots are monitored around-the-clock to ensure that only vessels with permits are permitted to land catch.

Landings and size composition of the industrial fleet are monitored continuously (24/7) at every landing site. Currently, IMARPE and PRODUCE onboard observers collect information from up to 80% of fishing trips, with VMS mandatory for the industrial fleet. Stock assessment is carried out by IMARPE, estimating the population structure from the results of the hydroacoustic surveys and projected under several harvest scenarios. Harvest scenarios are projected up to the next reproductive peak, and use different population parameters (e.g., growth, mortality) according to the environmental conditions (favourable or unfavourable) predicted during the period. The results are presented in the form of a decision table (IMARPE, 2015; IMARPE, 2023) used by PRODUCE to set the LMTCP for the current fishing season (Oliveros-Ramos et al., 2021).

The fishing season starts 15 days after authorization by PRODUCE. Between the authorization date and the beginning of the fishing season, an exploratory fishing trip is supervised by IMARPE. The objective is to update knowledge on the spatial distribution of the resource and particularly to identify areas with a high proportion of juveniles, in order to set temporal closures. The catch during the exploratory fishing is taken into account for the final setting of the LMTCP (Oliveros-Ramos et al., 2021).

During the anchovy assessment procedure, the estimated quantity and weight of juvenile animals landed during a fishing season (as a fraction of the LMTCP) are computed and reported to PRODUCE. This figure, referred to as the "juvenile LMTCP," provides an additional management criterion that strengthens the protection of juvenile individuals: it permits PRODUCE to close the fishery once landings reach the juvenile LMTCP, even if the full LMTCP has not been reached, thereby protecting the more diverse population during warming events (Oliveros-Ramos et al., 2021).

Compliance with laws and regulations is actively monitored, through a regime which may include at-sea and portside inspections, observer programmes, and VMS. M.2.4 is met.

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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		**Anchovy (*Engraulis ringens*) [“*anchoveta*”, in Spanish]**	
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.

In Peru, landing data is monitored by independent third-party operators (SGS) in designated landing sites (Figure 4). IMARPE collects these data and use to assess the stock. It is possible to follow daily data of landings in IMARPE website. During the first fishing season of 2023 (From 05th January to 30th June), 25,372 tons of anchovy were landed in southern Peru (IMARPE[1], 2023), while in 2022, total landings were 264,000 tons (IMARPE[2], 2023).

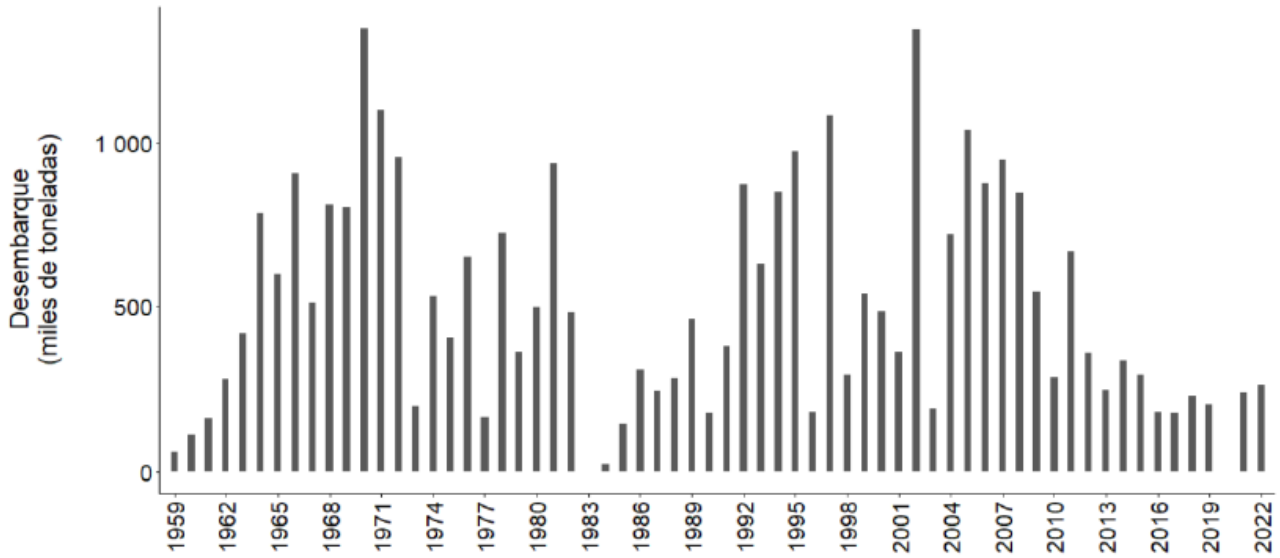

Figura 2. Desembarques anuales de anchoveta (millones t) registrados en la región sur del litoral peruano, desde 1959 a 2022.

Figure 4. Annual landings of anchovy (millions t) registered in the southern region of the Peruvian coast, from 1959 to 2022 (IMARPE[1], 2023).

Landings data are collected such that the fishery-wide removals of this species are known. A.1.1 is met.

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

IMARPE is the scientific institute in charge in carrying out most of the research that PRODUCE uses to develop fishery management policies in Peru. Since 1982, the IMARPE has monitored anchovy populations using acoustic techniques through twice-yearly hydroacoustic cruises along the geographical range of the anchovy population. In these surveys, performed before each fishing season, IMARPE monitors oceanographic conditions and carries out direct biomass estimates and onboard sampling to estimate size structure and reproductive parameters (IMARPE, 2020). The IMARPE’s PBP deploys observers aboard fishing

vessels in order to collect biological samples, while a private company collects them at ports. All data are analysed and used to calculate the catch quotas for the two anchovy fishing seasons per year for both the northern-central and southern stock (Arias Scheiber & Halliday 2013; Arias Schreiber 2013). When conditions are anomalous, real-time monitoring is intensified.

Sufficient additional information is collected to enable an indication of stock status to be estimated. A.1.2 is met.

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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.

The situation of the anchovy available in the southern region is analysed from three sources of information, such as the Pelagic Resources Hydroacoustic Evaluation Cruises carried out during the year, the CPUE of the industrial purse seine fleet and a model of population dynamics (IMARPE[1], 2023). The stock assessment is conducted annually by IMARPE and it covers the Peruvian part of the stock (which is shared with Chile), considering the whole fishing year. A mid-year evaluation is performed to evaluate the status of the stock before the second fishing season.

A stock assessment is conducted annually and it considers all fishery removals and the biological characteristics of the species. A.2.1 is met.

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

The platform Stochastic Surplus Production Model in Continuous Time - SPICT was used to evaluate the status of the southern anchovy stock by IMARPE in 2022. Input data included an acoustic biomass time series between 1985 and 2021, CPUE of industrial purse seine fleet from 2017-2022 and catches between 1959 and 2021 (IMARPE, 2023). Different parameters are estimated, including the maximum sustainable level - MSY, the biomass and the fishing mortality that will lead to the MSY (B_{MSY} and F_{MSY}, respectively) and the LMTCP. In 2023, it was established MSY = 849,000 tons, B_{MSY} = 888,000 tons, F_{MSY} = 956,000 mi tons/year and LMTCP = 486,500 tons (IMARPE[1], 2023).

The assessment provides an estimate of the status of the biological stock relative to a reference point or proxy. A.2.2 is met.

A2.3 The assessment provides an indication of the volume of fishery removals which is appropriate for the current stock status.

Based on the results of the stock assessment model indicated above, a decision table is built by IMARPE for establishing the LMTCP (Figure 5), which include different scenarios of fishing mortality rates – F, exploitation rate - E (which takes into account fishing mortality and natural mortality) and the risk of the biomass falling below the MSY level (IMARPE[1], 20023). PRODUCE set a precautionary catch limit recommended (80% of MSY) as catch quota level for 2023 (R.M. N° 464-2022-PRODUCE) and divided into two equal parts for each of the corresponding fishing seasons (January - June and July - December). The LMTCP can be modified through the year according to fishing and environmental biological factors (CDN, 2022). For the first season of 2023, a LMTCP of 337,00 was established, but landings reached only 25,372 tons (7.53% of LMTCP), probably due effects of the 2023 costal El Niño [IMARPE[2], 2023].

Tabla 3. Tabla de Decisión para el establecimiento del *LMTCP* de anchoveta en la región sur del mar peruano para el año 2023.

F_{2023}	E_{2023}	Captura 2023 (millones t)	Biomasa remanente 01/01/24 (millones t)	Riesgo ($B_{2024} < B_{2023}$) (%)	Riesgo ($B_{2024} < B_{MRS}$) (%)
0.00	0.00	0.000	1.415	26	20
0.03	0.02	0.039	1.384	28	21
0.07	0.04	0.078	1.354	30	23
0.10	0.06	0.115	1.325	32	24
0.13	0.08	0.152	1.296	33	26
0.16	0.10	0.187	1.269	35	28
0.20	0.11	0.222	1.241	37	30
0.23	0.13	0.256	1.215	39	32
0.26	0.15	0.289	1.189	41	33
0.29	0.16	0.321	1.163	42	35
0.33	0.18	0.353	1.138	44	37
0.36	0.20	0.384	1.114	45	38
0.39	0.21	0.413	1.090	47	40
0.42	0.23	0.443	1.067	48	41
0.46	0.24	0.471	1.044	49	43
0.49	0.25	0.499	1.022	50	44
0.52	0.27	0.526	1.000	51	45
0.55	0.28	0.552	0.979	52	46
0.59	0.29	0.578	0.958	53	47
0.62	0.31	0.603	0.938	53	48
0.65	0.32	0.627	0.918	54	49
0.68	0.33	0.651	0.898	55	50
0.72	0.34(1)	0.674	0.879	55	50
0.75	0.35	0.697	0.861	56	51
0.78	0.36	0.719	0.842	56	52
0.81	0.38	0.740	0.825	57	52
0.85	0.39(2)	0.761	0.807	57	53
0.88	0.40	0.782	0.790	58	53
0.91	0.41	0.802	0.774	58	54
0.94	0.42	0.821	0.757	58	54
0.98	0.43(3)	0.840	0.742	59	55
1.01	0.43	0.859	0.726	59	55

(1) Nivel de explotación correspondiente al 80% del MRS.
(2) Nivel de explotación correspondiente al 90% del MRS.
(3) Nivel de explotación correspondiente al MRS.

Figure 5. Decision Table for the establishment of the LMTCP of anchovy in the southern region of the Peruvian sea for the year 2023. (1) The Exploitation level corresponding to 80% of MSY. (2) The Exploitation level corresponding to 90% of MSY. (3) The Exploitation level corresponding to MSY. Source: IMARPE[1](2023).

The assessment provides an indication of the volume of fishery removals which is appropriate for the current stock status. A.2.3 is met.

