



MarinTrust Standard V2

Whole fish Fishery Assessment *Chilean anchovy (Engraulis ringens)* *and Araucanian herring (Strangomera bentincki)*

FAO 87, Chilean EEZ Regions V-X

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): Alimentos Pesqueros SPA, Arica Sur, Coquimbo, Coronel, Corral, FoodCorp Chile, Glaciares SA, Graneros SA, Industrias Isla Quihua SA, Iquique, Lota, Mejillones, Pesquera Fiordo Austral S.A, Salmonoil SA, San Vicente, Sociedad Pesquera Landes SA, Alimar Industrias Isla Quihua, Blumar S.A. San Vicente/Corral, Camanchaca Pesca Sur S.A, Compañia Pesquera Camanchaca S.A, Corpesca (Iquique Oriente, Mejillones/Arica Sur/Arica Norte/Iquique Sur), Fiordo Austral, Glaciares/Graneros S. A, FoodCorp Chile S.A, Lota Protein S.A, Orizon S.A (Coquimbo/Coronel Sur).			
Country: Chile			
Email address:		Applicant Code	
Certification Body Details			
Name of Certification Body:		Global Trust Certification Ltd. / NSF	
Assessor Name	CB Peer Reviewer	Assessment Days	Initial/Surveillance/ Re-approval
Ana Elisa Almeida Ayres	Matthew Jew	2	Surveillance 1
Assessment Period	July 2023		
Scope Details			
Management Authority (Country/State)		Chile Undersecretary for Fisheries and Aquaculture (SUBPESCA)	
Main Species		Anchovy (<i>Engraulis ringens</i>) Araucanian herring (<i>Strangomera bentincki</i>) mote sculpin (<i>Normanichthys crockeri</i>)	
Fishery Location		FAO 87 Pacific Southeast, Chile EEZ, Regions V to X	
Gear Type(s)		Purse seine	
Outcome of Assessment			
Overall Outcome		Pass	
Clauses Failed		None	
CB Peer Review Evaluation		Agree with assessor's recommendation	
Fishery Assessment Peer Review Group Evaluation		Approved (subject to comments being addressed – see PR comments and GTC response in Appendix B)	
Recommendation		APPROVED	

Table 2. Assessment Determination

Assessment Determination
<p>Pelagic purse seine fishery in the south-central zone of Chile (Valparaíso to Los Lagos Region), which corresponds to regions V-X of Chilean Exclusive Economic Zone (EEZ), operates on <i>Engraulis ringens</i> - anchovy ("<i>anchoveta</i>", in Spanish) and <i>Strangomera bentincki</i> - Araucanian herring ("<i>sardina común</i>", in Spanish) in coastal areas. In the south-central zone of Chile, seafood processing plants are supplied mainly by anchovy and Araucanian herring from artisanal fisheries operating in Biobío Region. The third most caught species in the catch is anchovy and Araucanian herring artisanal fishery is <i>Normanichthys crockeri</i> - mote sculpin ("<i>bacadillo</i>" or "<i>mote</i>", in Spanish). Thus, this assessment was based on data of anchovy, Araucanian herring and mote sculpin artisanal fishery.</p>
<p>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, the three species are eligible for approval for use as Marin Trust whole fish raw material.</p>
<p>The Undersecretariat of Fisheries and Aquaculture ("<i>Subsecretaría de Pesca y Acuicultura</i>", in Spanish) – SUBPESCA is a public institution that belongs to Ministry of Economy, Development, and Tourism ("<i>Ministerio de Economía, Fomento y Turismo</i>", in Spanish) - MINECON and provides policy settings and regulatory framework. The National Fisheries and Aquaculture Service ("<i>Servicio Nacional de Pesca y Acuicultura</i>", in Spanish) - SERNAPESCA is a public institution that belongs to MINECON and is responsible for executing fisheries policy through enforcement. The Fisheries Development Institute ("<i>Instituto de Fomento Pesquero</i>", in Spanish) – IFOP is a non-profit private-law and the research arm of the institutional framework and the primary source of scientific advice to SUBPESCA. The Scientific and Technical Committee for Small Pelagic fisheries ("<i>Comité Científico Técnico de Pesquerías de Pequeños Pelágicos</i>", in Spanish) - CCT-PP, formed by IFOP and SUBPESCA, analyse updates on stock status and catch projections and make official recommendations to the authorities.</p>
<p>The General Law of Fishing and Aquaculture ("<i>Ley General de Pesca y Acuicultura</i>", in Spanish) - LGPA N° 18.892 issued in 1989 and, in particular, the modifications made under law N° 20.657 of February 9th, 2013, is the current law that these organisations follow to manage the fisheries in Chile.</p>
<p>A management plan for Chilean anchovy and Araucanian herring (Chile V-X) has been officially adopted. The plan sets lines of action to address biological, economic, social, and ecological matters. Fixed and mobile temporal closures to protect spawning stock and juveniles are included. Catches are reported annually. Catch limits are modified in an adaptive way during the year to account for updated scientific data. Direct hydroacoustic surveys (anchovy and Araucanian herring) have been conducted biannually since 1999.</p>
<p>The last publication of CCT-PP [May 2023] reported that the anchovy stock in the central-south zone is maintained for the third year in a state of full exploitation for the biological year 2022/2023 (SSB/SSBMSY=1.39 and F/FMSY=1.00) and the landings were under the Total Allowable Catch – TAC. Regarding Araucanian herring, in 2022 the recruitment suffered a sharp decrease, reaching 49.7% below the average recent recruitment. However, it has been identified an important recovery, with an increase of 87.4% when comparing to 2021. Although this publication pointed that Araucanian herring moved from a state of full exploitation in 2021/22 to over exploitation in 2022/23, reaching a spawning biomass of 15.3% under the SSBMSY; the mortality by fishing is at the FMSY level and the TAC is respected. The organizations involved in fishery management are attentive to stock status and discussing mechanisms to address this situation. CCT-PP has been discussed the need to reduce the Biologically Acceptable Catches - BAC range for 2023, work has been done on the review of the management cycle of the pelagic fishery of central-south Chile and there is a new dynamic and flexible closure mechanism proposed for anchovy and Araucanian herring fishery.</p>

In 2013, the new Fishing and Aquaculture General Act (FAGA) was passed aiming the conservation and sustainable use of fisheries resources through the application of the precautionary approach and the Ecosystem-based Fisheries Management- EBFM.

ETP, habitat and ecosystems are not significantly impacted by this fishery. Although one of the ETP species affected by purse seine, pink-footed shearwaters - *Ardenna creatopus* ("fardela blanca", in Spanish), is considered vulnerable, there are several additional at-sea threats and no evidence that this fishery is having a great impact in its status of vulnerability. In March 2022, Chile published a "Plan for the recovery, conservation and management of the pink-footed shearwater (*Ardenna creatopus*)".

Mote sculpin landings in Chile have increased in recent years. There is a record of its size, catch, and discard, and regulations governing its catch. However, because this species is not commercially important, it has been the subject of little research. Therefore, we assumed that the productivity attributes of mote sculpin are similar to those of other small pelagic fishes in the region, such as anchovy and Araucanian herring. We filled in the missing information for mote sculpin with data from anchovy and Araucanian herring.

The assessor recommends the approval of Chilean anchovy V-X *Engraulis ringens* whole-fish (Category A), Araucanian herring *Strangomera bentincki* whole-fish (Category A), and mote sculpin *Normanichthys crockeri* (Category D) for the production of fishmeal and/or fish oil under the current Marin Trust Whole fish and by-product Standard (v 2.2).

Fishery Assessment Peer Review Comments

The assessors have provided a detailed examination of the fishery with appropriate levels of evidence, and which follows the standards required.

*Several comments are made throughout [...the peer review document. Attached in appendix B] referring to evidence which may be supportive in substantiating the assessment outcome.

- M2.4: By catch reduction methods
- M2.4 Evidence of the outcome of control programs for 2022 – no. of sanctions and in what areas of non-compliance
- 3A(A.3.3) Comment referring to 2024 surveillance
- Table D: A note to clarify the Fecundity score of 2 and not 1.
- 3F.(F1.3) Any further evidence to substantiate specific measures to mitigate interactions with the vulnerable and near threatened bird species encountered.
- F3.3. Note to reference the role of ecosystems-based fishery management in establishing BAC's.
- General Comments on the Draft Report provided to the peer reviewer.

The peer reviewer has commented in several places referring to evidence contained in figures and tables which is helpful for easy referencing the data.

