MarinTrust Standard V2

Whole fish Fishery Assessment

Anchovy, Chile Zones XV-IV

MarinTrust Programme
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Table 1 Application details and summary of the assessment outcome

Application details and summary of the assessment outcome			
Name(s): Blumar			
Country:			
Email address:		**Applicant Code:**	
Certification Body Details			
Name of Certification Body:		LRQA	
Assessor Name	**CB Peer Reviewer**	**Assessment Days**	**Initial/Surveillance/ Re-approval**
Sam Peacock	Kate Morris	2.5	Surveillance
Assessment Period	October 2022 – October 2023		
Scope Details			
Management Authority (Country/State)	Chile – SUBPESCA & SERNAPESCA		
Main Species	Anchovy (*Engraulis ringens*)		
Fishery Location	Chile, Zones XV-IV		
Gear Type(s)	Purse seine		
Outcome of Assessment			
Overall Outcome	PASS		
Clauses Failed	NONE		
CB Peer Review Evaluation	Pass		
Fishery Assessment Peer Review Group Evaluation	Approve		
Recommendation	Maintain fishery approval		

Table 2. Assessment Determination

Assessment Determination
In the majority of areas, there have been no notable changes to the fishery since the time of the 2021 re-approval assessment. The fishery management framework remains in place, with a solid legal basis, a commitment to sustainability, and a transparent and collaborative approach to decision-making. There have been no significant changes to control and enforcement, and there is no evidence of widespread non-compliance. The potential impacts of the fishery on seabed habitats remain minimal, and the importance of anchovy as a prey species continues to be factored into fishery management decisions including TAC setting. One key new piece of evidence was the publication in late 2021 of a report detailing the findings of the scientific observer programme, particularly in relation to the bycatch, discarding, and incidental mortality of Chilean pelagic fisheries. The detailed analysis of bycatch rates permitted an update of the catch composition data for this assessment, and likewise an updated Species Categorisation section for this report. Where previous MT assessments have included anchovy, pilchard, jack mackerel and chub mackerel, this surveillance report considers only anchovy and jack mackerel. No other species formed more than 0.1% of landings in observed fishing sets. As in previous MT assessments, anchovy has been assessed as two separate stocks, a Northern stock and a North-Central stock. Both are subject to management relative to reference points and have been assessed under Category A. Jack mackerel is also managed relative to reference points and has been assessed under Category C. The data collection and stock assessment process for the two anchovy stocks remains largely unchanged since the re-approval assessment. Scientific authorities consider the Northern stock to currently be under-exploited, and the North-Central stock to be appropriately exploited. Biomass for both stocks is above the target reference point, and TACs continue to be set in line with the scientific advice. The targeted Chilean jack mackerel fishery is currently MT-approved. A stock assessment is conducted annually by the South Pacific Regional Fisheries Management Organisation (SPRFMO). The stock structure of jack mackerel in the South-East Pacific is not certain; however, under both two main hypotheses, the stock(s) are currently estimated to have biomass above the target reference point. Finally, the 2021 observer programme report also permitted an update of the ETP section of this assessment report (Section F1). The new evidence indicates that interactions between the industrial pelagic fishery and ETP species are very uncommon, and there was no evidence of ETP mortalities. Measures identified by the re-approval assessment which are in place to minimise bycatch of seabirds, marine mammals and turtles remain in place. Overall, there are no changes in the situation of the fishery which would necessitate the removal of its approved status. The fishery should remain an approved source of raw materials for MT-certified marine ingredients.
Fishery Assessment Peer Review Comments
The whole fishery under assessment here is the Anchovy (*Engraulis ringens*) fishery which is pursued by Chilean and international vessels in Chiles Fisheries Management Regions XV-IV. Anchovy is managed by the South Pacific Regional Fisheries Management Organisation (SPRFMO), the Chilean Ministry (MINECOM) and the Instituto de Fomento Pesquero (Fisheries Development Institute, IFOP. Jack mackerel is also caught as a by-catch species and is also managed by the same Chilean agencies. For this Marin Trust assessment, Anchovy is scored as a category A species and Jack mackerel is scored as a category C species. Additional species recorded in the catch but at a much lower % of the overall catch, are Pilchard and Jellyfish. All species scoring tables have been completed by the auditor with sufficient evidence presented to support their final determination.

As the fishery uses purse seines which are deployed in the pelagic environment, the associated impact on ETP species, habitats and the wider ecosystem is duly considered. ETP interactions are discussed in detail and indicate there has not been a significant number of incidental capture events. The peer review supports the auditor's recommendation to Pass this fishery under the Marin Trust IFFO RS v2.0 whole-fishery standard for the production of fishmeal and fish oil.
Notes for On-site Auditor

Table 3 General Results

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

Table 4 Species- Specific Results

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

Category	Species	% landings	Outcome (Pass/Fail)	
Category A	Anchovy (*Engraulis ringens*)	>95%	A1	PASS
			A2	PASS
			A3	PASS
			A4	PASS
Category B	No Category B Species			
Category C	Jack mackerel (*Trachurus murphyi*)	1.6%	PASS	
Category D	No Category D Species			

Table 5 Species Categorisation Table

Common name	Latin name	Stock	IUCN Redlist Category[1]	% of landings	Management	Category
Anchovy	*Engraulis ringens*	North (Zones XV-II)	Least Concern[2]	>95%	Yes	A
Anchovy	*Engraulis ringens*	North-Central (Zones III & IV)	Least Concern[2]		Yes	A
Jellyfish	*Scyphozoa*	n/a	No species identified	2.7%	No	D
Jack mackerel	*Trachurus murphyi*	South-East Pacific	Data-Deficient[3]	1.6%	Yes	C

Species categorisation rationale

The 2021 re-approval MT assessment for anchovy in Chile Zones XV-IV included four species, on the basis that there was no new information to change the catch composition data since the previous MT assessments. These four species were anchovy (*Engraulis ringens*); pilchard (*Sardinops sagax*); jack mackerel (*Trachurus murphyi*); and chub mackerel (*Scomber japonicus*). A recent report providing a detailed analysis of the outputs of the Chilean fishery observer programme, which generally operates in December and January, provides an updated indication of the catch composition in the anchovy fishery[4]. Section 5.2.4 of the report lists the estimated catch composition for trips on which an observer was present. Based on 15.6% observer coverage of the industrial anchovy fishery in the North zone (XV-II), the main retained species were as follows:

- Anchovy, *Engraulis ringens*, 95.6%
- Jellyfish, 2.7%
- Jurel (jack mackerel), *Trachurus murphyi*, 1.6%