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

According to the most recent assessment report, the department of Pelagic Fishery Directorate of IMARPE ("*Seguimiento de la Pesquería Pelágica*", in Spanish) and the Direction of Supervision and Inspection of PRODUCE ("*Dirección de Supervisión y Fiscalización",* in Spanish) contributed with biological fishing information to the assessment (IMARPE[1], 2023). IMARPE performs the stock assessment, which are reviewed by the PRODUCE before setting the LMTCP for the stock. The methodology for the evaluation of the status of the southern stock was reviewed in 2015 by IMARPE. Therefore, some institutions seem to collaborate in the preparation of those reports.

According to MBA (2023): "IMARPE methods to assess the anchovy stock were peer reviewed by an international panel of experts in 2009 and again by FAO experts in 2014 {FAO 2014}. FAO experts provided a series of recommendations to IMARPE such as using integrative, indirect methods for stock assessment, long-term projections, harvest control rules for different environmental conditions, and including catches and biomass of all fleets, etc. However, it was concluded that there is a high standard scientific support towards the management of fisheries in Peru {FAO 2014}."

Peru and Chile are also carrying out the project "Catalysing Implementation of a Strategic Action Programme for the Sustainable Management of Shared Living Marine Resources in the Humboldt Current System (HCS)" which includes among its objectives to establish mechanisms for data-sharing and collaborative stock assessment of the shared anchovy stock (between IMARPE and IFOP) [GEF, 2023], which could be considered an external review of the assessment process specifically for the southern Peruvian stock.

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

A2.5 The assessment is made publicly available.
Reports of stock assessments and advice on LMTCP for the anchovy stocks can be found on Peru government website under the PRODUCE-IMARPE option: https://www.gob.pe/institucion/imarpe/informes-publicaciones?sheet=40.

In IMARPE website, it is possible to obtain several information of fishery, which are used as support for the management decisions, such as daily data of landings, biweekly reports with information of landings and sizes of the species caught, investigation reports that were used as support for the creation of Ministerial Resolutions, graphs of landings, fishing effort, sizes, distribution of catches, CPUE per fishing season and others: https://www.imarpe.gob.pe/imarpe/index2.php?id_seccion=reportes.

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

References

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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.

In order to monitor the resources and compliance of fishing fleets, four programs are in place: the logbooks program (PBP) with onboard observers since 1996, to cover the fleet behaviour, species and size composition of catches, discards, and interactions with other species and the habitat; gathering information at the landing ports; the satellite vessel tracking system (SISESAT); and scientific surveys.

As indicated previously, the catch of anchovy in the area is regulated through an annual LMTCP set by PRODUCE based on the recommendations given by IMARPE. Catches are monitored on a daily basis during the fishing season and it is closed when the LMTCP is reached (if it is not, a date limit is previously set). Temporal bans are also set to protect the stock when the number of juveniles in the catch surpasses a 10% limit, and it was applied recently considering the amount of juveniles caught this year (CDN, 2023).

There is a mechanism in place by which total fishing mortality of this species is restricted. A.3.1 is met.

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.

Anchovy catches are closely monitored by the authorities. The LMTCP has not been surpassed in recent years. Since 2009 catches and fishing mortality have been below MSY and $F_{MSY,}$ (Figure 6) [IMARPE[1], 2023]. The available anchovy biomass in the southern region of the sea Peruvian is highly variable and, in general terms, fluctuates around its level of reference, being above the B_{MSY} since 2017.

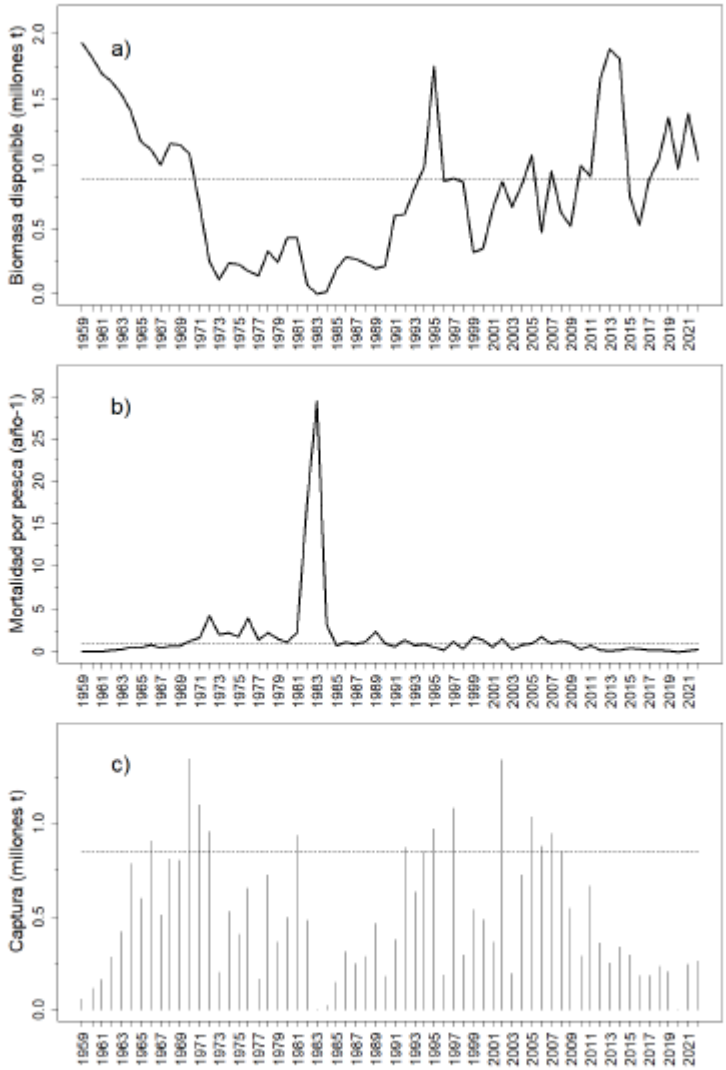

Figura 11. Resultados del Modelo de Producción Excedente: a) biomasa disponible en la región sur del mar peruano desde 1959 a 2022 y relación con su nivel de referencia (B_{MRS}); b) tasa de mortalidad por pesca aplicada sobre la biomasa y su relación con el nivel de referencia (F_{MRS}); y c) desembarques anuales y su relación con el MRS.

Figure 6. Results of the Surplus Production Model: a) biomass available in the southern region of the Peruvian sea from 1959 to 2022 and relationship with its reference level (B_{MSY}); b) fishing mortality rate applied to biomass and its relationship with the reference level (F_{MSY}); and c) annual landings and their relationship with the MSY. Source: IMARPE[1](2023).

During the first 2023 fishing season, only 7.53% of LMTCP was taken (Figure 7) [IMARPE[2], 2023].

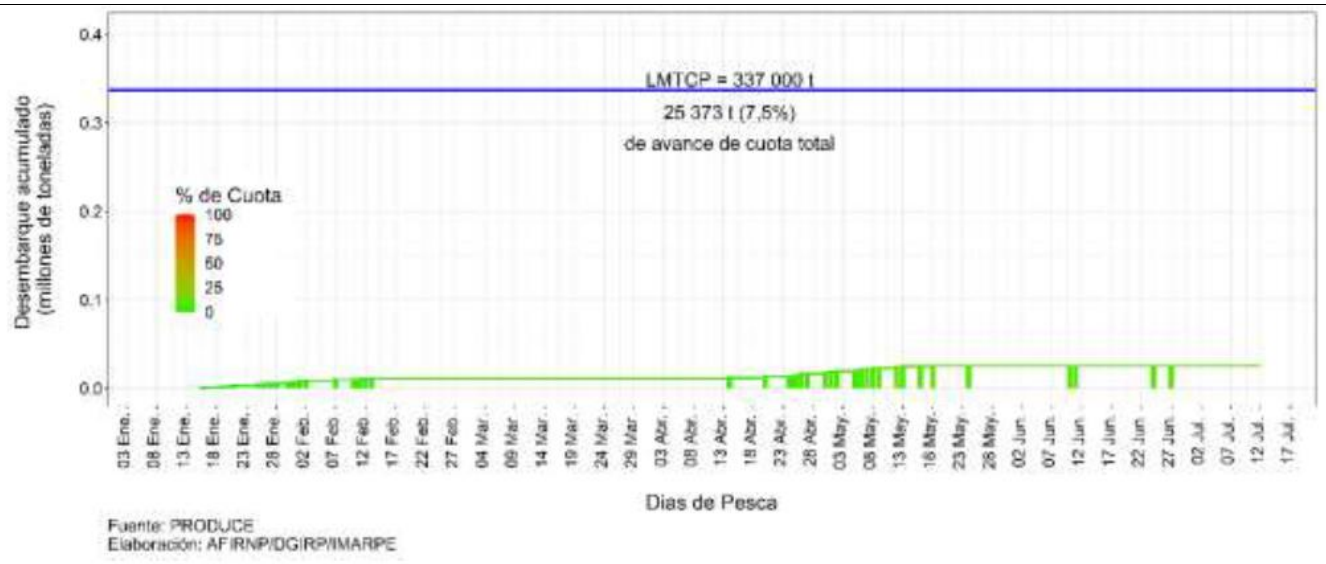

Figura 1. Desembarques acumulados de anchoveta y porcentaje de avance de cuota en la región sur del litoral peruano durante la primera temporada de pesca de 2023. Periodo: 05 de enero - 30 de junio. Fuente: PRODUCE, elaborado por: IMARPE.

Figure 7. Accumulated landings of anchovy and percentage of quota progress in the southern region of the Peruvian coast during the first fishing season of 2023 (January 05th - June 30th). June. Source: IMARPE[2](2023).

Total fishery removals of this species do not regularly exceed the level indicated or stated in the stock assessment. A.3.2 is met.

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).

A harvest control rule that anticipates reducing the fishing effort when biomass is low is not in place for the fishery. However, the fishing season is not started by the PRODUCE when the stock is below the limit biomass. When the fishery reaches the LMTCP established by the season, the fishery is closed. The LMTCP has been decided based on catches corresponded to 80% of MSY. Temporal bans are also set to protect the stock when the number of juveniles in the catch surpasses a 10% limit. The stock is currently considered to be above the biomass reference point (B_{MSY}).

When below the limit reference point, a recovery plan must be implemented. Therefore, it is considered that A3.3 is met.

References

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IMARPE. 2023[1]. Situación de la anchovy disponible en la región sur del mar Peruviano y perspectivas de explotación para la primera temporada de pesca de 2023. https://cdn.www.gob.pe/uploads/document/file/4025353/Inf%20Anch%20Sur%20y%20perspectivas%20I%20Temp%202023.pdf?v=1673015849

IMARPE. 2023[2]. Informe de la primera temporada de pesca de la anchovy (*Engraulis ringens*) en la región sur del mar Peruviano (enero a junio 2023) y perspectivas de explotación para la segunda temporada de pesca (julio a diciembre 2023). https://cdn.www.gob.pe/uploads/document/file/4930190/INFORME%20I%20TEMPORADA%20PESCA%20REG%20SUR%20%20ANCHOVY%20Y%20PERSPECTIVAS.pdf?v=1690991303

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: 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.	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.