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

Category	Species	% landings	Outcome (Pass/Fail)	
Category A	Anchovy (<i>Engraulis ringens</i>)	48%	A1	Pass
			A2	Pass
			A3	Pass
			A4	Pass
Category B	Araucanian herring (<i>Strangomera bentincki</i>)	50%	A1	Pass
			A2	Pass
			A3	Pass
			A4	Pass
Category D	Mote sculpin (<i>Normanichthys crockeri</i>)	2%	D1	Pass
			D2	Pass
			D3	Pass
			D4	Pass

Table 5 Species Categorisation Table

Common name	Latin name	Stock	IUCN Redlist Category ¹	% of landings	Management	Category
Anchovy ("anchoveta", in Spanish)	<i>Engraulis ringens</i>	FAO 87 Pacific Southeast Chile EEZ Regions V to X	Least concern	48%	SUBPESCA	A
Araucanian herring ("sardina común", in Spanish)	<i>Strangomera bentincki</i>	FAO 87 Pacific Southeast Chile EEZ Regions V to X	Least concern	50%	SUBPESCA	A
Mote sculpin ("bacadillo" or "mote", in Spanish)	<i>Normanichthys crockeri</i>	FAO 87 Pacific Southeast Chile EEZ Regions V to X	Not evaluated	2%	No	D

Species categorisation rationale

Pelagic purse seine fishery in the south-central zone of Chile (Valparaíso Region to Los Lagos Region), which corresponds to regions V-X of Chilean Exclusive Economic Zone (EEZ), operates on *Engraulis ringens*- anchovy ("anchovy", in Spanish) and *Strangomera bentincki* - Araucanian herring ("sardina común", in Spanish) in coastal areas.

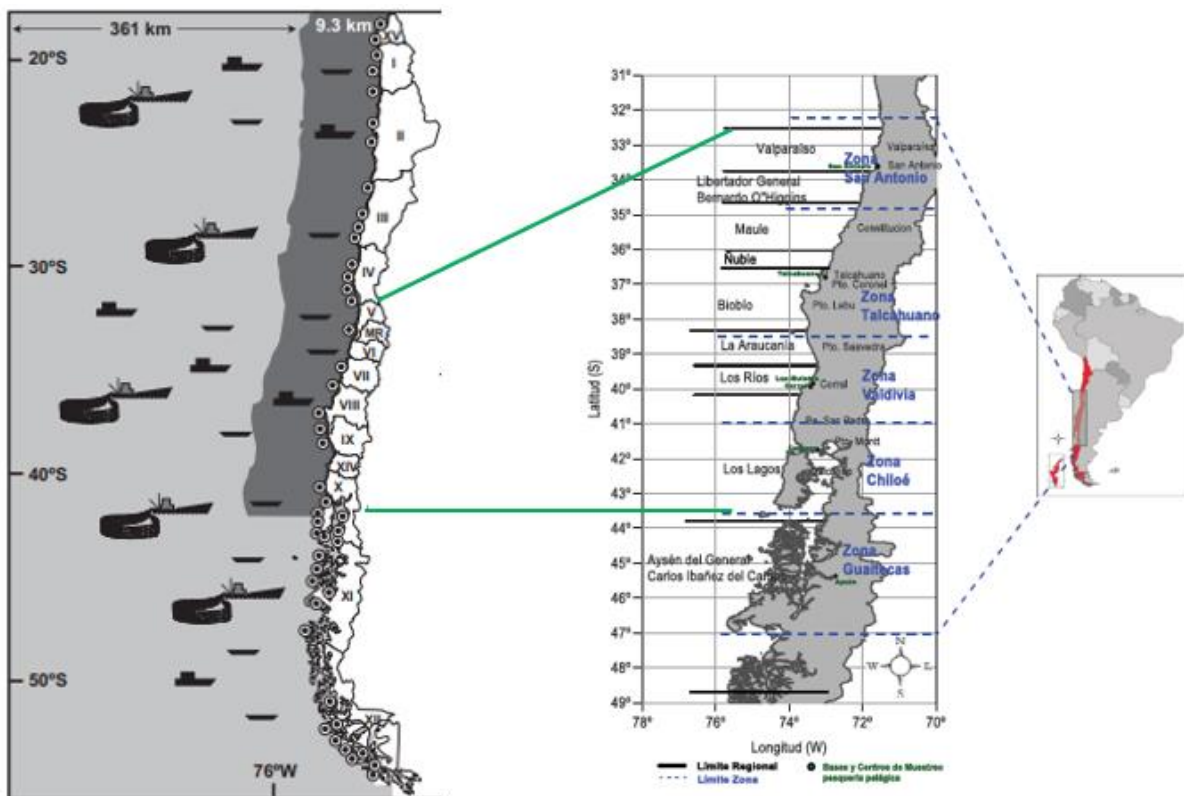


Figure 1. Adapted maps of Chile showing the numerical administrative zones (left) [Gelcich et al., 2010] and the names of the zones (right) [IFOP¹, 2022a]. The green lines indicate the location of the south-central stock of anchovy and Araucanian herring of this assessment.

¹ <https://www.iucnredlist.org/>

In the south-central zone of Chile, seafood processing plants are supplied mainly by anchovy and Araucarian herring from artisanal fisheries operating in Biobío Region (Oceana, 2020). Data of landings from 2018-2022 corroborated this fact (SERNAPESCA, 2023).

AÑO	ANCHOVETA		SARDINA COMÚN	
	ARTESANAL	INDUSTRIA	ARTESANAL	INDUSTRIA
2009	241.491	154.418	219.151	493.868
2010	121.651	74.088	392.866	161.278
2011	85.028	12.273	580.744	179.006
2012	56.785	13.252	492.210	189.295
2013	29.260	5.180	121.402	47.534
2014	47.662	4.495	355.228	70.655
2015	56.478	3.837	280.198	70.770
2016	60.159	4.946	104.533	81.120
2017	46.192	3.184	252.629	22.110

Figure 2. Landings of anchovy and Araucarian herring in the period of 2009-2017 in Biobío Region (Oceana, 2020).

Year	Anchovy		Araucarian herring	
	Artisanal	Industrial	Artisanal	Industrial
2018	60,753	1,396	335,296	10,133
2019	157,443	663	31,6605	3,542
2020	167,31	1,794	256,316	7,537
2021	175,2	0	344,115	0
2022	217,873	935	218,488	5,447

Figure 3. Landings of anchovy and Araucarian herring in the period of 2018-2022 in regions V-X of Chilean Exclusive Economic Zone - EEZ (SERNAPESCA, 2023).

According to OCEANA (2020), IFOP (2020), IFOP (2021) and IFOP² (2022b), during 2015-2019, in 2020 and in 2021, the third most caught species in the catch in anchovy and Araucarian herring artisanal fishery was *Normanichthys crockeri*, known as mote sculpin (“bacadillo” or *mote*”, in Spanish).

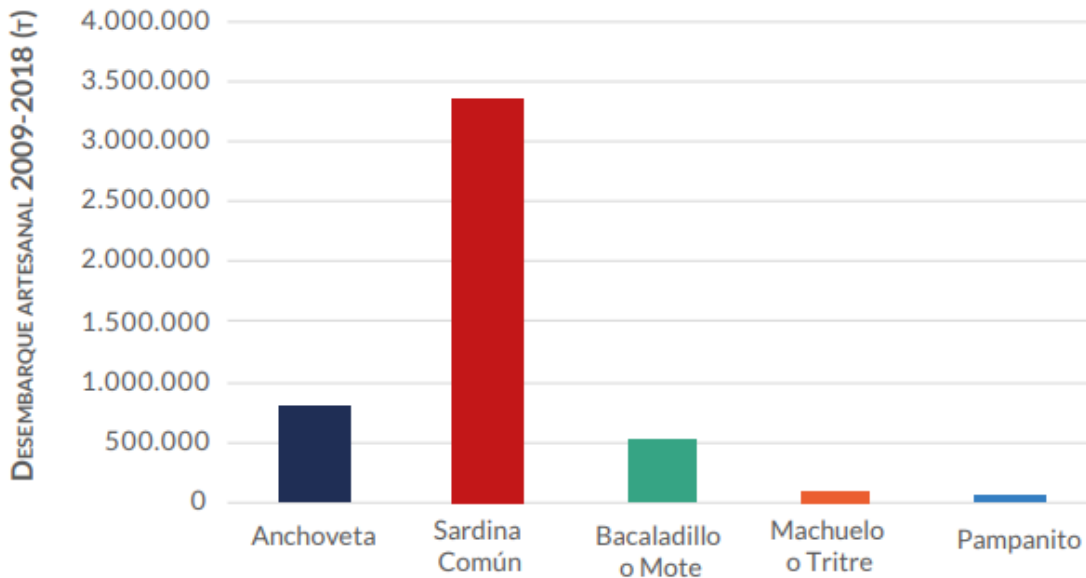


Figure 4. Total contribution per resource to the landings of the pelagic artisanal fleet of the Biobío region during 2009-2018 period (Oceana, 2020).