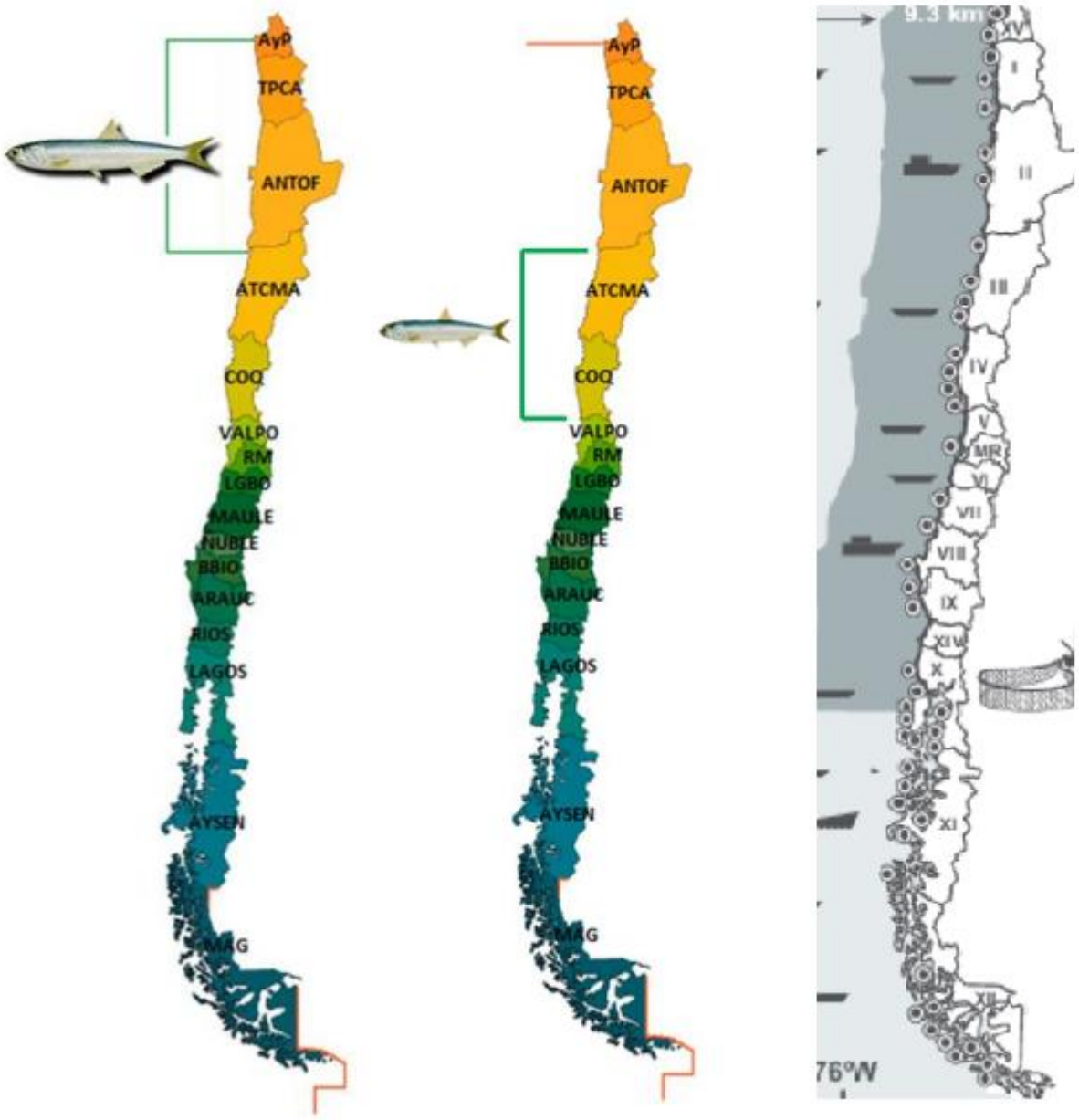
Additional retained species which represented less than 0.1% of the catch were langostino enano (squat lobster, *Munida gregaria*) and chub mackerel (*Scomber japonicus*). Pilchard was not recorded as occurring in the catch. Therefore, the only species which are caught in quantities which require inclusion in this assessment are anchovy and jack mackerel. The term "Jellyfish" does not represent a single species but rather any species within the class *Scyphozoa*. However, as jellyfish are not subject to a management regime and make up a small proportion of the catch, they has been included in this assessment using the risk-based Category D approach.

There are two distinct anchovy stocks within the area covered by this assessment. The Northern stock extends between Chilean Zones XV-II, from Arica y Parinacota to Antofagasta. The North-Central stock is distributed in Zones III and IV, which are the Atacama and Coquimbo regions (see maps below). Both stocks are managed relative to reference points using annual quotas, and have therefore been assessed under Category A.

Jack mackerel is subject to an international management regime coordinated by the South Pacific Regional Fisheries Management Organisation (SPRFMO), and has therefore been assessed under Category C. The Chilean fishery targeting jack mackerel is currently MT-approved.

Note: Previous MT assessments have indicated that only landings from the industrial pelagic fleet are used by the applicant. However, the observer programme report indicates that the artisanal fishery lands almost exclusively anchovy (around 99.95%)[4], and therefore should this need to be included in future assessments the catch composition should not be significantly affected.

[1] https://www.iucnredlist.org/
[2] https://www.iucnredlist.org/species/183775/102904317
[3] https://www.iucnredlist.org/species/183965/8207652
[4] FINAL REPORT: Performance of the catch and discard research and monitoring programme for bycatch in pelagic fisheries, 2020-2021. Published September 2021. https://www.ifop.cl/wp-content/contenidos/uploads/RepositorioIfop/InformeFinal/2021/P-581168.pdf



Maps of Chile showing the location of the Northern anchovy stock (left)[5]; the location of the North-Central stock (middle)[5]; and the numerical administrative Zones (right)[6].

[5] Status of the principle Chilean fisheries, 2021. SUBPESCA. https://www.subpesca.cl/portal/618/articles-114817_recurso_1.pdf

[6] Gelcich, S., Hughes, T.P., Olsson, P., Folke, C. (2010). *Navigating transformations in Governance of Chilean Marine Coastal Resources*. PNAS 107(39): 16749-9. https://www.researchgate.net/publication/46255495_Navigating_Transformations_in_Governance_of_Chilean_Marine_Coastal_Resources

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

There have been no substantial changes in the aspects of the fishery which relate to Section M1 since the time of the 2021 re-approval. The information from the previous report is summarised here for convenience; please refer to the 2021 report itself for more details.

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

Fisheries management in Chilean waters is primarily the responsibility of the Subsecretariat de Pesca (Undersecretariat of Fisheries, SUBPESCA) within the Ministry of Economy, Development and Tourism (MINECON) (SUBPESCA, 2022). SUBPESCA is supported by the Servicio Nacional de Pesca (National Fisheries Service, SERNAPESCA), which has responsibility for executing fisheries policy through enforcement (SERNAPESCA, 2022). Additionally, support and coordination on the management of international stocks are provided by the South Pacific Regional Fisheries Management Organisation (SPRFMO). Although anchovy is outside the jurisdiction of the SPRFMO, the organisation does cover the jack mackerel fishery.

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

Data collection and stock assessment are the responsibility of the Instituto de Fomento Pesquero (Fisheries Development Institute, IFOP). IFOP was created in 1964 and is also responsible for sampling stocks and conducting acoustic surveys (IFOP, 2022). In relation to the anchovy fishery, the work of IFOP is supported by the Comité Cientifico Técnico de Pesquerias de Pequeños Pelágicos (Scientific and Technical Committee for Small Pelagic Fisheries, CCT-PP). The CCT-PP analyses stock assessments and catch projections, and makes official recommendations to the authorities (SUBPESCA, 2022a).

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

The stated mission of SUBPESCA is to "Regulate and manage fishing and aquaculture activity, through policies, regulations and management measures, under a precautionary and ecosystem approach that promotes the conservation and sustainability of hydrobiological resources for the productive development of the sector" (translated from SUBPESCA, 2022). The stated mission of IFOP is "To advise national fishery and aquaculture institutions decision making processes, through the elaboration of public value scientific and technical backgrounds for the administration and sustainability of fishery resources, aquaculture and their ecosystems" (translated from IFOP, 2022a).

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

Fisheries management in Chile has its legal basis in the Ley General de Pesca y Acuicultura (General Fisheries and Aquaculture Law, LGPA), most recently updated in 2013. The LGPA includes, amongst others, commitments to ensure the sustainable use and conservation of marine resources; to ensure scientific information is at the core of decision-making on sustainability issues; and to develop and review Fishery Management Plans for key fisheries (SUBPESCA, 2013). Additionally, SUBPESCA Resolution 291/2016 includes a commitment to manage stocks at the MSY level.