According to the results of the Surplus Production Model, the anchovy biomass available in the southern region of the Peruvian sea is highly variable, but it generally fluctuates around its reference level (B_{MSY}) [IMARPE[1], 2023]. The stock is currently considered to be above the biomass reference point. Since 2009 catches and fishing mortality have been below MSY and F_{MSY}, which are estimated in 849,000 tons and 956,000 tons/year , respectively (Figure 8) [IMARPE[1], 2023]. The available anchovy biomass in the southern region of the sea Peruvian is highly variable and, in general terms, fluctuates around its level of reference, being since 2017 above the B_{MSY}, which is estimated in 888,000 tons. During the first 2023 fishing season, only 7.53% of LMTCP was taken (Figure 9) [IMARPE[2], 2023].

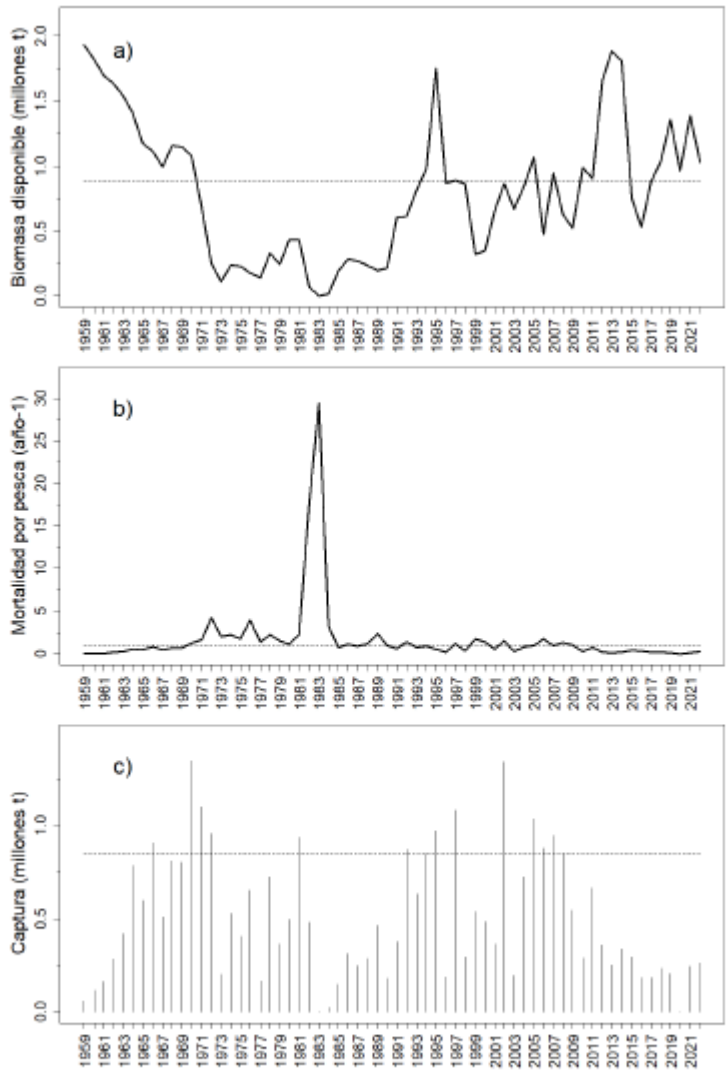

Figura 11. Resultados del Modelo de Producción Excedente: a) biomasa disponible en la región sur del mar peruano desde 1959 a 2022 y relación con su nivel de referencia (B_{MRS}); b) tasa de mortalidad por pesca aplicada sobre la biomasa y su relación con el nivel de referencia (F_{MRS}); y c) desembarques anuales y su relación con el MRS.

Figure 8. Results of the Surplus Production Model: a) biomass available in the southern region of the Peruvian sea from 1959 to 2022 and relationship with its reference level (B_{MSY}); b) fishing mortality rate applied to biomass and its relationship with the reference level (F_{MSY}); and c) annual landings and their relationship with the MSY. Source: IMARPE[1](2023).

Figura 1. Desembarques acumulados de anchoveta y porcentaje de avance de cuota en la región sur del litoral peruano durante la primera temporada de pesca de 2023. Periodo: 05 de enero - 30 de junio. Fuente: PRODUCE, elaborado por: IMARPE.

Figure 9.Accumulated landings of anchovy and percentage of quota progress in the southern region of the Peruvian coast during the first fishing season of 2023 (January 05th - June 30th). June. Source: IMARPE[2](2023).

The stock is at or above the target reference point. A.4.1 is met.

References

IMARPE[1]. 2023. Situación de la anchovy disponible en la región sur del mar Peruviano y perspectivas de explotación para la primera temporada de pesca de 2023. https://cdn.www.gob.pe/uploads/document/file/4025353/Inf%20Anch%20Sur%20y%20perspectivas%20I%20Temp%202023.pdf?v=1673015849

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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		**Eastern Pacific bonito (*Sarda chiliensis chiliensis)* [“*bonito*”, in Spanish]**	
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.

Annual landings of Eastern Pacific bonito are recorded (Figure 10). There is a stablished mortality reference level and an annual catch limit divided by trimester. The catch associated with the F_{MSY} was estimated at 209,000 t and the landings of Eastern Pacific bonito in 2022 were 82,437 t, although the annual catch limit in 2022 was of 40,516. Historically, the highest levels of fishing mortality were applied in the 1970s and 1980s. Since the mid-2000s there has been an increasing trend in the annual levels of fishing mortality, coinciding with the increase in fishing effort and landings. Nevertheless, the mortality rate by annual fishing has been below the reference level for years (IMARPE, 2023).

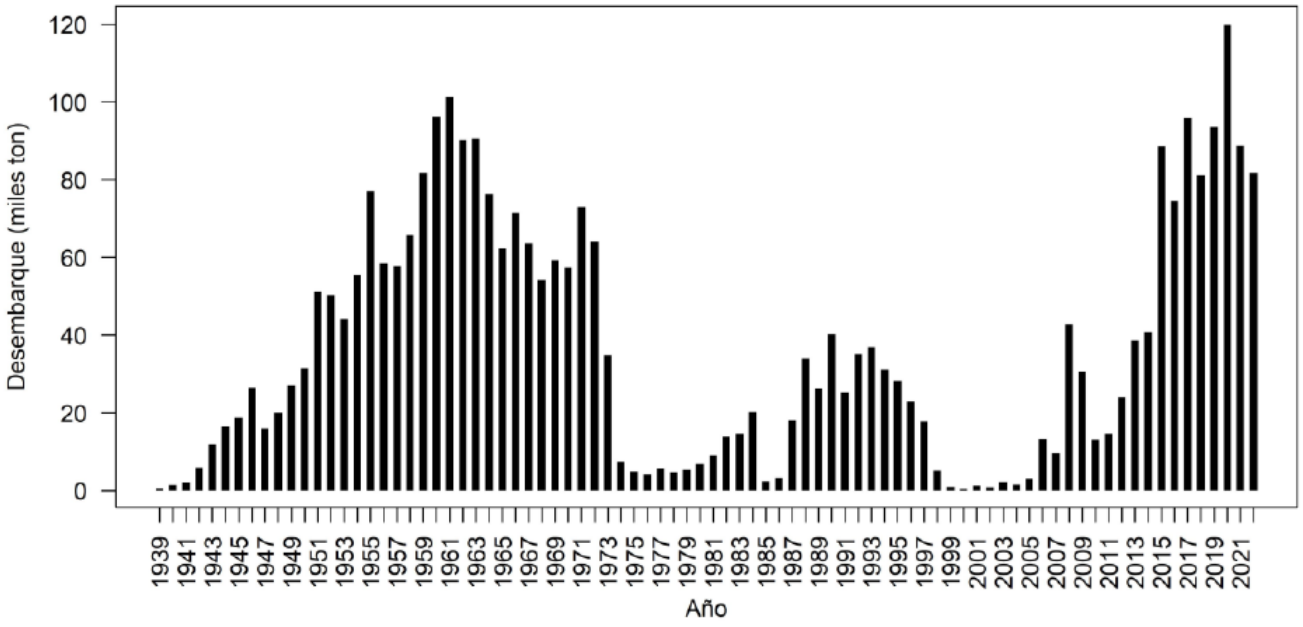

Figura 3. Desembarque anual de bonito en Perú, desde 1939 al 2022*.

Figure 10. Annual lands of Eastern Pacific bonito from 1939 to 2022 (IMARPE, 2023).

Fishery removals of the species in the fishery under assessment are included in the stock assessment process. C.1.1 is met.

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

IMARPE (2023) shows that total biomass and spawning biomass of Eastern Pacific bonito has been variable over time. From 2000 to 2019, both total and spawning biomass show an increasing trend, reaching their highest level in 2019. Since 2020, biomass levels have started to decline, but they are still well above the reference level (Figure 11).

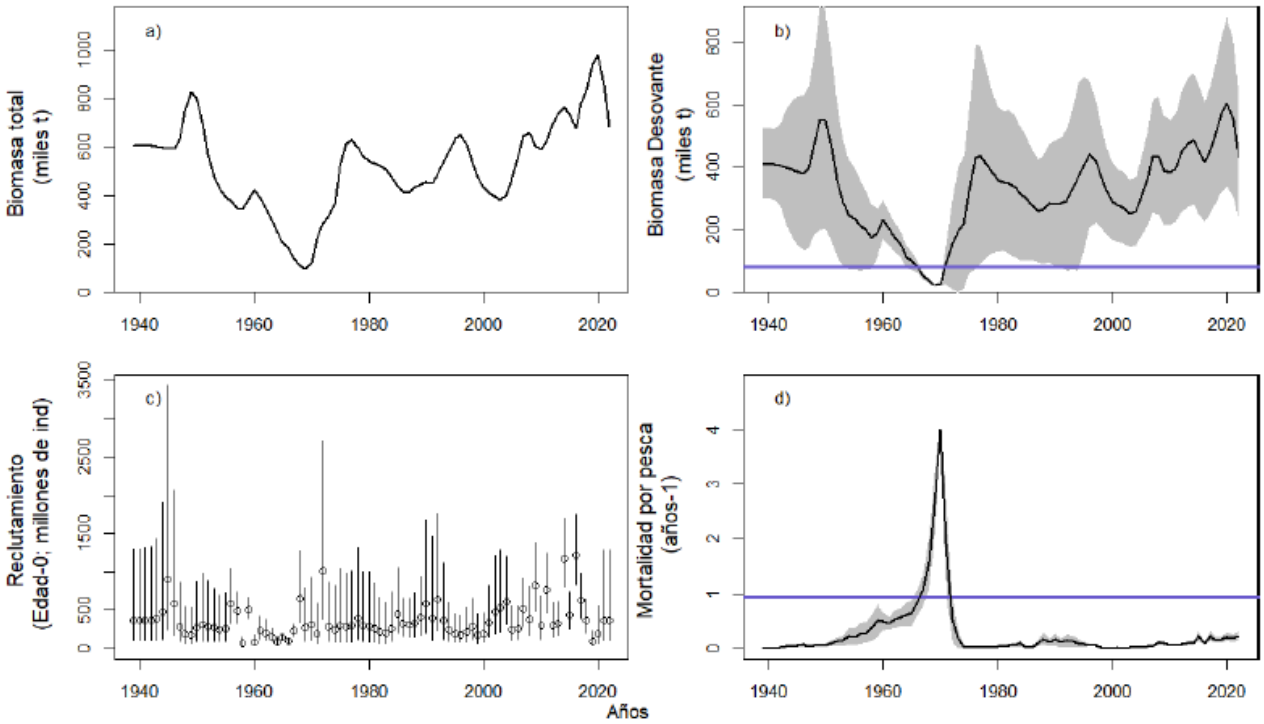

Figura 17. Indicadores poblacionales estimados para el stock peruano de bonito: a) Biomasa Total anual (miles t); b) Biomasa Desovante anual (BD; miles t); c) Reclutamiento anual (millones de individuos), y d) Tasa de Mortalidad por Pesca anual (F). Las líneas horizontales en color morado expresan los niveles de referencia para BD y F respectivamente.