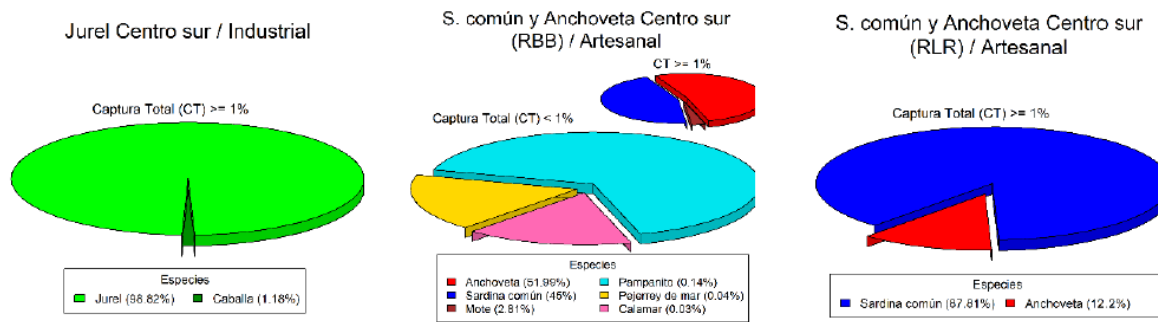


Figure 5. Proportion of species estimated in the fisheries of the south-central zone during the year 2021 (observer data). CT: total catch, RBB: Biobío region and RLR: Los Ríos region. In parentheses is the percentage that the species represented in the total catch of the fishery (IFOP², 2022b).

The species categorisation rationale in this section is based on catches from anchovy and Araucanian herring artisanal fisheries obtained on the report “Programa de investigación y monitoreo del descarte y la captura de pesca incidental en pesquerías pelágicas, 2021-2022” – IFOP (2022^{2b}), published in November 2022, which is the most updated report of this kind. The data for this report was provided by scientific observers working in commercial expeditions performed in 2021 and information from observers of projects of pelagic discards and pelagic fisheries monitoring.

IFOP¹ (2022a) pointed that due COVID-19, the anchovy and Araucanian herring industrial fisheries had practically no fishing operation in 2021 and orientated its activity exclusively for the capture of horse mackerel, which is usually caught in oceanic and international waters. Within the south-central zone of Chile, in 2021, there were expeditions with observers in artisanal fleets operating on anchovy and Araucanian herring fishery in coastal areas close to Biobío and Los Ríos.

In the Biobío Region, the catch of six species in 2021 was recorded in 40 set hauls: anchovy (~52%), Araucanian herring (45%), mote sculpin (~3%), starry butterflyfish (~0.1%, “pampanito”, in Spanish), Chilean silverside (0.04%, “Pejerrey de mar”, in Spanish) and squid (0.03%, “calamar”, in Spanish). For anchovy, a total catch of 192,880 t was estimated with a discard equivalent to 10.4% (20,072 t). For Araucanian herring, the estimated total catch was 166,955 t with 1.1% of the discarded catch (1,869 t). For mote sculpin, a total catch of 10,41 t was estimated with zero discard.

In Los Ríos Region, there were only 2 set hauls with catches and only the target species were captured. Araucanian herring represented ~87.8% (40,698 t) of the estimated total catch, while anchovy, 12,2% (5,652 t).

Considering an average of the total catches between these two regions (Biobío and Los Ríos), it was defined for this assessment landings of 48% for anchovy, 50% for Araucanian herring and 2% for mote sculpin.

References

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.pnas.org/doi/10.1073/pnas.1012021107>

IFOP. 2020. Programa de observadores científicos: Programa de investigación y monitoreo del descarte y la captura de pesca incidental en pesquerías pelágicas, 2019-2020. Convenio de Desempeño 2019. Instituto de Fomento Pesquero, Valparaíso. <https://www.ifop.cl/wp-content/contenidos/uploads/RepositorioIfop/InformeFinal/2020/P-581156.pdf>

IFOP. 2021. Programa de investigación y monitoreo del descarte y la captura de pesca incidental en pesquerías pelágicas, 2020-2021. Informe Final. Convenio de Desempeño 2020. Instituto de Fomento Pesquero, Valparaíso. <https://www.ifop.cl/wp-content/contenidos/uploads/RepositorioIfop/InformeFinal/2021/P-581168.pdf>

IFOP¹. 2022a. Estatus y posibilidades de explotación biológicamente sustentables de los recursos anchovy, Regiones Valparaíso – Los Lagos, 2022. Primer Informe. Convenio de Desempeño 2020, Instituto de Fomento Pesquero, Valparaíso. https://www.ifop.cl/wp-content/contenidos/uploads/RepositorioIfop/InformeFinal/2022/P-483259_sardinacomun.pdf

IFOP². 2022b. Programa de observadores científicos: Programa de investigación y monitoreo del descarte y de la captura de pesca incidental en pesquerías pelágicas, año 2021-2022. INFORME FINAL. Convenio de Desempeño 2021. https://www.ifop.cl/wp-content/contenidos/uploads/RepositorioIfop/InformeFinal/2022/P-581180_mejorado.pdf

OCEANA. 2020. Estudio Brechas de Control en el Desembarque y Procesamiento de anchoveta y Sardina Común en la Región del Biobío. Informe Final. https://chile.oceana.org/wp-content/uploads/sites/19/informe_sardininas.pdf

SERNAPESCA. 2023. Anuario Estadístico de Pesca y Acuicultura. Chile. Desembarque total por especie y región. <http://www.sernapesca.cl/informacion-utilidad/anuarios-estadisticos-de-pesca-y-acuicultura>

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
<p>M1.1 There is an organisation responsible for managing the fishery.</p> <p>Ministry of Economy, Development, and Tourism (“<i>Ministerio de Economía, Fomento y Turismo</i>”, in Spanish) - MINECON is the organism involved in promoting the development of the fisheries sector, along with the protection, conservation, and full use of resources and the marine environment.</p> <p>Chile’s institutional structure involves governing the fisheries sector centres around three key organisations, with several other institutions providing additional research and enforcement:</p> <ul style="list-style-type: none"> ▪ The Undersecretariat of Fisheries and Aquaculture (“<i>Subsecretaría de Pesca y Acuicultura</i>”, in Spanish) – SUBPESCA is a public institution that belongs to MINECON and provides policy settings and regulatory framework. ▪ The National Fisheries and Aquaculture Service (“<i>Servicio Nacional de Pesca y Acuicultura</i>”, in Spanish) - SERNAPESCA is a public institution that belongs to MINECON and is responsible for executing fisheries policy through enforcement. ▪ The Fisheries Development Institute (“<i>Instituto de Fomento Pesquero</i>”, in Spanish) – IFOP is non-profit private-law and the research arm of the institutional framework and the primary source of scientific advice to SUBPESCA. <p>The General Law of Fishing and Aquaculture (“<i>Ley General de Pesca y Acuicultura</i>”, in Spanish) - LGPA N° 18.892 issued in 1989 and, in particular, the modifications made under law N° 20.657 of February 9th, 2013, is the current law that these organisations follow to manage the fisheries in Chile.</p> <p>There is an organisation responsible for managing the fishery. Sub-clause M1.1 is met.</p> <p>M1.2 There is an organisation responsible for collecting data and assessing the fishery.</p> <p>The Fisheries Development Institute (“<i>Instituto de Fomento Pesquero</i>”, in Spanish) – IFOP is the organization responsible for sampling stocks and carrying out annual acoustic surveys. IFOP is a non-profit organisation created in 1964 under a joint agreement between the Chilean government, Food and Agriculture Organization- FAO, and the United Nations Development Programme - UNDP. IFOP’S public role is to support sustainable development of Chile’s fishing sector.</p> <p>A Scientific and Technical Committee for Small Pelagic fisheries (“<i>Comité Científico Técnico de Pesquerías de Pequeños Pelágicos</i>”, in Spanish) - CCT-PP, formed by IFOP and SUBPESCA, analyse updates on stock status and catch projections and make official recommendations to the authorities.</p> <p>There are organizations responsible for collecting data and assessing the fishery. Sub-clause M1.2 is met.</p> <p>M1.3 Fishery management organisations are publicly committed to sustainability.</p> <p>SUBPESCA states that their institutional mission is to “Regulate and manage fishing and aquaculture activities, through policies, standards and management measures, under a precautionary and ecosystem approach that</p>			

promotes the conservation and sustainability of hydrobiological resources for the productive development of the sector” (SUBPESCA¹, 2023a).

According to SUBPESCA² (2023b), SERNAPESCA “Oversees compliance with fisheries and aquaculture regulations, provides services to facilitate its appropriate implementation and to conduct an effective sanitary management, in order to contribute to the sector's sustainability and the protection of the hydrobiological resources and their environment” and IFOP is “Non-profit private-law body aimed at supporting the sustainable development of the fisheries and aquaculture sector of the country.”

As laid down in the LGPA (see M1.4) one of the main objectives of this Law is “conservation and sustainable use of hydrobiological resources, through the application of the precautionary approach, of an ecosystemic approach in the fishing regulation and the safeguard of the marine ecosystems in which these resources exist”.

IFOP conducts regular scientific assessments of the anchovy and Araucanian herring stock. Based on the stock assessment reports, recommendations from technical committees, and stakeholder input, the SUBPESCA establishes annual quotas. Quotas are set to maintain sustainable levels of fishing, taking into consideration the reproductive capacity of the stocks and the need for their long-term conservation. SERNAPESCA monitors fishing activities and enforces compliance with the established quotas to ensure the sustainable management of these fisheries resources.