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

Consultation on the development, revision, and implementation of FMPs occur through the CCT-PP and the National Fisheries Council.

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

Information is made available on the SUBPESCA and IFOP websites, including CCT-PP proceedings and other aspects of the decision-making process.

References

IFOP (2022). "About Us". https://www.ifop.cl/en/quienes-somos/

IFOP (2022a). "Strategic Plan". https://www.ifop.cl/en/quienes-somos/plan-estrategico/

Ley General de Pesca y Acuicultura. https://www.subpesca.cl/portal/615/w3-article-88020.html

SERNAPESCA (2022). "What is SERNAPESCA?". http://www.sernapesca.cl/que-es-sernapesca

SUBPESCA (2013). SUBPESCA Newsletter, New General Law on Fisheries and Aquaculture, No 20,657. https://www.subpesca.cl/portal/617/articles-60001_recurso_1.pdf

SUBPESCA (2022). "About the Undersecretariat". https://www.subpesca.cl/portal/616/w3-propertyvalue-538.html

SUBPESCA (2022a). "Scientific Committee on Small Pelagic Fisheries". https://www.subpesca.cl/portal/616/w3-propertyvalue-51142.html

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

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

There have been no substantial changes in the aspects of the fishery which relate to Section M2 since the time of the 2021 re-approval. The information from the previous report is summarised here for convenience; please refer to the 2021 report itself for more details.

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

Compliance is primarily the responsibility of SERNAPESCA, which carries out inspections, implements surveillance mechanisms and enforces compliance. The stated mission of SERNAPESCA is to "contribute to the sustainability of the sector and the protection of hydrobiological resources and their environment, through comprehensive supervision and management that influences sectoral behavior by promoting compliance with regulations" (translated from SERNAPESCA, 2022). The work of SERNAPESCA is supported by the Chilean navy, which patrols an area of 4.5 million km^2 within the Chilean EEZ.

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

The LGPA defines a range of sanctions for offences, including fines, suspension or revocation of fishing licence, and confiscation of catch and/or gear. The LGPA also details the range of offences for which these sanctions can be applied.

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

As at the time of the previous MT assessment, there does not appear to be any evidence of widespread non-compliance in the fishery and no new evidence was encountered during the completion of this surveillance assessment.

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.

The industrial pelagic fishery operates under mandatory VMS monitoring, and since 2020 a video camera monitoring system has been installed on the entire industrial fleet. SERNAPESCA conduct inspections and implement surveillance measures. There is also an on-board observer programme with approximately 16% coverage in the industrial fleet.

References

Ley General de Pesca y Acuicultura. https://www.subpesca.cl/portal/615/w3-article-88020.html

SERNAPESCA (2022). "What is SERNAPESCA?". http://www.sernapesca.cl/que-es-sernapesca

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.**

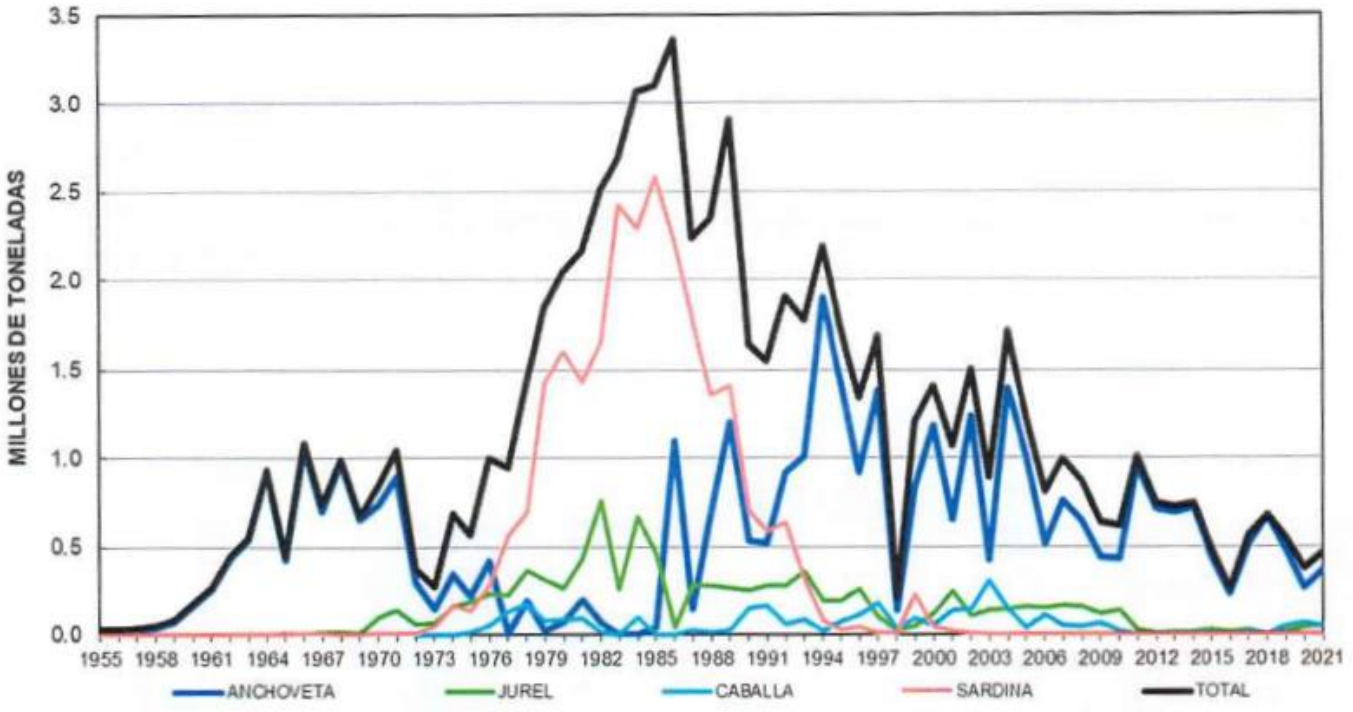
Species Name	**Anchovy: North Stock and North-Central Stock**	
A1	**Data Collection - Minimum Requirements**	
A1.1	Landings data are collected such that the fishery-wide removals of this species are known.	PASS
A1.2	Sufficient additional information is collected to enable an indication of stock status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

As in previous MT assessments, both anchovy stocks are considered here in a single Category A analysis. This reflects the considerable overlap in approach, information and methodology applicable to the stocks, and as such minimises repetition.

There have been no substantial changes in the aspects of the fishery which relate to Section A1 since the time of the 2021 re-approval. The information from the previous report is summarised here for convenience; please refer to the 2021 report itself for more details.

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

Landings data are collected through self-reporting logbooks, port sampling of landings by SERNAPESCA inspectors, and observer coverage. Fishery removals for both anchovy stocks are known, and A1.1 continues to be met.



Landings in Chilean pelagic fisheries, by species, 1955 – 2021 (SUBPESCA 2022)

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

Stock assessments are supported by data collected by the observer programme and acoustic surveys. IFOP has developed a small pelagic monitoring programme for the northern component of the fisheries, with the objective of analysing and reporting on the variables and indicators of the main fishery resources in the area. Acoustic surveys are conducted by the Instituto de

Investigacion Pesquera del Norte (INPESNOR) and are used to estimate current biomass levels and likely future biomass through estimation of recruitment rates (SUBPESCA 2022a).