Figure 11. Estimated population indicators for the Peruvian Eastern Pacific bonito stock: a) Total annual biomass (thousand t); b) Annual Spawning Biomass (BD; thousands t); c) Annual recruitment (millions of individuals), and d) Annual Fishing Mortality Rate (F). The horizontal lines in purple/blue express the target reference levels (B_{MSY} and F_{MSY})[IMARPE, 2023].

The species is considered, in its most recent stock assessment, to have a biomass above the limit reference point (or proxy). C.1.2 is met.

References

IMARPE. 2023. Informe sobre aspectos biológicos y pesqueros de bonito (*Sarda chiliensis chiliensis*) durante el 2022 y perspectivas de explotación para el 2023. https://cdn.www.gob.pe/uploads/document/file/4236497/INFORME%20BIOLOGICO%20PESQUERO%20BONITO%202022%20Y%20PERSPECTIVAS%202023.pdf?v=1678398638

Links	
MarinTrust Standard clause	1.3.2.2
FAO CCRF	7.5.3
GSSI	D.3.04, D5.01

Species Name	Chilean jack mackerel (*Trachurus murphyi)* [“*jurel*”, in Spanish]	
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.

Annual landings of Chilean jack mackerel in Peru are recorded (Figure 12). There is a stablished mortality reference level and an annual catch limit. The annual catch limit in 2022 was 118,408 t, with additional 35,544 tons for incidental catches associated to the Chub mackerel fishery. The landings of Chilean jack mackerel in 2022 were 163,000 t. The Fishing Mortality (F) that has been applied in recent years is below the reference level (F_{MSY}). The catch associated with the F_{MSY} was estimated at 209,000 t (IMARPE, 2023).

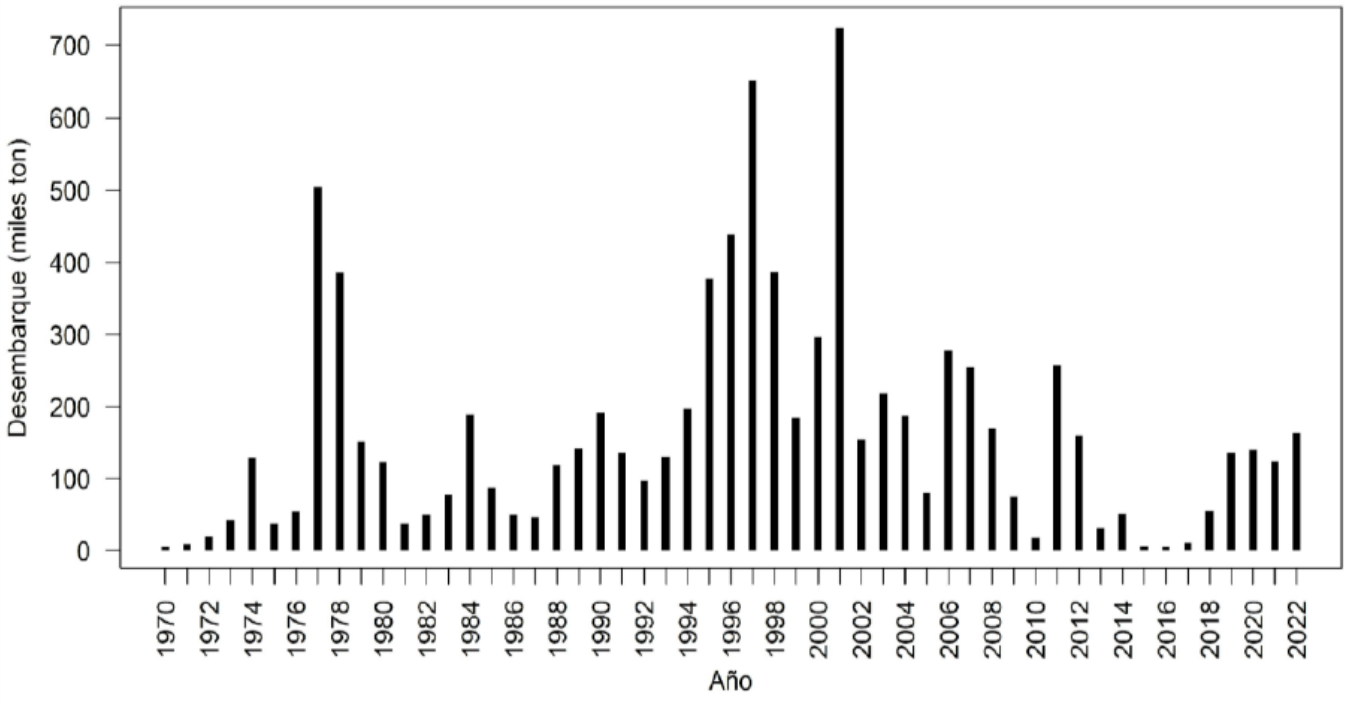

Figura 3. Desembarque anual de jurel en Perú, desde 1970 al 2022.

Figure 12. Annual landings of Chilean jack mackerel in Peru, from 1970 to 2022 (IMARPE, 2023).

Fishery removals of the species in the fishery under assessment are included in the stock assessment process. C.1.1 is met.

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

There has been a progressive increase in Total Biomass (BT) and Spawning Biomass (BD) from 2016 to 2020. Since then, the biomass remains relatively stable and above that necessary for maximum sustainable yield (BD_{MSY}) [Figure 13] [IMARPE, 2023].

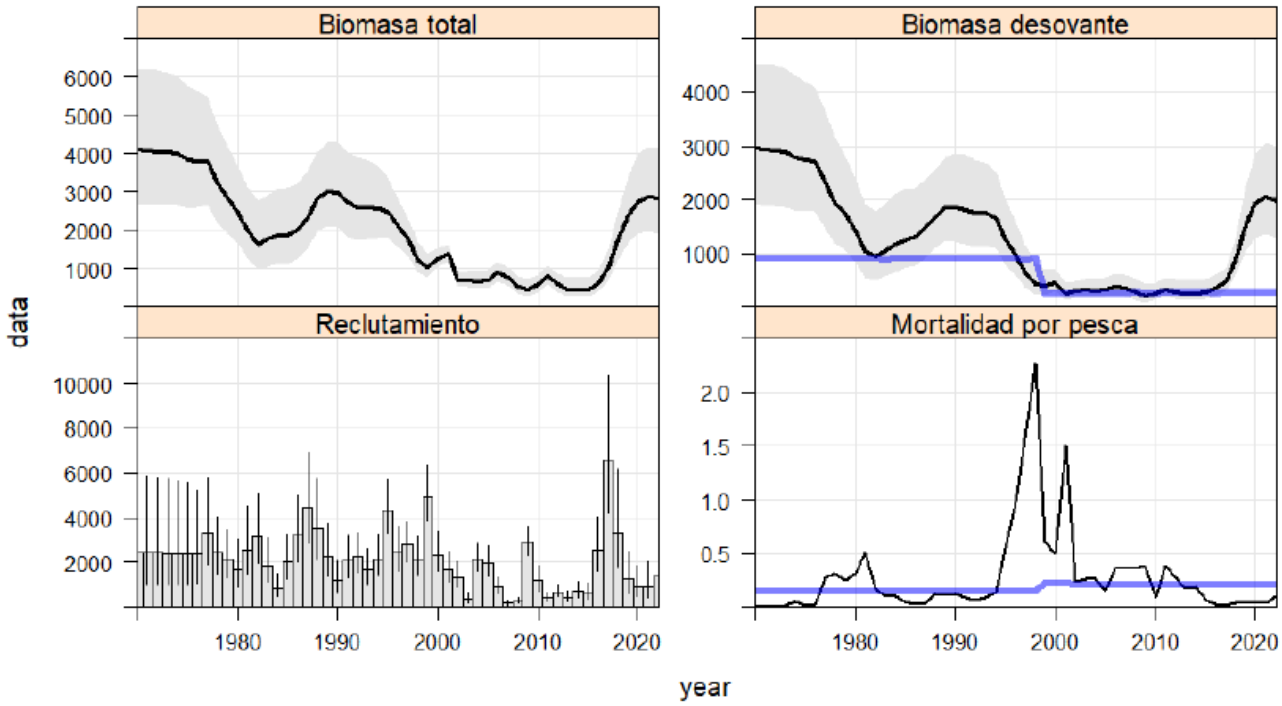

Figura 15. Indicadores poblacionales estimados para el stock peruano del jurel: a) Biomasa Total anual (miles t); b) Biomasa Desovante anual (miles t); c) Reclutamiento anual (millones individuos), y d) Tasa de Mortalidad por Pesca anual.

Figure 13. Estimated population indicators for the Chilean jack mackerel: a) Total annual biomass (thousand t); b) Annual spawning biomass (thousand t); c) Annual recruitment (millions of individuals), and d) Annual Fishing Mortality Rate. The horizontal lines in purple/blue express the target reference levels (B_{MSY} and F_{MSY}) [IMARPE, 2023].

The species is considered, in its most recent stock assessment, to have a biomass above the limit reference point (or proxy). C.1.2 is met.

References

IMARPE. 2023. Informe sobre el desarrollo de la pesquería de jurel *Trachurus murphyi* durante el 2022, situación actual y perspectivas de explotación para el 2023. https://www.gob.pe/institucion/imarpe/informes-publicaciones/3871023-informe-sobre-el-desarrollo-de-la-pesqueria-de-jurel-trachurus-murphyi

Links	
MarinTrust Standard clause	1.3.2.2
FAO CCRF	7.5.3
GSSI	D.3.04, D5.01

Species Name	**Chub mackerel (*Scomber japonicus)* [“*caballa*”, in Spanish]**	
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.

Annual landings of Chub mackerel are recorded (Figure 14). There is a stablished mortality reference level and an annual catch limit. The annual catch limit in 2022 was 74,000 t. The landings of Chumb Mackerel in 2022 were 68,000 t. The Fishing Mortality (F) that has been applied in recent years is below the reference level (F_{MSY}). The catch associated with the F_{MSY} was estimated at 218,000 t (IMARPE, 2023).