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

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

Created in 1976 and adopted for this fishery in 2013, the primary legal instrument for fisheries management in Chile has been The General Law of Fishing and Aquaculture (“*Ley General de Pesca y Acuicultura*”, in Spanish) - LGPA N° 18.892. The LGPA is a modification of the previous fisheries legislation, and includes:

- Commitments convened to manage the sustainable use and conservation of marine resources
- Commitments convened to make key decisions on conservation measures based on scientific information above all other considerations.
- Recommendations of CCT-PP have been made mandatory for all stakeholders.

The LGPA also includes commitments to develop management plans for any fishery with restricted access, and to review and update these plans every five years. Article 5 of the LGPA states that SUBPESCA should determine Biological Reference Points (BRP’s) for all targeted stocks. Biologically Acceptable Catches (BAC’s) and resource recovery plans are implemented under Article 9.

SUBPESCA resolution N° 291/2015 states that all stocks should be exploited around the Maximum Sustainable Yield - MSY level and that the MSY is the target to be considered when quotas are established.

Fishery management organisations are legally empowered to take management actions. Sub-clause M1.4 is met.

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

A National Fisheries Council (“*Consejo Nacional de Pesca*”, in Spanish) - CNP created by LGPA No. 18.892, ensures the participation of all stakeholders in the fisheries and aquaculture sector. It is a decisive, advisory and consultative body concerning the subjects established by the law. Its properly based opinions, recommendations, proposals, and technical reports are submitted to SUBPESCA on all those subjects stated by the law as well as any other of interest to the sector (SUBPESCA², 2023b).

For fisheries management, SUBPESCA has two advisory bodies: Management Committee and CCT – PP.

Anchovy and Araucanian herring fishery has a Management Plan and a Management Committee, which is an Advisory/Consultative body of the fishing authority that includes the main stakeholders of each fishery as well as officials from SUBPESCA and from SERNAPESCA (SUBPESCA², 2023b).

CCT-PP, formed by IFOP and SUBPESCA, analyse updates on stock status and catch projections and make official recommendations to the authorities.

The determination of quotas for the anchovy and Araucanian herring stock in Chile involves a collaborative approach that combines scientific assessments, expert recommendations, stakeholder consultations, and regulatory enforcement to ensure the sustainable management of these fisheries resources.

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

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

CNP, the Management Committee and CCT-PP have regular meetings and minutes of these meetings are published on the relevant sections of websites SUBPESCA website (SUBPESCA³, 2023c).

The status of the main Chilean fisheries is published annually in SUBPESCA website (SUBPESCA⁴, 2023d). Should more details be needed they can be obtained under request.

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

References

SUBPESCA¹. 2023a. SUBPESCA website. Section “Acerca de la Subsecretaría”. <https://www.SUBPESCA.cl/portal/616/w3-propertyvalue-538.html>

SUBPESCA². 2023b. SUBPESCA Website. Section “General Aspects” <https://www.SUBPESCA.cl/portal/616/w3-article-86168.html>

SUBPESCA³. 2023c. SUBPESCA Website. Section “Institucionalidad” <https://www.SUBPESCA.cl/portal/616/w3-propertyname-539.html>

SUBPESCA⁴. 2023d. SUBPESCA Website. Section “Cuenta pública de estado de recursos” <https://www.SUBPESCA.cl/portal/618/w3-propertyvalue-792.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.	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.

Compliance both within and outside Chile’s EEZ is monitored by a number of different entities:

- SERNAPESCA: Carry out audits of capture fisheries; implement surveillance and control of compliance with all legal provisions relating to fisheries. Health and environmental monitoring of aquaculture. Develop strategies and procedures for prevention, surveillance and control of high-risk diseases. Information and sectoral statistics. Managing fisheries and aquaculture records.
- Chilean Navy: Within Chile’s Exclusive Economic Zone (EEZ) the Navy monitor an area covering approximately 4,542,990 km² ensuring the prevention of depredation of natural resources by protecting the ecosystem from unauthorized activities.
- Observer Programme: There is a plan of reduction of the bycatch of the species that is reviewed periodically and the information is used to establish the limits of additional catches in the fishery.

There is an organisation responsible for monitoring compliance with fishery laws and regulations. Sub-clause 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.

The LGPA defines a range of sanctions for offences including fishing with an unlicensed vessel, illegal discarding, incorrect logbook use, failure to report landings, and fishing in a region or fishery other than the one for which the vessel is licenced. Depending on the offence, sanctions can include one or a combination of: monetary penalties; suspension of fishing licence; and revocation of licence.

There is a framework of sanctions which are applied when laws and regulations are discovered to have been broken. Sub-clause 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.

In 2005, a national action plan was approved with the aim of preventing, deterring, and eliminating IUU fishing. The fishery is monitored and currently, there is no evidence of widespread IUU fishing activities. Chile is now involved in an international program to avoid illegal fishing named "Agreement on Port State Measures". This program obliges landings from other countries to be controlled by Chile and applies to foreign flagged vessels fishing in Chilean waters.

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

SERNAPESCA conduct inspections and implement surveillance measures and control of compliance. Compliance with the management policies adopted proves high, being encouraged by a supervision and control system that has been applied for several years.

The position of the artisanal vessels is monitored daily with a satellite device and this information is compared with landing declarations. Pursuant to article 64 of LGPA, vessels with an overall length equal to or greater than 15 meters, are required to install a satellite device as well as artisanal vessels with a length equal to or greater than 12 meters and the ones with less than 15 meters registered as pelagic fisheries using purse seine.

There is a plan for reduction of the bycatches, authorized by exempt resolution No. 2,463 of 2017, and other resolutions, which included work of scientific observers in commercial expeditions, spatial and temporal closures of fisheries when the incidence of juveniles is high or when it exceeds the limit of accompanying fauna and others.

Mitigation Measures (MM) / Good Practices (BP)	Regulacion	Quantifiable	Enforces	Associated causes
Joint imputation of the catch of anchovy and Araucanian herring between the Regions of Valparaíso to Los Lagos, will amount to a 70% of the sum of effective quotas of the aforementioned resources, in a 1 to 1 ratio, where the composition of the landing corresponds to a mixed fishery, in which Araucanian herring is the dominant species with respect to anchovy. I modify the joint imputation of Araucanian herring and anchovy, of 40% (D.Ex.No.87/2020). (MM)	R.Ex.N°. 2463/2017 R.Pesq.N°. 95/2017 D.Ex.No.87/2020, modifies D.Ex.No.87-2020	No	Yes	2) Exceeding the permitted limit of accompanying fauna 5) Catches of closed species 9) Catches of non-commercial species 14) Exceeds fishing quota or LMCA 17) Without tradable fishing license 18) Cast with little fishing
Establishment of space-time closures based on information in real time when the percentage of juveniles was high (MM recommendation)	R.Ex.N°. 2463/2017 R.Pesq.N°. 95/2017	Yes	No	10) Capture of specimens under commercial size
Establishment of space-time closures in real time when areas with the presence of prohibited species are observed or with a limited landing percentage (Recommendations of mm) Protocol "move on" according to R.Ex.No.5559/2018	R.Ex.N°. 2463/2017 R.Pesq.N°. 95/2017 D.Ex.N°. 45/2020 R.Ex.N°. 46/2022	Yes	No	2) Exceeding the permitted limit of accompanying fauna 3) Capture of unauthorized species (without fishing permit) 9) Catches of non-commercial species
It is allowed for both fleets (artisanal and industrial), the transfer catch that cannot be brought on board due to limitations in the warehouse capacity (MM, Subsequently implemented through of the R.Ex.No. 862/2021).	R.Ex.N°. 2463/2017 (Subpesca, 2017b) R.Pesq.N°. 95/2017 (Subpesca, 2017a) (Subpesca, 2021b)	Yes	Yes	11) Exceeds warehouse capacity 12) Exceeds operating capacity or security considerations (tacked)
Do not perform draft when there is little volume available in the cellar (BP)	R.Ex.N°. 2463/2017 R.Pesq.N°. 95/2017 R.Ex.N°. 862/2021	No	No	11) Exceeds warehouse capacity

Figure 6. Mitigation measures and good practice recommendations for the industrial and artisanal purse seine fishery for Araucanian and anchovy of the central south zone of Chile. Table adapted from Table 11 of IFOP (2022).

Main information of compliance in 2022 was published by SERNAPESCA (2022) and it says that due COVID 19, in the past years, access to on land inspections were restrained, impacting control activities. To compensate, the control effort was maintained through remote inspections, intensified electronic monitoring of the operations of fishing agents (vessels, traders, farming centres and processing plants). Besides the analysis of operating data declared by users and the reviews of consistency to detect eventual breaches kept going.

A total of 6 special control programs were developed at national level, summed with the ongoing control activities at regional level and others general controls. 92,851 total activities were developed in 2022, 39.8% of the total national effort was focused in Biobío region. 51.3% of the national inspections were for quota control, 21.1% to access control (authorizations), 15.1% to control of closed seasons and 7% to the accreditation of legal origin.