References

SUBPESCA (2022). Comité Cientifico Técnico de Pesquerias de Pequeños Pelágicos, Informe Tecnico N° 03/2022. https://www.subpesca.cl/portal/616/articles-116402_documento.pdf

SUBPESCA (2022a). Comité Cientifico Técnico de Pesquerias de Pequeños Pelágic, Acta de Sesion N° 06 – 2022. https://www.subpesca.cl/portal/616/articles-116116_documento.pdf

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

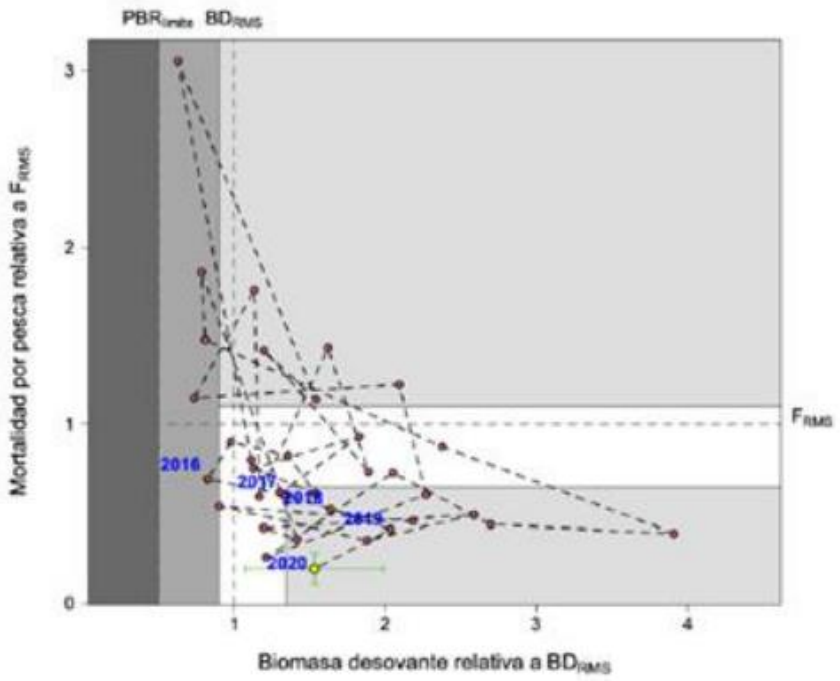
A2.1 A stock assessment is conducted at least once every 3 years (or every 5 years if there is substantial supporting information that this is sufficient for the long-term sustainable management of the stock), and considers all fishery removals and the biological characteristics of the species.

Stock assessments are conducted by IFOP twice per year. The IFOP assessment model covers the entirety of each stock and considers fishery and survey data. Biomass and fishing mortality reference points are dynamic and are recalculated annually. The Northern anchovy stock is distributed in both Chilean and Peruvian waters, Peruvian fishery data is incorporated into the assessment of the stock. Stock assessments are conducted more frequently than once every three years and so A2.1 is met.

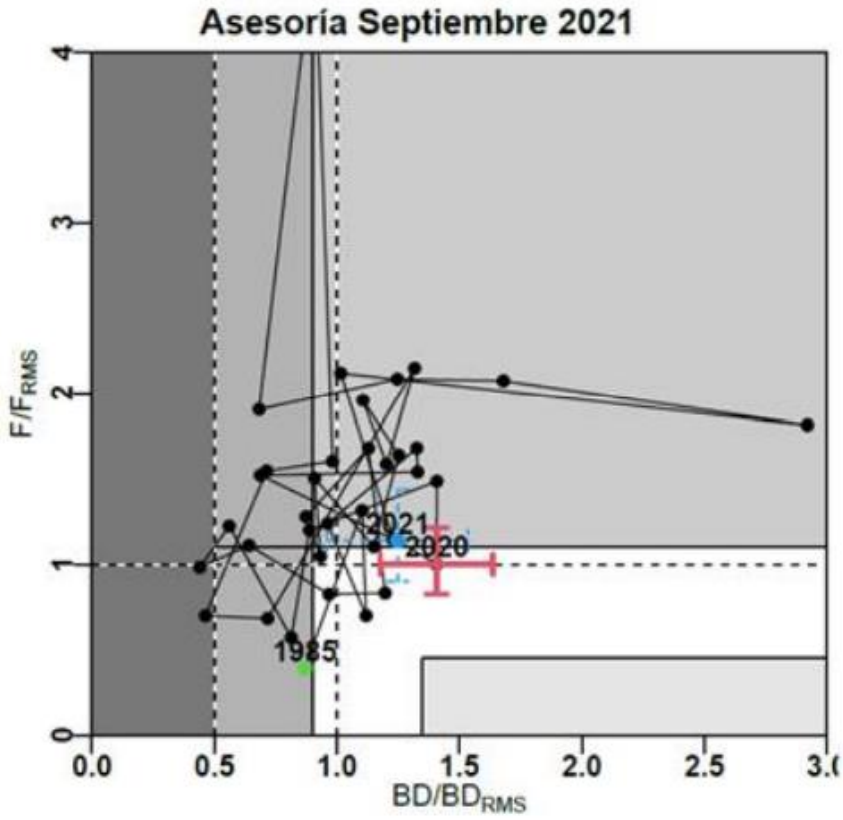
A2.2 The assessment provides an estimate of the status of the biological stock relative to a reference point or proxy.

Stock assessments provide an indication of the status of each stock relative to dynamic reference points. The most recent stock assessment assigned the following reference points (SUBPESCA 2022):

- Northern stock: proxy F_{MSY} ($F_{55\%\ BDPR}$) = 0.86; proxy B_{MSY} (55% BDPR (50%B0)) = 647,000t; B_{lim} (25% b0) = 323,500t.
- North-Central stock: proxy F_{MSY} ($F_{60\%\ BDPR}$) = 0.84; proxy B_{MSY} (60% BDPR (55%B0)) = 52,000t; B_{lim} (27.5% b0) = 26,000t.



Current and historical status of the Northern anchovy stock. X-axis indicates biomass relative to reference points; y-axis indicates fishing mortality relative to reference point. Yellow dot is the estimated status in 2020, with green bars indicating 95% confidence intervals (SUBPESCA 2022b)



Current and historical status of the North-Central anchovy stock. X-axis indicates biomass relative to reference points; y-axis indicates fishing mortality relative to reference point. Red dot is the estimated status in 2020, with red bars indicating 95% confidence intervals (SUBPESCA 2022b)

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

A recommendation on quota for the upcoming season is made by the CCT-PP, based on the outcomes of the stock assessment, for each anchovy stock. The most recent advice, for the 2023 season, recommended a maximum TAC of 749,700t for the Northern stock, and of 35,040t for the North-Central stock (SUBPESCA 2022).

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

As at the time of the re-approval, all stock assessments continue to be subject to internal peer review by IFOP and are also peer-reviewed by the CCT-PP. Additionally, CCT-PP recommendations are produced as a collaborative process via the Committee's meetings. Peer reviewers external to the Chilean fishery management process are also called upon on occasion to ensure continuing accuracy.

A2.5 The assessment is made publicly available.

Stock assessment inputs, procedures, and outcomes are made available online, primarily through the SUBPESCA website. Proceedings and conclusions of CCT-PP meetings are also made publicly available (SUBPESCA 2022a). All information required to update the re-approval and complete this assessment was available online without needing to be requested.

References

SUBPESCA (2022). Comité Cientifico Técnico de Pesquerias de Pequeños Pelágic, Acta de Sesion Nº 06 – 2022. https://www.subpesca.cl/portal/616/articles-116116_documento.pdf

SUBPESCA (2022a) Comité Cientifico Técnico de Pesquerias de Pequeños Pelágic, committee information hub. https://www.subpesca.cl/portal/616/w3-propertyvalue-51142.html

SUBPESCA (2022b). Status of the principle Chilean fisheries, 2021. https://www.subpesca.cl/portal/618/articles-114817_recurso_1.pdf

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

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

There have been no changes to the quota system since the time of the 2021 re-approval assessment. Fishing mortality is restricted through the implementation of an annual quota, based on the recommendations of the CCT-PP. TACs are divided into artisanal, industrial and research components. TACs are set at the start of the fishing season but are subject to change as a result of in-year fishery and acoustic surveys. The LGPA requires that catch recommendations be provided as a range, with the lower boundary set at 80% of the highest recommendation. In addition to the TAC, temporary closures are frequently ordered to protect juveniles and spawning aggregations, with closures lasting a minimum of one week. Overall fishing mortality is monitored relative to reference points.