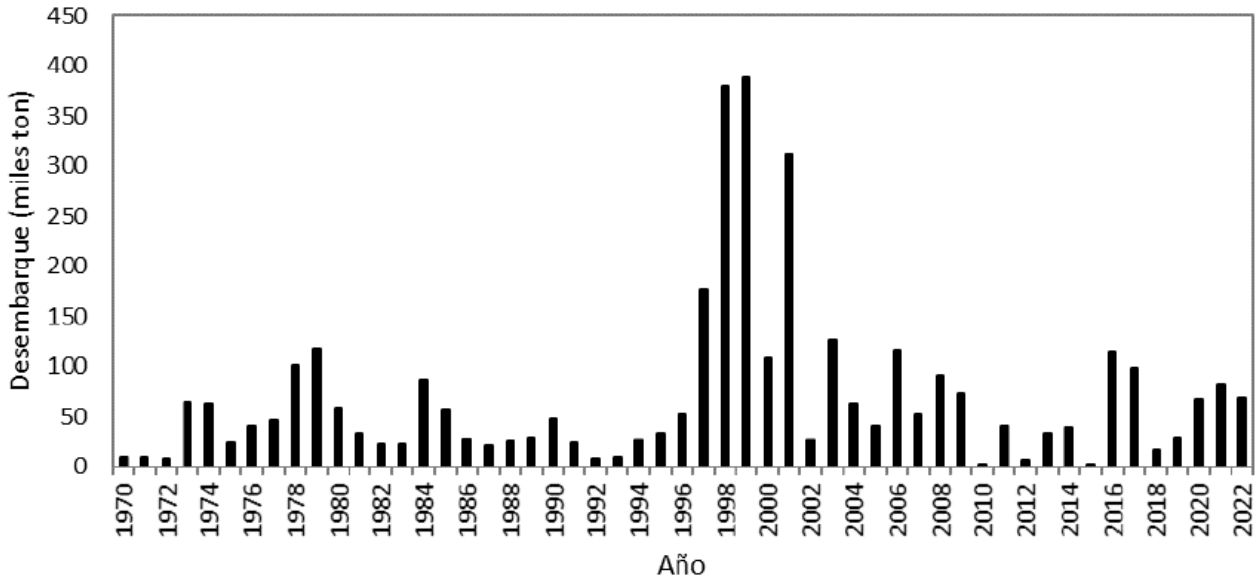

Figura 3. Desembarque anual de caballa en Perú, desde 1970 al 2022.

Figure 14. Annual landings of Chumb mackerel in Peru from 1970 to 2022 (IMARPE, 2023).

Fishery removals of the species in the fishery under assessment are included in the stock assessment process. C.1.1 is met.

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

The estimate biomass was 241,010 t in 2022. There has been a progressive increase in Total Biomass (BT) and Spawning Biomass (BD) from 2016 to 2020, with a slight decrease afterwards. The biomass remains above that necessary for maximum sustainable yield (BD_{MSY}) since 2016 (Figure 15) [IMARPE, 2023].

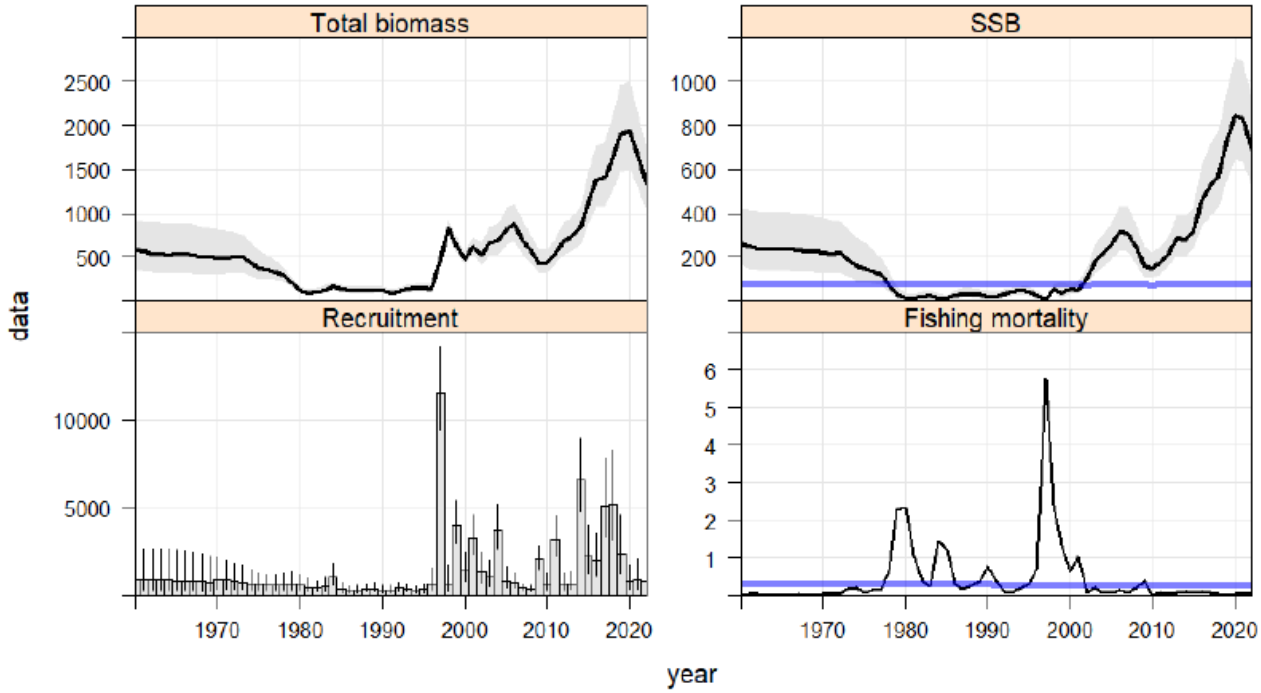

Figura 14. Indicadores poblacionales estimados para la caballa presente en aguas peruanas: a) Biomasa Total anual (miles t); b) Biomasa Desovante anual (miles t); c) Reclutamiento anual (millones individuos), y d) Tasa de Mortalidad por Pesca anual.

Figure 15. Estimated population indicators for chum mackerel present in Peruvian waters: a) Total annual biomass (thousand t); b) Annual spawning biomass (thousand t); c) Annual recruitment (millions of individuals), and d) Annual Fishing Mortality Rate. The horizontal lines in purple/blue express the target reference levels (BMSY and FMSY) [IMARPE, 2023].

The species is considered, in its most recent stock assessment, to have a biomass above the limit reference point (or proxy). C.1.2 is met.

References

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Links	
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FAO CCRF	7.5.3
GSSI	D.3.04, D5.01

CATEGORY D SPECIES

Category D species are those which 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**	**Carrot/red squat lobster (*Pleuroncodes monodon) ["munida", in Spanish]***

Productivity Attribute	**Value**	**Score**
Average age at maturity (years)	5-6 [1]	2
Average maximum age (years)	5[2]	1
Fecundity (eggs/spawning)	1,000-50,000[1]	2
Average maximum size (cm)	8[1]	1
Average size at maturity (cm)	2.7[2]	1
Reproductive strategy	Demersal spawner[1]	2
Mean trophic level	3.20[2]	2
	Average Productivity Score	**1.57**
Susceptibility Attribute	**Value**	**Score**
Availability (area overlap)	<10% of the stock	1
Encounterability (the position of the stock/species within the water column relative to the fishing gear)	Low (Benthic species)	1
Selectivity of gear type	Retained	3
Post-capture mortality	Retained	3
	Average Susceptibility Score	**2**
	PSA Risk Rating (From Table D3)	**Pass**
	Compliance rating	**Pass**

Further justification for susceptibility scoring (where relevant)

For susceptibility attributes, please provide a brief rationale for scoring of parameters where there may be uncertainty affecting your decision

Carrot/red squat lobster is found in Eastern Pacific: from Easter Island to Gulf of Tehuantepec, Mexico, south to Chiloe Island, Chile. It is a benthic species, with depth range of 50 - 900 m^2 (Figure 16).

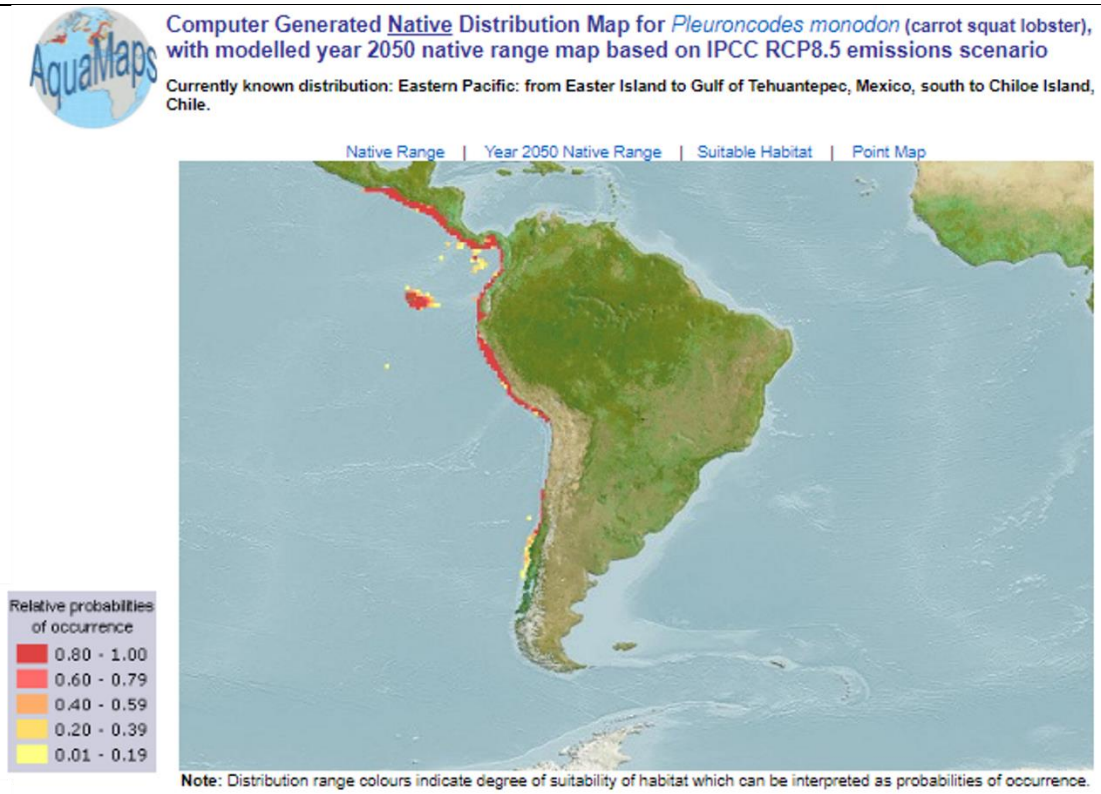

Figure 16. Distribution of Carrot/red squat lobster[3].