In the artisanal sector, there is a daily average of artisanal vessels transmitting a satellite position that reached 400 in 2022. The range of artisanal and industrial vessels operating with satellite positioner daily ranged between 278 and 517 vessels.

According to SERNAPESCA (2022), regarding to complaints to courts in which the SERNAPESCA, the regions of Los Lagos with 17.9%, Coquimbo (10.5%) and Antofagasta (9.5%) are the ones that register a higher proportion of complaints in 2022. The most frequently detected breaches in 2022 were associated with contravening associated provisions referring to the Proof of Legal Origin (22.6%) and catches during closed season, with 12.6%. Regarding to complains associated to specific species, only 3.8% of the complains included anchovy. 93 violations that came to judgment sentencing executed, 35,5% were in Los Lagos, 10,8 % in Biobío and 6,5% in Valparaíso. In addition to the complaints in court, a total of 20 sanctioning resolutions of an administrative nature initiated in 2022, in which the competent body is the National Service of Fisheries and Aquaculture.

Recently it was implemented the National Supervision Plan of SERNAPESCA 2022, with two Special Inspection Programs: “Landing Control (fishing and landing area)” and “Combating Illegal Fishing in the Value Chain”.

Compliance with laws and regulations is actively monitored. Sub-clause M2.4 is met.

References

IFOP. 2022. Programa de observadores científicos: Programa de investigación y monitoreo del descarte y de la captura de pesca incidental en pesquerías pelágicas, año 2021-2022. INFORME FINAL. Convenio de Desempeño 2021. https://www.ifop.cl/wp-content/contenidos/uploads/RepositorioIfop/InformeFinal/2022/P-581180_mejorado.pdf

SERNAPESCA. 2022. Fiscalización en pesca y acuicultura. Informe de actividades. servicio nacional de pesca y acuicultura de 2022. http://www.sernapesca.cl/sites/default/files/ifpa_2022.pdf

Links

MarinTrust Standard clause	1.3.1.3
FAO CCRF	7.7.2
GSSI	D1.09

CATEGORY A SPECIES

Species Name		anchovy (<i>Engraulis ringens</i>)																															
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																														
<p>A1.1 Landings data are collected such that the fishery-wide removals of this species are known.</p> <p>Fishery-dependent data is collected through port sampling of landings (SERNAPESCA Inspectors) and observer reports (IFOP directed). In 2022 the landings reported of anchovy by SERNAPESCA in regions V-X were 218,808 tonnes as follows</p> <table border="1"> <thead> <tr> <th>Species</th> <th>V</th> <th>VI</th> <th>VII</th> <th>XVI</th> <th>VIII</th> <th>IX</th> <th>XIV</th> <th>X</th> <th>Total</th> </tr> </thead> <tbody> <tr> <td>Chile Anchovy</td> <td>2</td> <td>-</td> <td>-</td> <td>-</td> <td>202.570</td> <td>-</td> <td>11.266</td> <td>4.970</td> <td>218.808</td> </tr> <tr> <td>Araucanian Herring</td> <td>43</td> <td>-</td> <td>-</td> <td>-</td> <td>146.204</td> <td>-</td> <td>75.396</td> <td>2.292</td> <td>223.935</td> </tr> </tbody> </table> <p>Figure 7. Landing data per Chile region (t) [SERNAPESCA, 2022].</p> <p>Landings data are collected such that the fishery-wide removals of this species are known. Sub-clause A1.1 is met.</p> <p>A1.2 Sufficient additional information is collected to enable an indication of stock status to be estimated.</p> <p>Hydroacoustic surveys have been conducted biannually since 1999 by means of two cruises: RECLAS in January (summer season; over the recruitment period) and PELACES in May (autumn season). As this method does not consider stock reproductive dynamics, assessments of Spawning Stock Biomass (SSB) for small pelagic fish with partial spawning are conducted through the Daily Egg Production Method (DEPM). Intra-annual updates of stock assessment, advice and quota are conducted as updated information becomes available from (April-May) and summer (Dec-Jan) based on the research surveys mentioned above.</p> <p>In December 2022, it was published acoustic estimates of biomass (in weight) and abundance (in number) of anchovy and Araucanian herring for the regions between Valparaíso and Los Lagos (IFOP, 2023). In August 2022, it was published the evaluation of the anchovy and Araucanian herring spawning stock biomass during their maximum reproductive activity (Grendi et al., 2022). In May 2023, the Technical Scientific Committee on Small Pelagic Fisheries made the recommendation of status and Biologically Acceptable Catch (BAC) of anchovy and Araucanian herring using the updated model presented by IFOP for the BAC given in the beginning of 2023, which corresponding to a statistical model with observations and data of age, annual scale and biological year, and data of the biomass and age structure from the acoustic cruise RECLAS 2023, total catches of the year 2022, age composition of the fleet in 2022, average weights years from 2022 and discard (CCT-PP, 2023).</p> <p>Sufficient additional information is collected to enable an indication of stock status to be estimated. Sub-clause A1.2 is met</p>				Species	V	VI	VII	XVI	VIII	IX	XIV	X	Total	Chile Anchovy	2	-	-	-	202.570	-	11.266	4.970	218.808	Araucanian Herring	43	-	-	-	146.204	-	75.396	2.292	223.935
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<p>SERNAPESCA.2022. Anuario Estadístico de Pesca y Acuicultura. Chile,Desembarque total por especie y región, 2022. http://www.sernapesca.cl/informacion-utilidad/anuarios-estadisticos-de-pesca-y-acuicultura</p> <p>CCT-PP. 2023. REPORTE TÉCNICO N°01/2023 de la primera sesión del Comité Científico Técnico de Pesquerías de Pequeños Pelágicos, año 2023. Available in: https://www.SUBPESCA.cl/portal/616/articles-118441_documento.pdf</p> <p>Grendi, C., L. Cubillos, L. Castro, S. Soto, G. Claramunt et al. 2022. Evaluación del stock desovante de anchovy y sardina común entre las regiones de Valparaíso y Los Lagos, año 2021. Informe Final. Convenio de Desempeño 2021, Instituto de Fomento Pesquero, Valparaíso. https://www.ifop.cl/wp-content/uploads/RepositorioIfop/InformeFinal/2022/P-685020.pdf</p>																																	

IFOP. 2023. Evaluación hidroacústica de los stocks de anchovy y sardina común entre las Regiones de Valparaíso y Los Lagos, año 2022. Informe Final. Convenio de Desempeño 2021, Instituto de Fomento Pesquero, Valparaíso. <https://www.ifop.cl/wp-content/contenidos/uploads/Repositorioifop/InformeFinal/2023/P-682091.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.	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.

Intra-annual updates of stock assessment, advice and quota are conducted as updated information becomes available from (April-May) and summer (Dec-Jan) based on Hydroacoustic surveys and assessments of Spawning Stock Biomass (SSB).

Hydroacoustic surveys have been conducted biannually since 1999 by means of two cruises: RECLAS in January (summer season; over the recruitment period) and PELACES in May (autumn season). As this method does not consider stock reproductive dynamics, assessments of SSB for small pelagic fish with partial spawning are conducted through the Daily Egg Production Method (DEPM). IFOP conducts annual stock status assessments and presents to SUBPESCA through meetings of the CCT-PP.

A stock assessment is conducted at least once every 3 years and considers all fishery removals and the biological characteristics of the species. Sub-clause 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.

CCT-PP usually use as proxy for stock assessment biomass, mortality by fish and exploitation rate. On the latest stock assessment published in March 2023 by SUBPESCA¹ (2023), CCT-PP considered for the definition of the status and Biologically Acceptable Catch – BAC range of anchovy from Valparaíso to Los Lagos region, by the year 2022, the proxies established on Report CCT-PP No. 01/2015, reflected in Ex. Res. No. 291 of 2015:

Proxy SSB_{MSY} = 60% of $SSBR$ or 55% SSB_0 ; 487,000 t.

SSB_{lim} = 27,5% SSB_0 ; 243,000 t.