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.

The 2021 re-approval assessment concluded that TACs are set in line with the scientific advice. Since that time, the 2022 TACs have also been set. The recommended maximum TACs for 2022 for the Northern and North-Central stocks were 751,300t and 51,287t respectively (SUBPESCA 2021). The final quotas for 2022 were as follows (SUBPESA 2022):

- For the Northern stock: 115,839t artisanal, 629,806t industrial, 137t scientific, 7,513t for unforeseen circumstances, and 3,005t for human consumption. Total = 751,300t.
- For the North-Central stock: 25,602 artisanal, 25,602t industrial, and 83t scientific. Total = 51,287t.

As the TAC has continued to be set in line with the advice, and landings continue to be in line with the TAC, A3.2 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).

There have been no significant changes in this area since the 2021 re-approval. The LGPA does not establish catch restrictions when a stock is found to be below the limit reference point; rather, a resource recovery plan must be implemented. Management committees are engaged to design and implement such management plans. There is also clear evidence of a reduction in fishing pressure being an inevitable outcome of falling stock biomass.

References

SUBPESCA (2021). Comité Cientifico Técnico de Pesquerias de Pequeños Pelágic, Acta de Sesion Nº 06 – 2021. https://www.subpesca.cl/portal/616/articles-112739_documento.pdf

SUBPESCA (2022). Status of the principle Chilean fisheries, 2021. https://www.subpesca.cl/portal/618/articles-114817_recurso_1.pdf

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

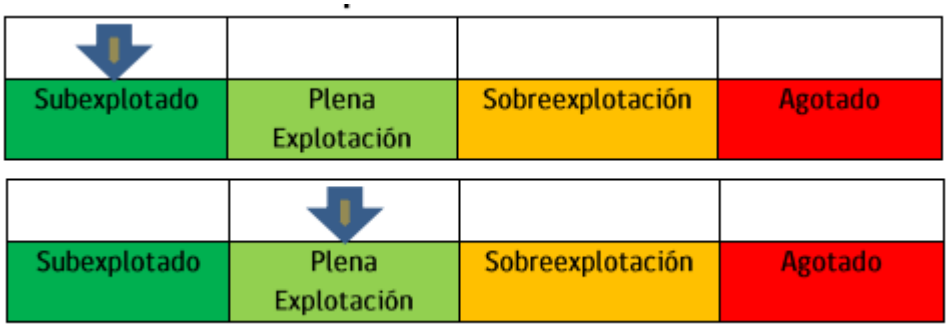
A4	**Stock Status – Minimum Requirements**		
	A4.1	The stock is at or above the target reference point, OR IF NOT: The stock is above the limit reference point or proxy and there is evidence that a fall below the limit reference point would result in fishery closure OR IF NOT: The stock is estimated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

Both the Northern and North-Central stocks were estimated in their most recent stock assessments to have biomass levels above the target and limit reference points. The Northern stock is considered to be under-exploited, with biomass estimated to be 2.39 times larger than SSB_{MSY} and fishing mortality at 0.23 F_{MSY}. The North-Central stock is considered appropriately exploited, with biomass estimated to be 1.15 times larger than SSB_{MSY} and fishing mortality at 1.7 F_{MSY} (SUBPESCA 2022).



Fishery Status for the Northern (top) and North-Central (bottom) anchovy stocks (SUBPESCA 2021).

As both stocks are currently estimated to have a biomass larger than the target reference point, both meet the requirements of A4.1.

References

SUBPESCA (2021). Status of the principle Chilean fisheries, 2021. SUBPESCA. https://www.subpesca.cl/portal/618/articles-114817_recurso_1.pdf

SUBPESCA (2022). Comité Cientifico Técnico de Pesquerias de Pequeños Pelágic, Acta de Sesion N° 06 – 2022. https://www.subpesca.cl/portal/616/articles-116116_documento.pdf

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

CATEGORY B SPECIES

Category B species are those which make up greater than 5% of landings in the applicant raw material, but which are not subject to a species-specific research and management regime sufficient to pass all Category A clauses. If there are no Category B species in the fishery under assessment, this section can be deleted.

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

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

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

TABLE B(A) – F, B AND REFERENCE POINTS ARE AVAILABLE

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

If the biomass / fishing pressure risk assessment is not possible

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

TABLE B(B) – NO REFERENCE POINTS AVAILABLE. B = CURRENT BIOMASS; B_{AV} = LONG-TERM AVERAGE BIOMASS; F = CURRENT FISHING MORTALITY; F_{AV} = LONG-TERM AVERAGE FISHING MORTALITY.

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

Assessment Results

Species Name		**N/A**
B1	Species Name	
	Table used (Ba, Bb)	
	Outcome	
References		
Links		
MarinTrust Standard clause		**1.3.2.2, 4.1.4**
FAO CCRF		**7.5.1**
GSSI		**D.5.01**

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		**Jack Mackerel**	
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.	PASS
	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.	PASS
		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.

Jack mackerel in the South-East Pacific has been subject to annual stock assessments conducted on behalf of the SPRFMO since 2013. The stock assessment incorporates all available international catch data from the SPRFMO signatory nations, including Chile (SPRFMO 2022). It also considers maturity-at-age, weight-at-age. Natural mortality and growth function data (SPRFMO 2021). The full details of the stock assessment process, assumptions, and source data are made available online (SPRFMO 2015).

Although stock assessments do not comment directly on the scale of jack mackerel landings in the anchovy fishery relative to the targeted jack mackerel fishery, these are likely to be small. The total 2022 anchovy quota for both stocks in this assessment is 802,587t (SUBPESCA 2021). Assuming a jack mackerel bycatch rate of 1.6%, this suggests the total jack mackerel catch in the anchovy fishery will be around 12,000t. By comparison, the total international catch of jack mackerel in 2021 was estimated to be 807,566t (SPRFMO 2021a).

The bycatch of jack mackerel in the anchovy fishery is included in the jack mackerel stock assessment process and is small relative to the targeted jack mackerel fishery. C1.1 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 annual jack mackerel stock assessment considers two possible stock structures: a single stock across the entire South-East Pacific; and two separate stocks, one Northern and one Southern. The most recently available stock assessment was published in 2021 and concluded for all three possible stocks that SSB is above the target reference point (and therefore also above the limit reference point) (SPRFMO 2021).

Summary of stock assessment outcomes for Southeast Pacific jack mackerel in 2021. Estimated Spawning Stock Biomass (SSB), SSB_{MSY}, fishing mortality (F), and F_{MSY} for (1) the combined stock assumed by the single-stock hypothesis, and (2) the separate southern and northern stocks assumed by the two-stock hypothesis. MSY values are a function of time-varying selectivity and average weight. Reconstructed from multiple tables in the SPRFMO technical annexe (SPRFMO 2021).