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Table D2 - Productivity / Susceptibility attributes and scores.

Productivity attributes	High productivity (Low risk, score = 1)	Medium productivity (medium risk, score = 2)	Low productivity (high risk, score = 3)
Average age at maturity	<5 years	5-15 years	>15 years
Average maximum age	<10 years	10-25 years	>25 years
Fecundity	>20,000 eggs per year	100-20,000 eggs per year	<100 eggs per year
Average maximum size	<100 cm	100-300 cm	>300 cm
Average size at maturity	<40 cm	40-200 cm	>200 cm
Reproductive strategy	Broadcast spawner	Demersal egg layer	Live bearer
Mean Trophic Level	<2.75	2.75-3.25	>3.25

Susceptibility attributes	Low susceptibility (Low risk, score = 1)	Medium susceptibility (medium risk, score = 2)	High susceptibility (high risk, score = 3)
Areal overlap (availability) Overlap of the fishing effort with the species range	<10% overlap	10-30% overlap	>30% overlap
Encounterability The position of the stock/species within the water column relative to the fishing gear, and the position of the stock/species within the habitat relative to the position of the gear	Low overlap with fishing gear (low encounterability).	Medium overlap with fishing gear.	High overlap with fishing gear (high encounterability). Default score for target species
Selectivity of gear type Potential of the gear to retain species	a Individuals < size at maturity are rarely caught	a Individuals < size at maturity are regularly caught.	a Individuals < size at maturity are frequently caught
	b Individuals < size at maturity can escape or avoid gear.	b Individuals < half the size at maturity can escape or avoid gear.	b Individuals < half the size at maturity are retained by gear.
Post-capture mortality (PCM) The chance that, if captured, a species would be released and that it would be in a condition permitting subsequent survival	Evidence of majority released post-capture and survival.	Evidence of some released post-capture and survival.	Retained species or majority dead when released.

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

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.

In Peru, there are two onboard observer programs that report incidental catches in the pelagic fisheries.

One is a public program conducted by the IMARPE's national observer program ("*Programa Bitácoras de Pesca* – PBP", in Spanish). IMARPE has been operating PBP since 1996 and the information obtained with the program allows to characterize the dynamics of the fleet, quantify discards, characterize bycatch, describe the behaviour of the resources, their distribution and demographic structure, and quantify the interaction with superior predators, among others (Joo et al, 2016).

The other program is a private one named SALVAMARES, which was created in 2017 because of the FIP in place for anchovy fishery in northern-central region of Peru. SALVAMARES consists in a system of training crew on-board to collect data on Endangered, Threatened, Protected - ETP interactions (CeDePesca, 2023). In October 2017, SNP and IMARPE signed a specific agreement to collaborate on activities related to this FIP, including workshops on the impacts of the fishery on top predators, bycatch species and ETP species.

Interactions with ETP species are recorded. F.1.1 is met.

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

Specific information about the impacts of the anchovy fishery in southern region of Peru on ETP species is scarce, most of the public data available is from Peru anchovy fishery in general, from industrial anchovy fishery in northern-central of Peru operating with purse-seines or for the industrial fleet of Chile, which are similar fisheries of this assessment, operating under the same conditions.

IMARPE[1] (2023) has reported an increase of interaction of anchovy fishery with birds this year, such as Guanay cormorant - *Phalacrocorax bougainvilli* ("*guanay*", in Spanish), Peruvian booby - *Sula variegate* ("*piquero Peruviano*", in Spanish), Peruvian pelican - *Pelecanus thagus* ("*pelicano*", in Spanish), Inca tern - *Larosterna inca* ("*zarcillo*", in Spanish) and sooty shearwater - *Ardenna grisea* ("*fardela gris*", in Spanish), which were found dead or dying on the hoopers. Apart from Peruvian booby, all these species are listed as "near threatened" by Union for Conservation of Nature's Red List of Threatened Species - IUCN's Red List (BirdLife International[1,2,3], 2018 and 2019). However, IMARPE[1] (2023) believed they might be stressed by the H5N1 bird flu, whose first outbreak was registered in November 2022 and by the coastal 2023 El Niño event, which led to a decrease on the availability of anchovy this year, the food source of the birds. As the birds are weak, they try to catch anchovy from the fishing gears and end up enrolled on the nets.

The available reports of PBP in IMARPE website registered some interactions with sea lions, birds, dolphins and turtles in 2018 and 2019 in northern Peru (IMARPE[2], 2023). The most common sea lion species interacting with the fishery was *Otarida flavensis* ("*lobo chusco*", in Spanish), which is not evaluated by IUCN's Red List. The most common birds interacting with the fishery were the near threatened Peruvian booby and Franklin's Gull - *Larus pipixcan* ("*gaviota de Franklin*", in Spanish), which is listed as "least concern" species by IUCN's Red List (BirdLife International[4], 2018).

From 2015 to 2019, PBB noticed that Pelecaniformes were the seabirds that most interacted with Peruvian fishery (Rivadeneyra-Villafuerte and Román-Amancio 2021) [Figure 15]. The near threatened Sooty shearwater was the most frequently sighted species, followed by the critically endangered waved albatross - *Phoebastria irrorata* ("*albatros de Galápagos*", in Spanish) [BirdLife International[5], 2018] and a genus of unidentified albatrosses (*Thalassarche* sp). The vulnerable pink-footed shearwater - *Ardenna creatopus* (*"pardela de patas rosadas",* in Spanish) [BirdLife International[6], 2018] was also recorded, but in a lower amount.

Tabla 2. Número de registros de aves marinas observadas por año entre el 2015 y 2019 durante los viajes reportados en el Programa Bitácoras de Pesca.

Especie	2015		2016		2017		2018		2019	
	N° de avist.	(%)	N° de avist.	(%)	N° de avist.	(%)	N° de avist.	(%)	N° de avist.	(%)
A. creatopus	20	0,48	7	0,29	76	2,26	19	0,39	63	1,32
A. grisea	333	7,99	208	8,74	247	7,33	352	7,29	499	10,47
P. irrorata	155	3,72	136	5,71	68	2,02	281	5,82	217	4,55
Thalassarche sp.	211	5,06	59	2,48	58	1,72	244	5,05	141	2,96

Figure 17. Number of records of seabirds observed per year between 2015 and 2019. Source: (Rivadeneyra-Villafuerte and Román-Amancio 2021).

ETP catches (including sea birds, marine mammals and reptiles) from a total of 48 observed trips, or 3,146 sets in northern-central Peru (9.8% of total trips undertaken from 28 April – 01 August 2019) is summarised in the last SALVAMARES report (CeDePesca, 2019). The main results are described below.

Regarding seabirds, the species more commonly interacted were: the near threatened Peruvian booby (398 died), the least concern blue-footed booby - *Sula nebouxii* (*"Piquero de patas azules",* in Spanish) [BirdLife International, 2021], the near threatened Peruvian pelican (100 caught but release alive) and the Guanay cormorant (809 died). The population size of these species is large (2,000,000 individuals for blue footed booby population and 3,700,000 individuals for guanay) and the mortality rates are low, representing between 0.02% and 0.3% and of total individuals observed.

Regarding interactions with marine mammals, mortality rate was very low. During that period, 12 common dolphins - *Delphinus capensis* (*"delfín común"*, in Spanish) were caught with one death, 7 released alive and the rest which escape themselves. This dolphin has a "least concern" status, according to IUCN's Red List (Braulik et al., 2021). A total of 7,612 of the least concern southern fur seals - *Arctocephalus australis* (*"lobos finos", in Spanish*) [Cárdenas-Alayza et al, 2016] and 125,306 sea lions (*O. flavescens*) were also observed in that period, but only 2 seals and 53 sea lions died during the fishing operations.

In relation to marine reptiles, four species of turtles interacted with the fishery, the vulnerable olive Ridley turtle - *Lepidochelys olivacea* (*"tortuga golfina o pico de loro"*, in Spanish) [Abreu-Grobois et al, 2018], the endangered green turtle - *Chelonia mydas ("tortuga verde", in Spanish)* [Seminoff, 2004], the vulnerable leatherback turtle - *Dermochelys coriácea ("tortuga dorso de cuero",* in Spanish) [Wallace et al, 2013] and the vulnerable loggerhead turtle - *Caretta caretta ("tortuga cabezona",* in Spanish) [Casale and Tucker, 2017]. All the individuals were released alive.

The observer program conducted by IFOP for the Chilean share of the southern Peruvian anchovy stock provided few data of ETP as well in IFOP (2022). For the Chilean industrial fleet operating in the area, 21 species were reported as interacted with the fishery operations. In that case, sea lions were the most common species, followed by sooty shearwater and Guanay cormorant, which represented 95% of the catches and 83% of the birds mortality (Figure 18).

Tabla 79. Captura y mortalidad incidental por especie en la flota cerquera industrial que operó sobre el recurso anchoveta en la zona norte. Datos provenientes del registro de observadores científicos sobre 3.772 lances de pesca comerciales durante el periodo 2017-2021.

Nombre común	Nombre Científico	Captura	Muertos	Mort (%)	CIP	CV_{CIP}	MIP	CV_{MIP}
Lobo Marino Comun	*Otaria flavescens*	5.338	9	0,17	1,42	360	0,002	2.045
Fardela negra	*Ardenna grisea*	568	390	68,7	0,15	3.400	0,10	3.339
Guanay	*Phalacrocorax bouganvilli*	452	420	92,9	0,12	3.993	0,11	4.266
Delfín común	*Delphinus delphis*	72	23	31,9	0,02	2.183	0,006	2.489
Piqueros	*Sula variegata*	71	59	83,1	0,02	2.097	0,016	2.291
Gaviotín monja	*Larosterna inca*	61	0	0	0,02	6.042	0	0
Delfín oscuro	*Lagenorhynchus obscurus*	56	38	67,9	0,01	2.528	0,010	2.615
Pelicano peruano	*Pelecanus thagus*	31	17	54,8	0,008	2.085	0,005	2.196
Delfín s/i	-	15	0	0	0,004	6.142	0	0
Pingüino de Humboldt	*Spheniscus humboldti*	12	1	8,3	0,003	2.399	0,0003	6.142
Fardela Blanca	*Ardenna creatopus*	8	8	100	0,002	6.142	0,002	6.142
Gaviota garuma	*Leucophaenus modestus*	6	6	100	0,002	6.142	0,002	6.142
Delfín nariz de botella	*Tursiops truncatus*	4	4	100	0,001	6.142	0,001	6.142
Yeco	*Phalacrocorax bouganvilli*	4	4	100	0,001	6.142	0,001	6.142
Tortuga verde	*Chelonia mydas*	3	0	0	0,001	3.545	0	0
Tortuga olivácea	*Lepidochelys olivacea*	3	0	0	0,001	3.545	0	0
Gaviota de Franklin	*Larus pipixcan*	2	2	100	0,001	6.142	0,0005	6.142
Tortuga Laúd	*Dermochelys coriacea*	2	0	0	0,001	4.342	0	0
Albatro Ceja negra	*Thalassarche melanophris*	1	1	100	0,0003	6.142	0,0003	6.142
Tortuga cabezona	*Caretta caretta*	1	0	0	0,0003	6.142	0	0
Lobo fino austral	*Arctocephalus australis*	1	0	0	0,0003	6.142	0	0

s/i: Sin identificar
Mort (%) = Mortalidad = Número de animales muertos/Número de animales capturados
Captura Incidental Promedio (CIP) = Número de animales capturados/Número de lances observados
Coeficiente de Variación Captura Incidental Promedio (CV_{CIP})
Mortalidad Incidental Promedio (MIP) = Número de animales muertos/Número de lances observados
Coeficiente de Variación Tasa Mortalidad Incidental (CV_{MIP})

Figure 18. Capture and incidental mortality by species in the industrial purse seine fleet that operated on the anchovy resource in the northern zone of Chile. Data from the registry of scientific observers on 3,772 commercial fishing hauls during the period 2017-2021. *Nombre común*= common name. *Nombre Científico*= scientific name. *Captura*= catches. *Muertos*: dead. Mort (%) = Mortality = Number of dead animals/Number of captured animals. CIP = Average Incidental Catch = Number of animals captured/Number of hauls observed. CV_{CIP} = Average Incidental Catch Variation Coefficient. MIP = Average Incidental Mortality = Number of dead animals/Number of hauls observed. CV_{MIP} = Variation Coefficient of Incidental Mortality Rate. Source: IFOP (2022).