Proxy F_{MSY} = F 60% $SSBR$; 0,46

Where:

SSB_{MSY} = Spawning biomass at maximum sustainable yield

$SSBR$ = Spawning Biomass per Recruit

SSB_0 = Virginal spawning biomass spawning (estimated from stock-recruitment models: biomass of equilibrium, without fishery exploitation)

SSB_{lim} = Limit reference point for Spawning Stock Biomass

F_{MSY} = the fishing mortality that will maintain a stock at maximum sustainable yield

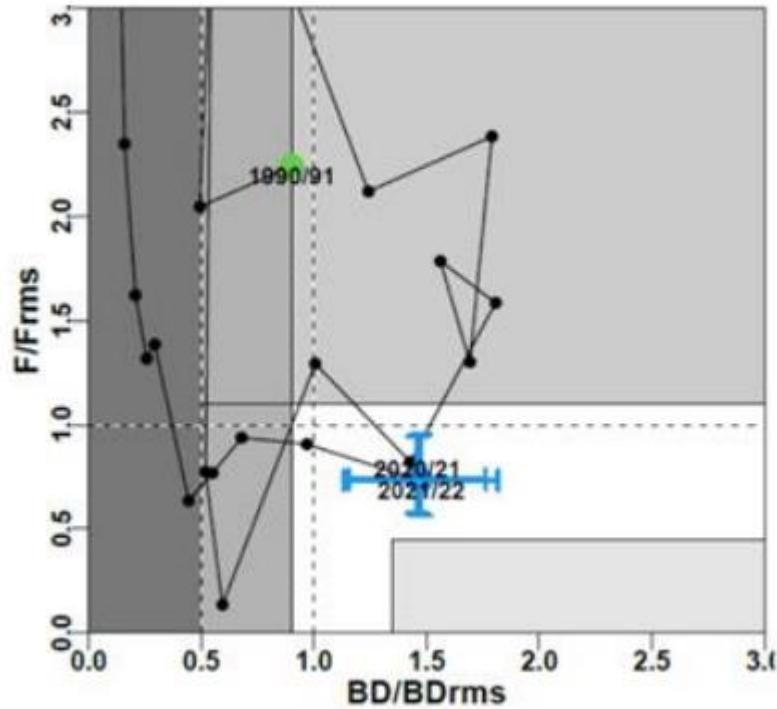


Figure 8. Diagram of exploitation phases of the spawning biomass regarding the fishing mortality of the anchovy assessment from September 2022. The axes are standardized to the values that generate the proxy MRS. Blue cross corresponds to the intervals of confidence of the ratio SSB/SSB_{MSY} (“BD/BDR_{RMS}”, in Spanish) and F/F_{MSY} (“F/F_{RMS}”, in Spanish). The year with a continuous cross corresponds to Full Status (SUBPESCA¹,2023).

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

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

Total Allowable Catches (TACs) are defined every year following the scientific advice (SUBPESCA¹, 2023a). CCT-PP recommended total maximum BAC tending to a MSY equivalent to 178,029 t. However, considering an estimate of 2% discards rate for 2023 year, the maximum BAC set was 178.677 t in a range of 142,942 to 178,677 t for 2023 (SUBPESCA¹, 2023a).

The assessment provides an estimate of the status of the biological stock relative to a reference point or proxy. Sub-clause A2.3 is met.

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

Stock assessments and the management approach used in the fishery undergo detailed peer review through annual CCT-PP meetings. These peer reviews can be considered both internal and external as members of committees may also be outside the assessment process. Both IFOP and SUBPESCA have also commissioned external peer reviews for

their publications. The Chilean authorities have also invited international experts to evaluate their setting of biological reference points within the MSY framework.

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

A2.5 The assessment is made publicly available.

Reports of stock assessments and advice on TAC's can be found on IFOP and SUBPESCA's website (SUBPESCA³, 2023c). Minutes of CNP, Management Committee and CCT-PP meetings ("Actas", in Spanish) and summaries of the stock assessment are published on SUBPESCA's website (SUBPESCA², 2023b). Stock-recruitment and spawning period are closely monitored by IFOP and published in monthly bulletins ("Informes", in Spanish), which also contain details of closed seasons by area and general information about the stock status. All the information is available online and some of them is available only under request). All information required to update the re-approval and complete this assessment was available online.

The assessment is made publicly available. Sub-clause A2.5 is met.

References

SUBPESCA¹. 2023a. Estado de la situación de las principales pesquerías chilenas, 2022. https://www.SUBPESCA.cl/portal/618/articles-117812_recurso_1.pdf

SUBPESCA². 2023b. SUBPESCA Website. Section "Institucionalidad" <https://www.SUBPESCA.cl/portal/616/w3-propertyname-539.html>

SUBPESCA³. 2023c. SUBPESCA Website. Section "Cuenta pública de estado de recursos" <https://www.SUBPESCA.cl/portal/618/w3-propertyvalue-792.html>

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	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.

TAC is reviewed and updated annually based on scientist recommendations, historical series of data and biannual surveys. Annual BAC are divided into three categories: research, industrial and artisanal. 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 maximum sustainable yield. Workshops have been provided by government to demonstrate best fishing practice, including measures for reducing discards and bycatch. Temporary closure orders have been issued by government when high proportions of juvenile anchovy have been detected.

There is a mechanism in place by which total fishing mortality of this species is restricted. Therefore, sub-clause A3.1 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.

Although in 2016/17, F_t levels were below the target level, the fishing mortality levels ($F_t \text{ yr}^{-1}$) of anchovy, in general, have historically remained above the target reference level of FMSY. Regarding the current condition of central-south anchovy, studies indicate a recovery of the stock from 2016/2017 levels generated by the increase in recruitment in 2018/19 and 2019/20, the decrease in mortality from fishing below the management target ($F < \text{FMSY}$) and 2/3 below natural mortality ($M = 0.7 \text{ yr}^{-1}$) and the increase in total spawning biomass for the years 2019/20, 2020/21 and 2021/2022. Therefore, the central-south anchovy is in a condition of full-exploitation without probability of over-exploitation (0%) [CCT-PP, 2022].

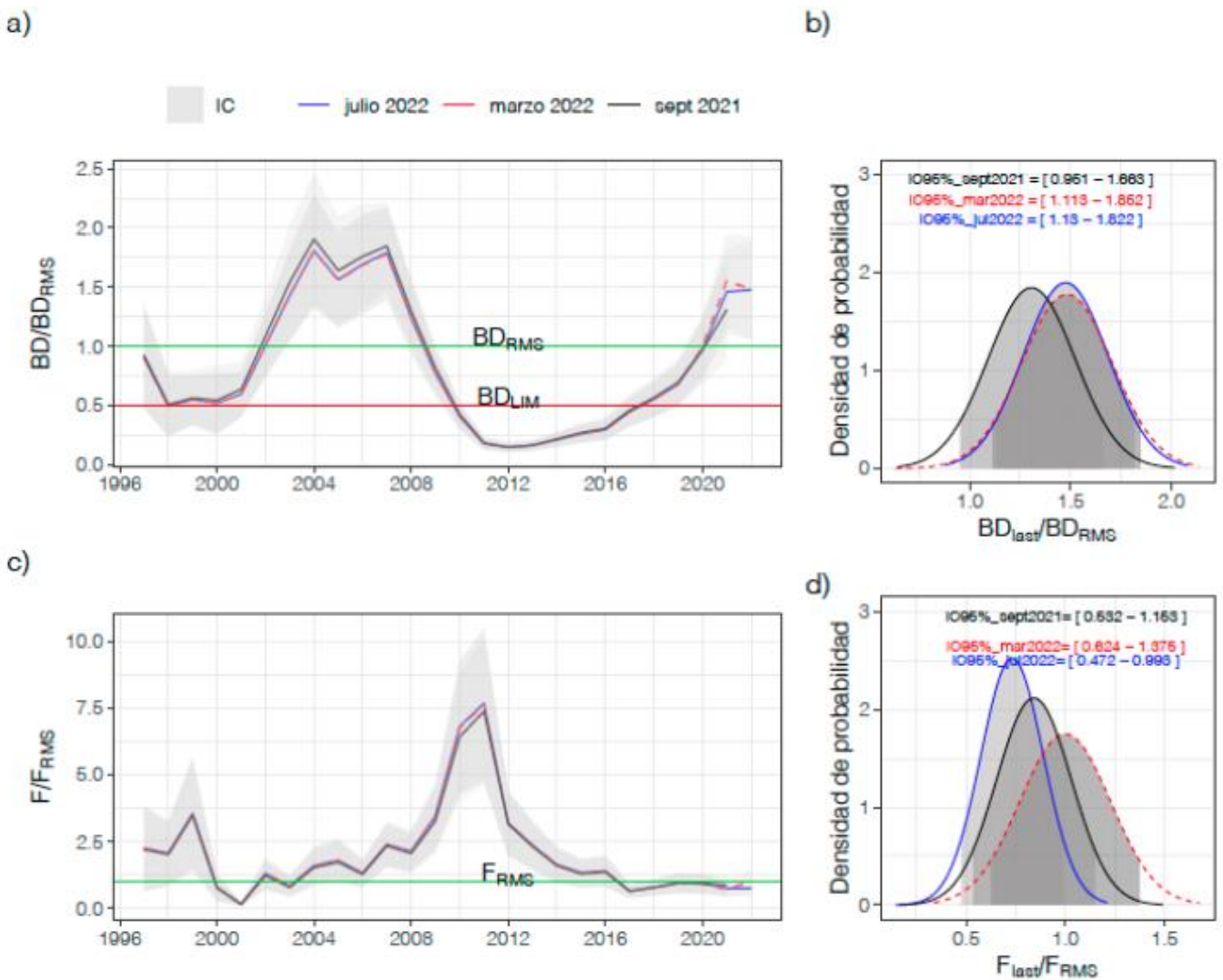


Figure 9. a) SSB/SSBMSY ratio, b) the probability distribution of $SSB_{last}/SSBMSY$, c) ratio F/F_{RMS} and d) the F_{last}/F_{RMS} probability distribution for anchovy stock from south-central region of Chile.