Hypothesis / Stock	SSB	SSB_{MSY}	F	F_{MSY}
Single stock hypothesis	9,960,000t	5,495,000t	0.08	0.13
Two-stock hypothesis, southern stock	7,621,000t	4,798,000t	0.08	0.13
Two-stock hypothesis, northern stock	2,936,000t	603,000t	0.03	0.09

Biomass and fishing mortality reference points are calculated dynamically and updated for each new stock assessment. As can be seen in the table above, under the single-stock hypothesis SSB_{MSY} was estimated to be around 5.5 million tonnes, against an

actual SSB of 9.9 million tonnes. Under the two-stock hypothesis, SSB_{MSY} for the southern stock was estimated to be around 4.8 million tonnes against an actual SSB of 7.6 million tonnes; and SSB_{MSY} for the northern stock was estimated to be 603,000t against an actual SSB of 2.9 million tonnes (SPRFMO 2021). Biomass under both stock hypotheses is therefore estimated to be above the limit reference point, and C1.2 is met.

References

SPRFMO (2015). SPRFMO Scientific Committee. Report of the 2015 data workshop, Port Vila, Vanuatu, 26-28 September 2015. http://www.sprfmo.int/assets/Meetings/Meetings-2013-plus/SC-Meetings/3rd-SC-Meeting-2015/Data-Workshop/SC03-DataWorkshopReport-6Oct15.pdf

SPRFMO (2021). SPRFMO SC9-Report, Annex 10. Jack mackerel technical annex. https://www.sprfmo.int/assets/2021-SC9/Report/SC9-Report-Annex-10-Jack-mackerel-Technical-advice-RS.pdf

SPRFMO (2021a). SPRFMO Scientific Committee. 9th Scientific Committee meeting report, 27/28 September – 2/3 October 2021, Remote meeting. https://www.sprfmo.int/assets/2021-SC9/Report/SC9-Report-Final.pdf

SPRFMO (2022). SC10-JM01, *Trachurus murphyi* catch history. https://www.sprfmo.int/assets/02-SC10/Meeting-Papers/SC10-JM01-CJM-catch-data.pdf (catch data at annex 1, https://www.sprfmo.int/assets/02-SC10/Meeting-Papers/SC10-JM01-Annex1-CJM-catch-history-data.xlsx).

SUBPESCA (2021). Status of the principle Chilean fisheries, 2021. SUBPESCA. https://www.subpesca.cl/portal/618/articles-114817_recurso_1.pdf

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

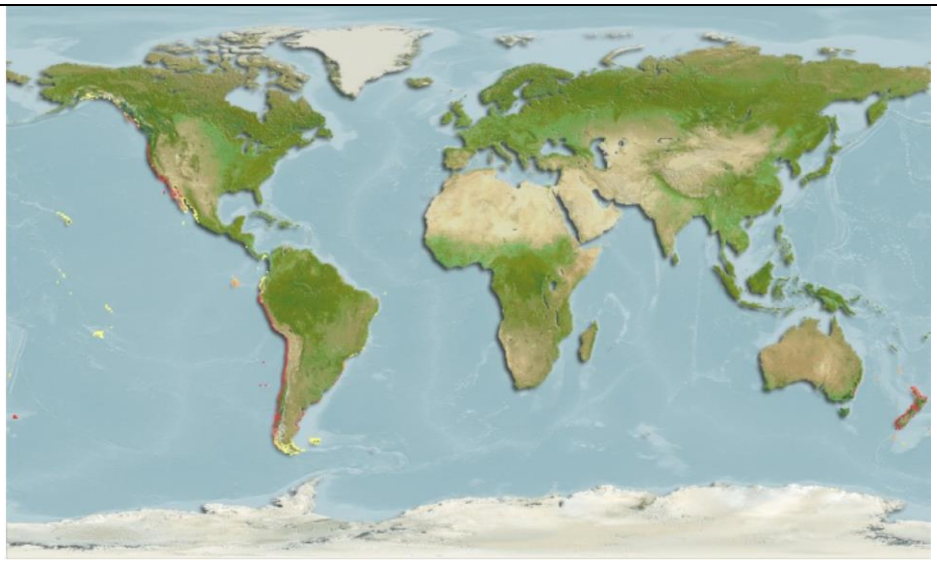
CATEGORY D SPECIES

D1	Species Name	Jellyfish	
	Productivity Attribute	**Value**	**Score**
	Average age at maturity (years)	<18 months[2]	1
	Average maximum age (years)	<18 months[2]	1
	Fecundity (eggs/spawning)	Unknown	-
	Average maximum size (cm)	40cm[1]	1
	Average size at maturity (cm)	<40cm[1]	1
	Reproductive strategy	Unknown, but likely broadcast spawning[2]	1
	Mean trophic level	Unknown	-
		Average Productivity Score	**1**
	Susceptibility Attribute	**Value**	**Score**
	Availability (area overlap)	<10% overlap	1
	Encounterability (the position of the stock/species within the water column relative to the fishing gear)	High overlap	3
	Selectivity of gear type	Small individuals escape	1
	Post-capture mortality	Majority dead	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

Observer data for the fishery indicates that around 2.7% of catch is jellyfish of the Class *Scyphozoa*. This encompasses a large number of potential species, none of which are subject to management measures and none of which are particularly well understood. For the purpose of this assessment, Productivity and Susceptibility values have been estimated based on available information for the South American sea nettle, *Chrysaora plocamia*, a common jellyfish species in Chilean waters.



Computer-generated distribution map for South-American Sea Nettle. From SeaLifeBase, https://www.sealifebase.ca/summary/Chrysaora-plocamia.html

References

1: Schiariti A, Dutto M, Pereyra D, Failla Siquier G, Morandini A. Medusae (Scyphozoa and Cubozoa) from southwestern Atlantic and Subantarctic region (32-60°S, 34-70°W): species composition, spatial distribution and life history traits. Lat. Am. J. Aquat. Res.. 2018;46(2): 240-257. Available from: doi:10.3856/vol46-issue2-fulltext-1

2: https://www.thoughtco.com/sea-nettle-facts-4782495

Standard clauses 1.3.2.2

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

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

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

Evidence

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

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

References

Links	
MarinTrust Standard clause	1.3.2.2, 4.1.4
FAO CCRF	7.5.1
GSSI	D.5.01

FURTHER IMPACTS

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

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

A recent analysis of the outcomes of the scientific observer programme, published in September 2021, provides some additional evidence relating to the potential level of interactions between the anchovy fishery and ETP species; evidence from this report has been included in this section. Additionally, information from the previous report is summarised here for convenience; please refer to the 2021 report itself for more details.

F1.1 Interactions with ETP species are recorded.

Interactions with ETP species must be recorded, a rule which has been supported since 2020 by the introduction of mandatory CCTV coverage of fishing vessels within the Chilean EEZ.

The 2021 re-approval noted potential interactions with Humboldt penguin (*Speniscus humboldti*, IUCN Vulnerable), Peruvian diving petrel (*Pelecanoides garnotii*, IUCN Endangered), Burmeister's porpoise (*Phocoena spinipinnis*), Guanay Cormorant (*Phalacrocorax bougainvilli*, IUCN Near Threatened), green turtle (*Chelonia mydas*, IUCN Endangered) and smooth hammerhead (*Sphyrna zygaena*, IUCN Vulnerable). A subsequent report detailing the findings of the scientific observer programme provides additional detail on potential ETP interactions with the fishery (IFOP, 2021). The table below shows the capture and mortality rates for bird, turtle, and marine mammal species in observed fishing sets of the anchovy purse seine fishery between 2017 and 2020. The data indicates for the species listed above that on average there were:

- 0.003 captures and 0.0003 mortalities of Humboldt penguins per fishing set.
- No captures or mortalities of Peruvian diving petrel.
- No captures or mortalities of Burmeister's porpoise.
- 0.13 captures and 0.13 mortalities of Guanay cormorant per fishing set.
- 0.001 captures and 0 mortalities of green turtles per fishing set.
- Shark bycatch is considered in a different section of the report, which indicated no captures or mortalities of smooth hammerhead.