In general terms, PBP, SALVAMARES and Chilean observer programmes report many interactions of anchovy fishery with ETP species, but the mortality rates were low in Peru (SFP, 2021; CeDePesca, 2019).

There is no substantial evidence that the fishery has a significant negative effect on ETP species. F.1.2 is met.

F1.3 If the fishery is known to interact with ETP species, measures are in place to minimise mortality.
There are several measures in place to minimise the impacts on ETPs species, especially due the FIP that has been developed in Peru. Some of these measures are focused on the northern Peru because of the ongoing FIP occurring there, but several of these measures were applied of the whole country, which includes the southern area.

FishChoice (2019) has summarized measures regarding ETP species:

"The national protection and management of ETP species involves marine protected areas around islands and guaneras areas, as well as prohibition on hunting sea lions, and a prohibition on the possession, trade, transport or export of ETP species. Various government departments monitor the population status of ETP species.

In Peru, multiple different government departments have responsibility for different aspects of ETP management. MINAGRI, the Ministry for Agriculture prohibits the catch and transport of ETP species, SERNANP is the department responsible for protected areas, and SERFOR manages forests and fauna outside of protected areas. Hunting sea lions is prohibited, birds associated with the production of guano are protected. There is a system of MPAs prohibiting fishing around guaneras islands and points.

IMARPE promotes the adoption of Dolphin Safe practices and certification of fisheries. Some of the companies in the FIP use pingers on their nets to deter dolphins. It is not clear whether all the companies do this. It is not a policy of the fishery management or the FIP. However, if one company seems the value in pingers, it can be assumed it reduces dolphin interactions. Independently owned vessels that are not part of the companies within this FIP, do not use pingers on their nets. SERFOR and the Peruvian government has recently published a National Plan for the Conservation of Marine Turtles, approved in December 2019.

IMARPE has a department called the Office of Research on Superior Predators. One of their objectives is to develop indicators of changes in the marine environment. They conduct activities such as the estimation of population abundance, the study of the ecology of food and the study of reproductive parameters of guaneras birds (Peruvian pelican, Peruvian booby, Guanay cormorant, etc), the evaluation of the population abundance of sea lions on the Peruvian coast and monitoring of sea turtles. They conduct research cruises to study the distribution and abundance of birds and cetaceans.

There are overarching national measures designed to protect ETP species. The IHC fishery is not allowed to fish within 5 nm of the coast. This area is allowed to be fished by the DHC fishery. This measure protects many of the islands that are habitat to ETP species, from the disturbance of industrial fishing.

Three major Marine Protected Areas (MPAs), the National Reserve System of Guano Islands, Isles and Capes; the Paracas National Reserve; and the San Fernando National Reserve, covering a total area of 6,305km^2, have been also established in the country to protect coastal habitats and breeding zones for several species of seabirds and marine mammals. A permanent spatial closure of 3 nm along the Peruvian coastline for all fleet was established has been also established and temporal restrictions are in place for the fishery to protect juveniles and breeding seasons for seabirds.

The FIP has implemented a private on-board observer program with the following aims:

- Characterize and estimate the bycatch of the fishery.
- Identify and quantify the species of birds and marine mammals that interact with the fishery.
- Collect information to identify the habitats on which it would be impacting the fishery.
- Provide advice on board to the crew members who are part of the Program "SALVAMARES".

The FIP has also implemented a program called "SALVAMARES", which is a system of training crew on-board to act similar to observers and collect data on ETP interactions. They are also trained in release techniques. The SALVAMARES cover 10% of the fleet. The information can be validated by the observer program which also covers this fleet, and comparisons of the data have been carried out, in order to improve the data collection.

There is a kit which has been developed and recommended for use, which includes devices to aid the release of turtles, dolphins and sharks. For there to be a commitment to implement the kit, it must be approved by the SNP scientific committee first. If the kit is issued to vessels, there should also be a summary of the release training and release kit work that has been occurring, to understand whether this has been applied to all FIP vessels yet.

The spatial overlap of the fishery with bird and mammal nesting areas is low because, with the exception of one island, all other islands are within the 5m inshore zone and therefore the IHC vessels are not allowed to fish there. There is a medium level of temporal overlap between the fishing seasons and the reproductive seasons of the critical TP species (pelicans and fur seals)."

Measures are in place to minimise mortality. F.1.3 is met.

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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.

On 12 April 2023, Peru's National Congress approved some amendments to the LGP Law Nº 25977, with important implications for fisheries management and conservation within the five nautical miles along its coasts, which is an important zone for the reproduction and breeding of multiple coastal species. Since the early 1990s, this has been an area where the fishing activities of industrial fleets have been restricted. The amendments to the law recognize the first five nautical miles adjacent to the Peruvian coast as a protection zone and establish the following measures (OCEANA, 2023):

- Prohibit large-scale fishing within the 5 nautical miles area, without exceptions;
- Prohibit mechanized purse-seiners of any size in the first 3 nautical miles;
- Require the fishing authority to approve a list of the fishing gear that will be allowed in the area, which must exclude any gear that is harmful to the habitat.

The Supreme Decree 012-2001-PE specifically forbids the utilization of the "*antifango",* an unlawful apparatus positioned at the base of fishing nets. This device, when used in shallower waters, disrupts the seabed, causing detrimental effects on the habitat (MBA, 2023).

Peru's marine protected areas encompass an extent of 639,282 hectares, constituting 3.9% of the nation's marine expanse. These designated areas encompass the "Paracas National Reserve", the "Guano Islands and Capes National Reserve" and the "San Fernando National Reserve". As of now, no Vulnerable Marine Ecosystems (VMEs) have been charted within Peruvian waters.

Additionally, the consequences of fishing activities on habitats are linked to physical disruptions that occur when bottom gear comes into contact with the seafloor (ICES 2006). According to the provided definition, fishing gear utilized in pelagic fishing, like purse seines, do not have a direct impact on the seabed. Therefore, it is believed that these gear types do not exert any influence on the habitat (ICES 2006) (Grieve et al, 2014).

Potential habitat interactions are considered in the management decision-making process. Sub-clause F2.1 is met.

F2.2 There is no substantial evidence that the fishery has a significant negative impact on physical habitats.
The consequences of fishing activities on habitats are linked to physical disruptions that occur when bottom gear comes into contact with the seafloor (ICES 2006). According to the provided definition, fishing gear utilized in pelagic fishing, like purse seines, do not have a direct impact on the seabed. Therefore, it is believed that these gear types do not exert any influence on the habitat (ICES 2006) (Grieve et al, 2014).

Data provided by the SALVAMARES for the northern fishery reported a total number of 147 interactions with the seabed in shallow water inlets (5% by number of total inlets fished). Sediments observed on the nets after fishing operations included mud, sand and rock and there was low negative interaction with biogenic structures or benthic species that could be damaged by the net (SALVAMARES 2019).

There is no substantial evidence that the fishery has a significant negative impact on physical habitats. F.2.2 is met.

F2.3 If the fishery is known to interact with physical habitats, there are measures in place to minimise and mitigate negative impacts.
Interaction with benthic habitats is limited, as the purse seine fishery is typically an epipelagic fishery occurring in the water column, so there is no evidence of negative impact with physical habitats.

As indicated above, measures are in place to protect the first nautical miles along its coasts.

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 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 2016).

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.

Although the interaction of the fishery with physical habitats be low, there are measures in place to minimise and mitigate negative impacts. F.2.3 is met.

References

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SALVAMARES 2019. Onboard observer reports. Report No 3 (2019 12pp). https://cedepesca.net/wp-content/uploads/2020/01/2019-10-16_Report-of-the-Private-Observer-Program-on-board.pdf

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.
Anchovy is highly dependent on environmental events, such as the El Niño-Southern Oscillation (ENSO) events which affect upwelling, fish abundance and distribution of the species, often leading to stock crashes and cascading social and economic impacts. Synchronic regime shifts in abundance between anchovy, sardines and other low trophic level (LTL) species from north to south in the Humboldt current large marine ecosystem - HCLME have been also described (Cubillos et al. 2007).

Data on environmental factors (water temperature, phytoplankton and zooplankton, etc) is collected by IMARPE during the hydrographic surveys and are taking into consideration during the assessment of the anchovy stocks. IMARPE also monitors all levels of the ecosystem, from algae up to marine macro-fauna, top predators, marine mammals and birds. According to FishChoice (2019), IMARPE is compiling all datasets into one ecosystem model to evaluate the impact of different fishing pressures.

Due to the low trophic level of the species, anchovy is also a key resource for some marine species in the HCLME, such as ETP species which rely on it. IMARPE has highlighted 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 anchovy. In the report "*Ficha de impacto de la pesquería de Anchovy sobre especies de by-catch y protegidas*" estimation of consumption of each species have been analysed to guaranty the LMTCP set by the authorities at the beginning of each fishing season considers the needs of the entire ecosystem.

The anchovy fishery is managed by the Peruvian government based on methods applied for single-species fisheries. However, management measures are in place to protect the species (temporally spawning and recruitment closures), Minimum Landing Size (MLS), restricted areas and access to the fishery, restriction of bycatches amount, restrictions on juveniles catches, updates on LMTCP according to fishing and environmental biological factors though the year (CDN, 2022), etc; which also protect the environment and the species which rely on it. The increase pressure on the stock exerted in Peru by the reduction industry, due to the growing international demand for fishmeal and fish oil, has led authorities to gradually tighten fisheries management regulations (especially those pertaining to the exploitation of anchovy) towards an Ecosystem Approach to Fisheries (Avadi et al, 2014).