The last publication of CCT-PP [May 2023] reported that the anchovy stock in the central-south zone is maintained for the third year in a state of full exploitation for the biological year 2022/2023, with a spawning biomass 39% higher than the SSBMSY from the previous assessment and a fishing mortality equivalent to FMSY ($SSB/SSBMSY = 1.39$ and $F/F_{RMS} = 1.00$), with a practically nil probability of overexploitation and 0.33 of overfishing [CCT-PP, 2023].

The TAC determined for artisanal fishery in 2022 was 184,895t and the total landing was 621,83 t (SERNAPESCA, 2023).

Tabla 3. Consumo de la cuota global de Anchoveta 2022. Resumen general de la pesquería. Datos en toneladas.

	Cuota Asignada	Movimiento	Cuota Efectiva	Captura	Saldo	% Consumido
Fracción Industrial Objetivo	52192,005	-50544,623	1647,382	933,984	713,398	56,70%
Fracción Artesanal Objetivo	184895,993	50544,623	235440,616	173256,890	62183,726	73,59%
Fauna Acompañante	150	0	150	0	150	0,00%
Investigación	150	0	150	0,76	150	1,00%
Imprevisto	2422	0	2422	0	2422	0,00%
Consumo Humano	2422	0	2422	1006,704	1415,296	41,56%
Total	242231,998	0	242231,998	175198,338	67034,420	72%

Figure 10. Consumption of the global quota for Araucanian herring in 2022. General summary of the fishery. Data in tons. Translations of Spanish words of the table to English: *Fracción Industrial Objetivo* = Industrial Fraction target; *Fracción Artesanal Objetivo* = Artisan Fraction target; *Fauna Acompañante* = bycatch; *Investigación* = research; *Imprevisto* = unpredicted; *consumo humano* = human consumption; *Cuota asignada* = Allocated quota; *Movimiento* = movement; *Cuota Efectiva* = effective quota; *Captura* = catch, *Saldo* = balance; *Consumido* = consumed.

Since 2016, total fishery removals of this species do not regularly exceed the level indicated or stated in the stock assessment, thus sub-clause 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).

The Fisheries Act (LGPA) does not establish catch restrictions when stocks are below limit biomass (for social and economic reasons and to facilitate further research). Instead, a resource recovery plan must be implemented. Management committees are required to elaborate and implement such recovery plans (Article 9 of LGPA); implying reductions in fishing mortality at levels below or equal to FRMS. There is a mechanism of TAC in place, which involves three estimations and a review per year. Corrections of the TAC for the year are made when necessary and this information is available every March 15 and July 15. Chile has been working on the review of the management cycle of the pelagic fishery of central-south Chile and establishing a new dynamic and flexible closure mechanism (Comité de manejo anchovy y Sardina común, 2023) for anchovy and Araucanian herring fishery. The mechanism is an improvement to the current process, eliminating the rigidity of fixed periods. The new proposal will consider biological data updated through the year. Historically, artisanal fisheries have respected TACs for anchovy.

Sub-clause A3.3 is met.

References

Comité de manejo anchovy y Sardina común (2023). ACTA SINTÉTICA SESIÓN N°01. https://www.SUBPESCA.cl/portal/616/articles-117173_documento.pdf

CCT-PP. 2022. Informe Técnico N°2, de la quinta sesión del Comité Científico Técnico de Pesquerías de Pequeños Pelágicos, año 2022. https://www.SUBPESCA.cl/portal/616/articles-115956_documento.pdf

CCT-PP. 2023. Reporte Técnico N°1, de la primera sesión del Comité Científico Técnico de Pesquerías de Pequeños Pelágicos, año 2023. https://www.SUBPESCA.cl/portal/616/articles-118441_documento.pdf

SERNAPESCA. 2023. Informe Estado Anual Cuotas Sector Artesanal e Industrial Año 2022.

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	<p>The stock is at or above the target reference point, OR IF NOT:</p> <p>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:</p> <p>The stock is estimated to be below the limit reference point or proxy, but fishery removals are prohibited.</p>	Yes
Clause outcome:		Pass
<p>A4.1 The stock is at or above the target reference point, OR IF NOT:</p> <p>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:</p> <p>The stock is estimated to be below the limit reference point or proxy, but fishery removals are prohibited.</p> <p>The last publication of CCT-PP [May 2023] reported that the anchovy stock in the central-south zone is maintained for the third year in a state of full exploitation for the biological year 2022/2023, with a spawning biomass 39% higher than the SSBMSY from the previous assessment and a fishing mortality equivalent to FMSY (SSB/SSBMSY=1.39 and F/FMSY=1.00), with a practically nil probability of overexploitation and 0.33 of overfishing [CCT-PP, 2023].</p>		

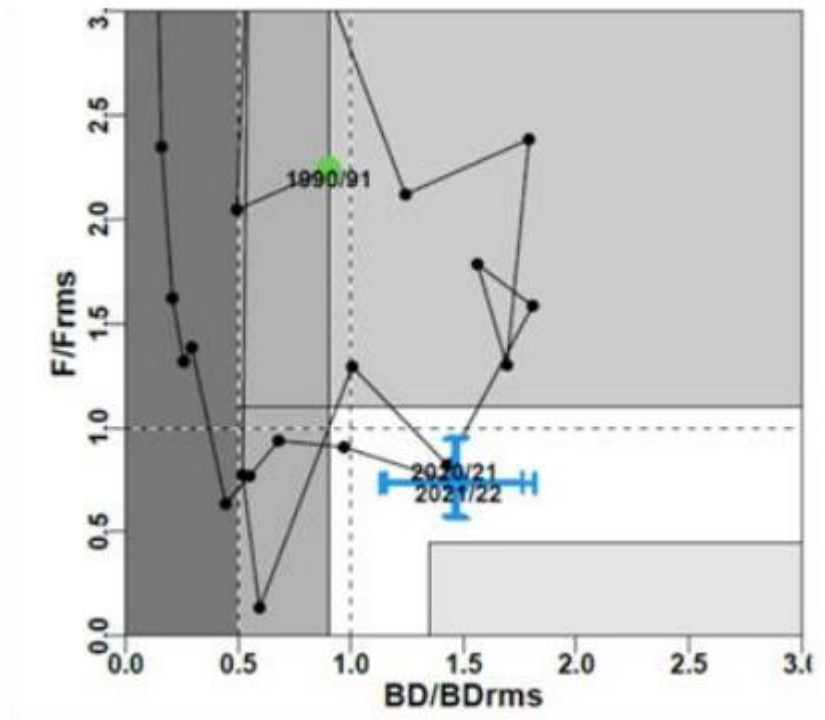


Figure 11. Diagram of exploitation phases of the spawning biomass regarding the fishing mortality of the anchovy assessment from September 2022. The axes are standardized to the values that generate the proxy MRS. Blue cross corresponds to the intervals of confidence of the ratio SSB/SSB_{MSY} (“BD/BDR_{MSY}”, in Spanish) and F/F_{MSY} (“F/F_{RMS}”, in Spanish). The year with a continuous cross corresponds to Full Status (SUBPESCA,2023).

The spawning biomass is above the limit reference point and the fishing mortality is at the limit reference point, thus the stock is at or above the target reference point. Sub-clause A4.1 is met.

References

CCT-PP. 2023. Reporte Técnico N°1, de la primera sesión del Comité Científico Técnico de Pesquerías de Pequeños Pelágicos, año 2023. https://www.SUBPESCA.cl/portal/616/articles-118441_documento.pdf

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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
GSSI	D6 01

Species Name		Araucanian herring, <i>Strangomera bentincki</i>	
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.

Fishery-dependent data is collected through port sampling of landings (SERNAPESCA Inspectors) and observer reports (IFOP directed). In 2022 the landings reported of Araucanian herring, by SERNAPESCA in regions V-X were 223,935 tonnes as follows:

Species	V	VI	VII	XVI	VIII	IX	XIV	X	Total
Chile Anchovy	2	-	-	-	202.570	-	11.266	4.970	218.808
Araucanian Herring	43	-	-	-	146.204	-	75.396	2.292	223.935

Figure 12. Landing data per Chile region (t) [SERNAPESCA, 2022].

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

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

Hydroacoustic surveys have been conducted biannually since 1999 by means of two cruises: RECLAS in January (summer season; over the recruitment period) and PELACES in May (autumn season). As this method does not consider stock reproductive dynamics, assessments of Spawning Stock Biomass (SSB) for small pelagic fish with partial spawning are conducted through the Daily Egg Production Method (DEPM). Intra-annual updates of stock assessment, advice and quota are conducted as updated information becomes available from (April-May) and summer (Dec-Jan) based on the research surveys mentioned above.

In December 2022, it was published acoustic estimates of biomass (in weight) and abundance (in number) of anchovy and Araucanian herring for the regions between Valparaíso and Los Lagos (IFOP, 2023). In August 2022, it was published the evaluation of the anchovy and Araucanian herring spawning stock biomass during their maximum reproductive activity (Grendi et al., 2022). In May 2023, the Technical Scientific Committee on Small Pelagic Fisheries made the recommendation of status and BAC of anchovy and Araucanian herring, using the updated model presented by IFOP for the BAC given in the beginning of 2023, which corresponding to a statistical model with observations and data of age, annual scale and biological year, and data of the biomass and age structure from the acoustic cruise RECLAS 2023, total catches of the year 2022, age composition of the fleet in 2022, average weights years from 2022 and discard (CCT-PP, 2023).