The species with the highest rates of mortality were fardela negra (sooty shearwater, *Ardenna grisea*, IUCN Near Threatened, 0.12 mortalities per fishing set) and cormorant Guanay (Guanay cormorant, *Phalacrocorax bouganvilli*, IUCN Near Threatened, 0.13 mortalities per fishing set). The species with the highest rate of capture was the lobo marino comun (South American sealion, *Otaria flavescens*, IUCN Least Concern), which had 1.33 captures per fishing set. However, the vast majority were released alive and the mortality rate was 0.003 per fishing set.

The IFOP report also includes a discussion of the self-reported ETP interactions, noting that between 2017 and 2020 the northern anchovy fleet returned 23,417 forms, of which 4,128 included records of bird, mammal or turtle bycatch. This bycatch totalled 23,343 individuals, of which 82% were mammals, 17% seabirds and 1% turtles. Incidental mortality was 5.6% of the total number of captured animals, of which 88% were birds, primarily shearwaters (IFOP, 2021).

Nombre común	Nombre Científico	Captura	Muertos	Mort (%)	CIP	CV_{CIP}	MIP	CV_{MIP}
Lobo marino común	*Otaria flavescens*	4.468	9	0,20	1,33	354	0,003	1,927
Fardela negra	*Ardenna grisea*	568	390	68,7	0,17	3.204	0,12	3,147
Cormorán guanay	*Phalacrocorax bouganvilli*	452	420	92,9	0,13	3.763	0,13	4,020
Delfín común	*Delphinus delphis*	71	23	32,4	0,02	2.084	0,007	2,345
Piquero	*Sula variegata*	68	58	85,3	0,02	2.054	0,017	2,193
Gaviotín monja	*Larosterna inca*	61	0	0	0,02	5.693	0	-
Delfín oscuro	*Lagenorhynchus obscurus*	56	38	67,9	0,02	2.382	0,011	2,463
Pelicano peruano	*Pelecanus thagus*	29	16	55,2	0,009	2.081	0,005	2,168
Delfín sin identificar	Delphinidae	15	0	0	0,004	5.787	0	-
Pingüino de Humboldt	*Spheniscus humboldti*	10	1	10	0,003	2.453	0,0003	5,787
Fardela blanca	*Ardenna creatopus*	8	8	100	0,002	5.787	0,002	5,787
Gaviota garuma	*Leucophaeus modestus*	6	6	100	0,002	5.787	0,002	5,787
Delfín nariz de botella	*Tursiops truncatus*	4	4	100	0,001	5.787	0,001	5,787
Cormorán yeco	*Phalacrocorax brasilianus*	4	4	100	0,001	5.787	0,001	5,787
Tortuga verde	*Chelonia mydas*	3	0	0	0,001	3.340	0	-
Tortuga olivácea	*Lepidochelys olivacea*	3	0	0	0,001	5.787	0	-
Gaviota de Franklin	*Larus pipixcan*	2	2	100	0,001	5.787	0,0006	5,787
Tortuga laúd	*Dermochelys coriacea*	2	0	0	0,001	4.092	0	-
Albatros de ceja negra	*Thalassarche melanophris*	1	1	100	0,0003	5.787	0,0003	5,787
Tortuga cabezona	*Caretta caretta*	1	0	0	0,0003	5.787	0	-
Lobo fino austral	*Arctocephalus australis*	1	0	0	0,0003	5.787	0	-

Catch and incidental mortality of species in the Anchovy industrial purse seine fishery in the North Zone (i.e., Regions XV-II). From scientific observation of 3,350 commercial fishing sets between 2017 and 2020. "Captura" indicates the number of individuals captured during observed sets. "Muertos" indicates the number of observed mortalities. "Mort (%)" indicates the proportion of captured individuals which were killed. "CIP" is the average number of individuals caught per fishing set. "CV_{CIP}" is Average Bycatch Variation Coefficient. "MIP" is the average number of individuals killed per fishing set. "CV_{MIP}" is the Incidental Mortality Rate Variation Coefficient. Table taken from IFOP, 2021, p.184.

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

The 2021 re-approval concluded that there was no substantial evidence that the fishery has a significant negative effect on ETP species. No new evidence was encountered during this surveillance assessment to change this conclusion. Additionally, the 2021 IFP report discussed in detail above indicates that the frequency of interactions between the pelagic fishery and ETP species is negligible.

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

Although interactions with ETP species are thought to be infrequent, several measures are in place to minimise mortality. These include the implementation of a software platform for the registry of incidental fishing mortality by industrial fleets; on-board protocols for the treatment and release of ETP captures; training programmes covering these protocols and other aspects of bycatch minimisation for crews; and increased coverage of on-board observers.

References

IFOP (2021). FINAL REPORT: Performance of the catch and discard research and monitoring programme for bycatch in pelagic fisheries, 2020-2021. Published September 2021. https://www.ifop.cl/wp-content/contenidos/uploads/RepositorioIfop/InformeFinal/2021/P-581168.pdf

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.	PASS
F2.2	There is no substantial evidence that the fishery has a significant negative impact on physical habitats.	PASS
F2.3	If the fishery is known to interact with physical habitats, there are measures in place to minimise and mitigate negative impacts.	PASS
	Clause outcome:	PASS

As at the time of the 2021 re-approval assessment, the purse seine gears used in this fishery continue to be thought to have minimal impact on physical habitats. The information from the previous report is summarised here for convenience; please refer to the 2021 report itself for more details.

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

Purse seine gears are thought to rarely interact with marine habitats; however, in general terms, the potential impact of fisheries on the seabed are considered in the Chilean fishery management process. Chile has established a large area of MPAs, whose effectiveness is monitored by the CCT-PP. Areas are defined using VMS data and take into account survey data, observer programme findings, and fishery-dependent information.

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

Purse seine gears are generally considered to have minimal impact on physical habitats, if any. No evidence was encountered during this surveillance assessment to indicate that the Chilean anchovy fishery differs in this regard.

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

The gears used in the fishery are known not to interact with seabed habitats. Despite this, there are mechanisms in place by which sensitive habitats can be protected if required, in particular, the MPAs described above.

References

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.	PASS
F3.2	There is no substantial evidence that the fishery has a significant negative impact on the marine ecosystem.	PASS
F3.3	If one or more of the species identified during species categorisation plays a key role in the marine ecosystem, additional precaution is included in recommendations relating to the total permissible fishery removals.	PASS
	Clause outcome:	PASS

There have been no substantial changes in the aspects of the fishery which relate to Section F3 since the time of the 2021 re-approval. The information from the previous report is summarised here for convenience; please refer to the 2021 report itself for more details.

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

Ecosystem components are considered during the decision-making process. Annual closures occur to protect the anchovy spawning-stock biomass and juveniles. Closure locations depend on monitoring of the stock size and other biological indicators. A five-mile artisanal-exclusive zone provides protection for spawners and other species. Additionally, environmental factors have a strong influence over recruitment and other aspects of stock management, and are considered extensively during the stock assessment process.

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

The 2021 re-assessment concluded that at the time it was completed there was no substantial evidence that the fishery had a significant negative impact on marine ecosystems, and no new evidence has been encountered during the completion of this surveillance assessment.

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.

Anchovy is a low trophic level species and is an important prey species for many predators. Ecosystem modelling attempts to understand the needs to predator species and is factored in to quota recommendations. The LGPA introduced a requirement to implement an ecosystem-based approach to fisheries management, and while there remain challenges to fully implementing this approach, the stock assessment models currently used already incorporates ecosystem and predator considerations.

References

Presencia e interacción del ensamble de aves marinas durante faenas de pesca industrial de cerco de anchoveta (Engraulis ringens) en la zona norte de Chile Centro de Investigación Aplicada del Mar S.A., CIAM Septiembre 2019.