Therefore, the broader ecosystem within which the fishery occurs is considered during the management decision-making process, so sub-clause F3.1 is met.

F3.2 There is no substantial evidence that the fishery has a significant negative impact on the marine ecosystem.
FishChoice (2019) mentioned a publication titled "Impact Study of Anchovy Fishery on By-Catch and Protected Species" (referred to as "*Fichas del Impacto*", in Spanish), which elucidated relationships between various species populations, the anchovy population, and the availability of food during specific reproductive periods. The analysis concluded that these species' dietary necessities have been adequately met in recent years, indicating that the anchovy fishery isn't exerting an adverse influence on species recovery.

IMARPE has attempted to quantify the needs of the HLCME ecosystem and the species which rely on anchovy (IMARPE, 2020). The ecosystem study has shown that the predators with more than 50 % of anchovy in their diets were Peruvian boobies, Guanay cormorants, pelicans, Eastern Pacific bonito, other large pelagic, sea lions, catfishes and fur seals. Predators with more than 2 tons per km^2 per year of anchovy consumption were Eastern Pacific bonito, medium demersal, horse mackerels, other

large pelagic and pacific mackerels. The conclusions of this study 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 % B_0), 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 %.

Moreover, the fishery has no impact on the habitat and a relatively low impact on ETP species. LMTCPs are set by the authorities taking into consideration the predator species which rely on the resource.

It is concluded then that the fishery has not a significant negative impact on the marine ecosystem. Sub-clause F3.2 is met.

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.
Various safeguards have been implemented to preserve distinct tiers of the ecosystem.

Certain islands, designated for bird or marine mammal habitats, are off-limits for fishing, safeguarding their ecological integrity. This protective measure also contributes to minimizing seabed interactions. Notably, marine protected zones encircling islands play a pivotal role in shielding breeding and resting habitats for marine mammals and avian species against disruptions caused by fishing vessels. Moreover, the protected region network encompasses guaneras areas, acknowledging the ecological significance of guano bird habitats. These species are pivotal indicators of the ecosystem's robustness, and the monitoring of their populations remains an ongoing endeavour.

IMARPE's Office of Research on Superior Predators focuses on developing environment-related indicators (FishChoice, 2019). This involves estimating population abundance, analyzing food ecology, studying reproductive parameters of guaneras birds, evaluating sea lion populations along the coast, and monitoring sea turtles. Research cruises assess bird and cetacean distribution and abundance.

Anchovy populations are highly monitored and regulated as well. Within the fishery-specific management system, robust protocols are established to determine the LMTCP, assuring that the stock remains within sustainable biological thresholds. The LMTCP is renewed annually and follows a two-stage release approach, subject to review prior to the second fishing season. For the subsequent fishing season, the LMTCP is determined using IMARPE's stock assessment outcomes. This is done according to a formula outlined in a decision table by IMARPE. The decision table computes the risk of the remaining spawning biomass falling below the biological limit reference point. This assessment considers data from acoustic surveys during closed seasons and landing data, ensuring the LMTCP adapts to the stock's current state.

The ongoing monitoring of juvenile and bycatch percentages occurs in real-time. To address bycatch, regulations stipulate that the catch's bycatch portion must not exceed 5%. Under PRODUCE's jurisdiction, the authority to close the IHC fishery during seasons with high juvenile proportions exists. The specific percentage of juveniles warranting a fishery closure is assessed seasonally. Monitoring the juvenile percentage relies on real-time catch reporting and observer input, while electronic logbooks submitted to PRODUCE record this data for each haul. Although landing over 10% juveniles is forbidden, exceptions are possible if reported immediately for area-specific temporary closures. Such information is included in electronic logbooks submitted to PRODUCE. Temporary closures can be enforced within hours or a few days based on the reported percentage exceeding 10% (FishChoice, 2019).

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. F.3.3 is met.

References

Avadí, Á., Vázquez-Rowe, I. & Fréon. F. 2014. Eco-efficiency assessment of the Peruvian Anchovy steel and wooden fleets using the LCA+DEA framework, Journal of Cleaner Production (2014), http://dx.doi.org/10.1016/j.jclepro.2014.01.047

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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]

Appendix B

MarinTrust Fishery Assessment Peer Review Template

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

Fishery under assessment	Anchovy | Peru | FAO 87
Management authority (Country/State)	Ministry of Production (PRODUCE)
Main species	1. Anchovy (*Engraulis ringens*) 2. Eastern Pacific bonito (*Sarda chiliensis chiliensis*) 3. Chilean jack mackerel (*Trachurus murphyi*) 4. Chub mackerel (*Scomber japonicus*) 5. Carrot/red squat lobster (*Pleuroncodes monodon*)
Fishery location	Area FAO 87, Southern Peruvian stock
Gear type(s)	Purse seine
Overall recommendation. (Approve/ Fail)	Approve

Summary: in this section, provide any additional information about the fishery that the reviewers feel is significant to their decision.
The assessment is comprehensive and very complete. Rationales used and scores seem to be broadly adequate. See my comments in section C and F. Only minor comments in the other sections.
General Comments on the Draft Report provided to the peer reviewer
OK

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 MarinTrust 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			NA
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 MarinTrust standard, and clearly based on the evidence presented in the assessment report?
The assessment report is adequate, it provides the information necessary to justify the scores assigned to the different categories. But please see my comments in C and F.
Certification body response
OK

2. Has the fishery assessment been fully completed, using the recognised MARINTRUST fishery assessment methodology and associated guidance?
Yes, the Marintrust fishery assessment methodology and associated guidance has been adequately and clearly applied to this assessment.
Certification body response
OK

3. Does the Species Categorisation section of the report reflect the best current understanding of the catch composition of the fishery?
Yes. The accompanying fauna is highly variable and influenced by environmental conditions but the information/methodology used seem to be adequate. Five species are included in the catch profile: anchoveta and bonito, jurel, caballa and munida (in low proportions) which differ from the ones selected for the northern-central anchoveta stock and are in line with other reports. In this case, category A, C and D species are identified in the catch.
Certification body response
OK

3M. Are the scores in "Section M – Management" clearly justified?	
Yes, they clearly justified. Just one comment: M1.5 Again my question is about the stakeholder involvement in the management process, specifically for the small-scale sector working in the south of the country.	
Certification body response	
Landings from the artisanal and small-scale fleets should be used for direct human consumption, and only industrial landings are to be used to produce fishmeal. Thus, small-scale fleet is out of the scope of this assessment, but it might participate on decisions regarding anchovy used for direct human consumption.	

3A. Are the "Category A Species" scores clearly justified?
Yes. The information provided is up-to-date and adequate. For this stock MSY reference points are used by the IMARPE and stock is above the target point.
Certification body response
OK

3B. Are the "Category B Species" scores clearly justified?
No category B species identified in the fishery.
Certification body response
OK

3C. Are the "Category C Species" scores clearly justified?
Three category C species included in the assessment: **Eastern Pacific bonito** Justifications and scores adequate, the stock is over the line. Just a quick comment about that. I understand the Spanish caption included in the figure, but I would recommend including in the English caption that the line represents the reference levels. What I am not sure is to which reference levels it refers (MSY, Lim)? **Chilean jack mackerel** Scores Ok, but please explain what the blue line used in the figure represents (target/limit reference point?) **Chub mackerel** Scores Ok.

It is good to see that the IMARPE has included more species in its annual assessment program and it is not everything about anchoveta (as it was in the past).

Certification body response

Eastern Pacific bonito

Thank you, I forgot to translate this part. It refers to MSY. I have added to the caption of Figure 11: "The horizontal lines in purple/blue express the target reference levels (B_{MSY} and F_{MSY})."

Chilean jack mackerel

Thank you, I forgot to translate this part. It refers to MSY. I have added to the caption of Figure 13: "The horizontal lines in purple/blue express the target reference levels (B_{MSY} and F_{MSY})."

Chub mackerel

Yes, a full assessment for each species now is great.

3D. Are the "Category D Species" scores clearly justified?

Yes, only one species (munida) included in this section. A PSA has been conducted. Justification and scores correct. The species passes. No relevant issues found.

Certification body response

OK

3F. Are the scores in "Section F – Further Impacts" clearly justified?

The information provided for supporting the scores are complete and up to date for the habitat component (F2). Interaction of the fishery with that element is limited. Two bycatch data collection programs are in place for the northern anchoveta fishery in Peru but only one (bitacoras de pesca) for the southern fishery.

I would recommend including some extra-information from the IFOP reports to double-check the numbers offered by the SALVAMARES. As you have seen, bycatch (fish) species are different in the northern and southern anchoveta fisheries. Therefore, ETP species impacted by the fisheries can also differ. But yes, I understand interactions are low.

Section F3 scores are mainly based on the northern-central stock. I would try to justify them better with the information provided for the southern stock (or at least justify your scores based on the fact that the southern stock is much smaller than the northern one). I consider that in general the southern anchoveta stock is somehow forgotten by the IMARPE/PRODUCE.

Again, you need to change the "Pass" to "Yes" for F3.3. in the scoring table.

Certification body response

I have added now Figure 18 in F.1.2 with detailed data of captures and incidental mortality by species in the industrial purse seine fleet that operated on the anchovy resource in the northern zone of Chile.

For F3, most of the measures related to ecosystem impacts were applied at national level (temporally spawning and recruitment closures, Minimum Landing Size - MLS, restricted areas and access to the fishery, restriction of bycatches amount, restrictions on juveniles catches, updates on a Maximum Limit of Total Allowable Catch – LMTCP according to fishing and environmental biological factors though the year, marine protected zones, monitoring of juvenile and bycatch). The IMARPE (2020) study that I cited in Figure 3.2 attempted to quantify the needs of the Humboldt current large marine ecosystem - HLCME ecosystem and the species which rely on anchovy and has included the southern stock: "The modelled area extended from 3°S to 18°S and with an offshore extent to 100 nm from the coast, covering approximately 453000 km^2. Forty-five living functional groups and a detritus box were included in the model (Fig. 1). Anchovies (Northern-Central and Southern stocks), sardines and hakes were structured into 2 size groups (small and large) to account for diet changes between life stages." It seems to me that most of the scores of section F1 were based on northern-central stock, not F3. Thus, it made more sense to me to add this comment on F.1.3: "There are several measures in place to minimise the impacts on ETPs species, especially due the FIP that has been developed in Peru. Some of these

measures are focused on the northern Peru because of the ongoing FIP occurring there, but several of these measures were applied of the whole country, which includes the southern area." I agree that it seems most of efforts have been focused on northern stock, but southern stock has been affected positively for these measures as government has expanded decisions made on findings of the northern FIP to the management of fisheries in general in the country.

References

IMARPE. 2020. Ecosystem impacts of fishing the low trophic level Peruvian anchovy in the Northern Humboldt Current Ecosystem. https://cedepesca.net/wp-content/uploads/2021/01/Tam-Ecosystem-impacts-2020.pdf

Optional: General comments on the Peer Review Draft Report

Certification body response

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)