Status of the principle Chilean fisheries, 2021. SUBPESCA. https://www.subpesca.cl/portal/618/articles-114817_recurso_1.pdf

Links	
MarinTrust Standard clause	1.3.3.3
FAO CCRF	7.2.2 (d)
GSSI	D.2.09, D3.10, D.6.09

SOCIAL CRITERION

In addition to the scored criteria listed above, applicants must commit to ensuring that vessels operating in the fishery adhere to internationally recognised guidance on human rights. They must also commit to ensuring there is no use of enforced or unpaid labour in the fleet(s) operating upon the resource.

Appendix A - Determining Resilience Ratings

The assessment of Category B species described in this assessment report template utilises a resilience rating system suggested by the American Fisheries Society. This approach was chosen because it is also used by FishBase, and so the resilience ratings for many thousands of species are freely available online. As described by FishBase, the following is the process used to arrive at the resilience ratings:

"*The American Fisheries Society (AFS) has suggested values for several biological parameters that allow classification of a fish population or species into categories of high, medium, low and very low resilience or productivity (Musick 1999). If no reliable estimate of r_m (see below) is available, the assignment is to the lowest category for which any of the available parameters fits. For each of these categories, AFS has suggested thresholds for decline over the longer of 10 years or three generations. If an observed decline measured in biomass or numbers of mature individuals exceeds the indicated threshold value, the population or species is considered vulnerable to extinction unless explicitly shown otherwise. If one sex strongly limits the reproductive capacity of the species or population, then only the decline in the limiting sex should be considered. We decided to restrict the automatic assignment of resilience categories in the Key Facts page to values of K, t_m and t_{max} and those records of fecundity estimates that referred to minimum number of eggs or pups per female per year, assuming that these were equivalent to average fecundity at first maturity (Musick 1999). Note that many small fishes may spawn several times per year (we exclude these for the time being) and large live bearers such as the coelacanth may have gestation periods of more than one year (we corrected fecundity estimates for those cases reported in the literature). Also, we excluded resilience estimates based on r_m (see below) as we are not yet confident with the reliability of the current method for estimating rm. If users have independent r_m or fecundity estimates, they can refer to Table 1 for using this information*."

Parameter	High	Medium	Low	Very low
Threshold	0.99	0.95	0.85	0.70
r_{max} (1/year)	> 0.5	0.16 - 0.50	0.05 - 0.15	< 0.05
K (1/year)	> 0.3	0.16 - 0.30	0.05 - 0.15	< 0.05
Fecundity (1/year)	> 10,000	100 - 1000	10 - 100	< 10
t_m (years)	< 1	2 - 4	5 - 10	> 10
t_{max} (years)	1 - 3	4 - 10	11 - 30	> 30

[Taken from the FishBase manual, "Estimation of Life-History Key Facts", http://www.fishbase.us/manual/English/key%20facts.htm#resilience]

Glossary

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

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

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, Chile Zones XV-IV
Management authority (Country/State)	Chile – SUBPESCA & SERNAPESCA
Main species	Anchovy (*Engraulis ringens*)
Fishery location	Chile, Zones XV-IV
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 assessors have provided a detailed examination of the fishery with appropriate levels of evidence and which follows the standards required. Use of logbooks and cameras has increased data on interactions with ETP species. It is good to see new evidence from observers has become available, especially in relation to by-catch species and that this information has been considered within this review.
General Comments on the Draft Report provided to the peer reviewer

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?	✓		
2. Does the Species Categorisation section of the report reflect the best current understanding of the catch composition of the fishery?	✓		
3. Are the scores in the following sections accurate (i.e. do the scores reflect the evidence provided)?	✓		
Section M - Management	✓		
Category A Species	✓		
Category B Species	N/A		
Category C Species	✓		
Category D Species	✓		
Section F – Further Impacts	✓		

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?
For all sections the scoring is consistent with the MT standard and the appropriate evidence is provided within the assessment report.
Certification body response
n/a

2. Has the fishery assessment been fully completed, using the recognised MARINTRUST fishery assessment methodology and associated guidance?
The fishery assessment has been fully completed following the MARINTRUST methodology and notwithstanding the remarks in this peer review report (see specific sections below). An internal review of the assessment has been conducted and agrees with the findings of the assessment
Certification body response
n/a

3. Does the Species Categorisation section of the report reflect the best current understanding of the catch composition of the fishery?
The species categorisation section (see Table 5) indicates the catch composition is made up of >95% Anchovy (*Engraulis ringens*) and 1.6% Jack mackerel (*Trachurus murphyi*) and takes into account new observer data. This reflects the best current understanding of the catch composition of the fishery. Note the two anchovy stocks should be labelled as Category A not C in Table 5. Helpful figures provided by the assessor. It would be useful to present details of the temporal coverage of the observer data in comparison to the full fishing period to indicate how representative of the full fishing period the observer coverage is.
Certification body response
The categorisation error has been corrected. A note has been added to the species categorisation rationale to indicate the temporal coverage of the observer data.

3M. Are the scores in "Section M – Management" clearly justified?	
The scores in this section are clearly justified by the assessor. Comments: In section M1.1 can you clarify if there any evidence the management authority is involved in training? M1.5 Can the assessor provide evidence that the management system includes for the engagement of relevant non-governmental organisations, such as fishing industry representatives or environmental NGOs. And are there relevant examples of recent consultations? M2.2 Is there any evidence of sanctions being applied? M2.3 Do fishers provide additional information to managers to support the effective management of the fishery? E.g reporting suspected illegal activity?	
Certification body response	

As a surveillance assessment, this report focuses on changes to the management system since the previous MT assessment. Additional detail in the areas listed above will be included in the next full re-assessment. Please note also that some of the questions above are answered by the original full fishery assessment.

3A. Are the "Category A Species" scores clearly justified?
The scores in this section are clearly justified by the assessor with useful figures presented. Fishing mortality is restricted through the implementation of an annual quota, based on scientific advice and for 2022 the landings were equal to the TAC. The stocks were estimated in their most recent stock assessments to have biomass levels above the target and limit reference points. Management includes temporary closures to protect juveniles and spawning aggregations, with closures lasting a minimum of one week.
Certification body response
n/a

3B. Are the "Category B Species" scores clearly justified?
No Category B species were identified.
Certification body response
n/a

3C. Are the "Category C Species" scores clearly justified?
The scores in this section are justified by the assessor, with suitable evidence provided. Jack mackerel by-catch was small in comparison to the total international landings levels.
Certification body response
n/a

3D. Are the "Category D Species" scores clearly justified?
The scores in this section are justified by the assessor, with suitable evidence provided.

Certification body response
n/a

3F. Are the scores in "Section F – Further Impacts" clearly justified?
The scores in this section are justified by the assessor, with information from the 2021 observer data provided. Comments For the ETP species recorded as bycatch could information regarding population trends of the species also be provided? Are there any measures in place to minimise mortality of the ETP species it terms of escape panels in nets/cleaning nets between hauls? Mullet sharks were reported in observer data to have been captured and discarded in the fishery within the observer data, and while the capture levels were small it would be useful to examine if there were temporal or seasonal increases in shark by-catch.
Certification body response
No new information on ETP population trends was present in the observer report; however, in the next full MT assessment this information should be sought out. There is no new evidence of measures in place to mitigate ETP mortality, beyond those mentioned in the report. There was no indication of temporal or seasonal patterns in the shark bycatch in the observer report; however this area should be a focus of the next full re-assessment of the fishery.

Optional: General comments on the Peer Review Draft Report
The fishery review by the assessor provides a good level of detail and useful references and updates since the 2021 assessment.
Certification body response
n/a