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

References

SERNAPESCA. 2022. Anuario Estadístico de Pesca y Acuicultura. Chile, Desembarque total por especie y región, 2022. <http://www.sernapesca.cl/informacion-utilidad/anuarios-estadisticos-de-pesca-y-acuicultura>

CCT-PP. 2023. REPORTE TÉCNICO N°01/2023 de la primera sesión del Comité Científico Técnico de Pesquerías de Pequeños Pelágicos, año 2023. Available in: https://www.SUBPESCA.cl/portal/616/articles-118441_documento.pdf

Grendi, C., L. Cubillos, L. Castro, S. Soto, G. Claramunt et al. 2022. Evaluación del stock desovante de anchovy y sardina común entre las regiones de Valparaíso y Los Lagos, año 2021. Informe Final. Convenio de Desempeño 2021, Instituto de Fomento Pesquero, Valparaíso. <https://www.ifop.cl/wp-content/uploads/RepositorioIfop/InformeFinal/2022/P-685020.pdf>

IFOP. 2023. Evaluación hidroacústica de los stocks de anchovy y sardina común entre las Regiones de Valparaíso y Los Lagos, año 2022. Informe Final. Convenio de Desempeño 2021, Instituto de Fomento Pesquero, Valparaíso. <https://www.ifop.cl/wp-content/uploads/RepositorioIfop/InformeFinal/2023/P-682091.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.	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
<p>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.</p> <p>Intra-annual updates of stock assessment, advice and quota are conducted as updated information becomes available from (April-May) and summer (Dec-Jan) based on Hydroacoustic surveys and assessments of Spawning Stock Biomass (SSB).</p> <p>Hydroacoustic surveys have been conducted biannually since 1999 by means of two cruises: RECLAS in January (summer season; over the recruitment period) and PELACES in May (autumn season). As this method does not consider stock reproductive dynamics, assessments of SSB for small pelagic fish with partial spawning are conducted through the Daily Egg Production Method (DEPM). IFOP conducts annual stock status assessments and presents to SUBPESCA through meetings of the CCT-PP.</p> <p>A stock assessment is conducted at least once every 3 years and considers all fishery removals and the biological characteristics of the species. Sub-clause A2.1 is met.</p> <p>A2.2 The assessment provides an estimate of the status of the biological stock relative to a reference point or proxy.</p> <p>CCT-PP usually use as proxy for stock assessment biomass, mortality by fish and exploitation rate. On the latest stock assessment published in March 2023 by SUBPESCA¹ (2023a), CCT-PP considered for the definition of the status and BAC range of Araucanian herring from Valparaíso to Los Lagos region, by the year 2022, the proxies established on Report CCT-PP No. 01/2015, reflected in Ex. Res. No. 291 of 2015:</p> <p>Proxy $SSB_{msy} = 60\%$ of $SSBR$ or 55% SSB_0; 859,000 t. $SSB_{lim} = 27.5\%$ SSB_0; 430,000 t. Proxy $F_{MSY} = F$ 60% $SSBR$; 0,30</p> <p>Where:</p> <p>SSB_{MSY} = Spawning biomass at maximum sustainable yield $SSBR$ = Spawning Biomass per Recruit SSB_0 = Virginal spawning biomass spawning (estimated from stock-recruitment models: biomass of equilibrium, without fishery exploitation) SSB_{lim} = Limit reference point for Spawning Stock Biomass F_{MSY} = the fishing mortality that will maintain a stock at maximum sustainable yield</p>			

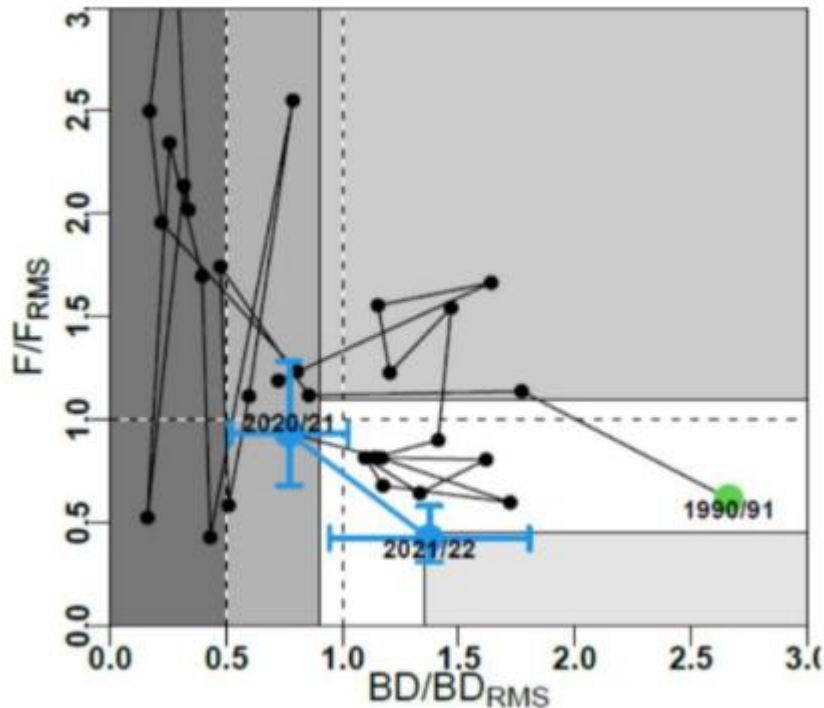


Figure 13. Diagram of exploitation phases of the spawning biomass regarding the fishing mortality of the Araucanian herring assessment from September 2022. The axes are standardized to the values that generate the proxy RMS. Blue cross corresponds to the intervals of confidence of the ratio SSB/SSB_{MSY} (BD/BDR_{RMS} , in Spanish) and F/F_{MSY} (" F/F_{RMS} ", in Spanish). The year with a continuous cross corresponds to Full Status (SUBPESCA¹,2023).

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

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

TACs are defined every year following the scientific advice (SUBPESCA¹, 2023a). CCT-PP recommended total maximum BAC tending to a MSY equivalent to 306,099 t. However, considering an estimate of discards rate of 4%, the maximum BAC set was 293,852 t in a range of 235,082 a 293,852 t for 2023 (SUBPESCA¹, 2023a).

The assessment provides an estimate of the status of the biological stock relative to a reference point or proxy. Sub-clause A2.3 is met.

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

Stock assessments and the management approach used in the fishery undergo detailed peer review through annual CCT-PP meetings. These peer reviews can be considered both internal and external as members of committees may also be outside the assessment process. Both IFOP and SUBPESCA have also commissioned external peer reviews for their publications. The Chilean authorities have also invited international experts to evaluate their setting of biological reference points within the MSY framework.

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

A2.5 The assessment is made publicly available.

Reports of stock assessments and advice on TAC's can be found on IFOP and SUBPESCA's website (SUBPESCA³, 2023c). Minutes of CNP, Management Committee and CCT-PP meetings ("*Actas*", in Spanish) and summaries of the stock assessment are published on SUBPESCA's website (SUBPESCA², 2023b). Stock-recruitment and spawning period are closely monitored by IFOP and published in monthly bulletins ("*Informes*", in Spanish), which also contain details of

closed seasons by area and general information about the stock status. All the information is available online and some of them is available only under request). All information required to update the re-approval and complete this assessment was available online.

The assessment is made publicly available. Sub-clause A2.5 is met.

References

SUBPESCA¹. 2023. Estado de la situación de las principales pesquerías chilenas, 2022. https://www.SUBPESCA.cl/portal/618/articulos-117812_recurso_1.pdf

SUBPESCA². 2023. SUBPESCA Website. Section “Institucionalidad” <https://www.SUBPESCA.cl/portal/616/w3-propertyname-539.html>

SUBPESCA³. 2023. SUBPESCA Website. Section “Cuenta pública de estado de recursos” <https://www.SUBPESCA.cl/portal/618/w3-propertyvalue-792.html>

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.

TAC is reviewed and updated annually based on scientist recommendations, historical series of data and biannual surveys. Annual BAC are divided into three categories: research, industrial and artisanal. 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 maximum sustainable yield. Workshops have been provided by government to demonstrate best fishing practice, including measures for reducing discards and bycatch. Temporary closure orders have been issued by government when high proportions of juvenile anchovy have been detected.

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

Although historically fishing mortality of Araucanian herring has been above FMSY level, from 2005 and onwards, fishing mortality has followed a downward trend. IFOP (2022) has shown that fishing mortality has been at the FMSY level since 2015. The last publication of CCT-PP [May 2023], pointed F/FMSY= 1.0, with a probability p=0.62 of over-exploitation and p=0.36 of overfishing (CCT-PP, 2023).

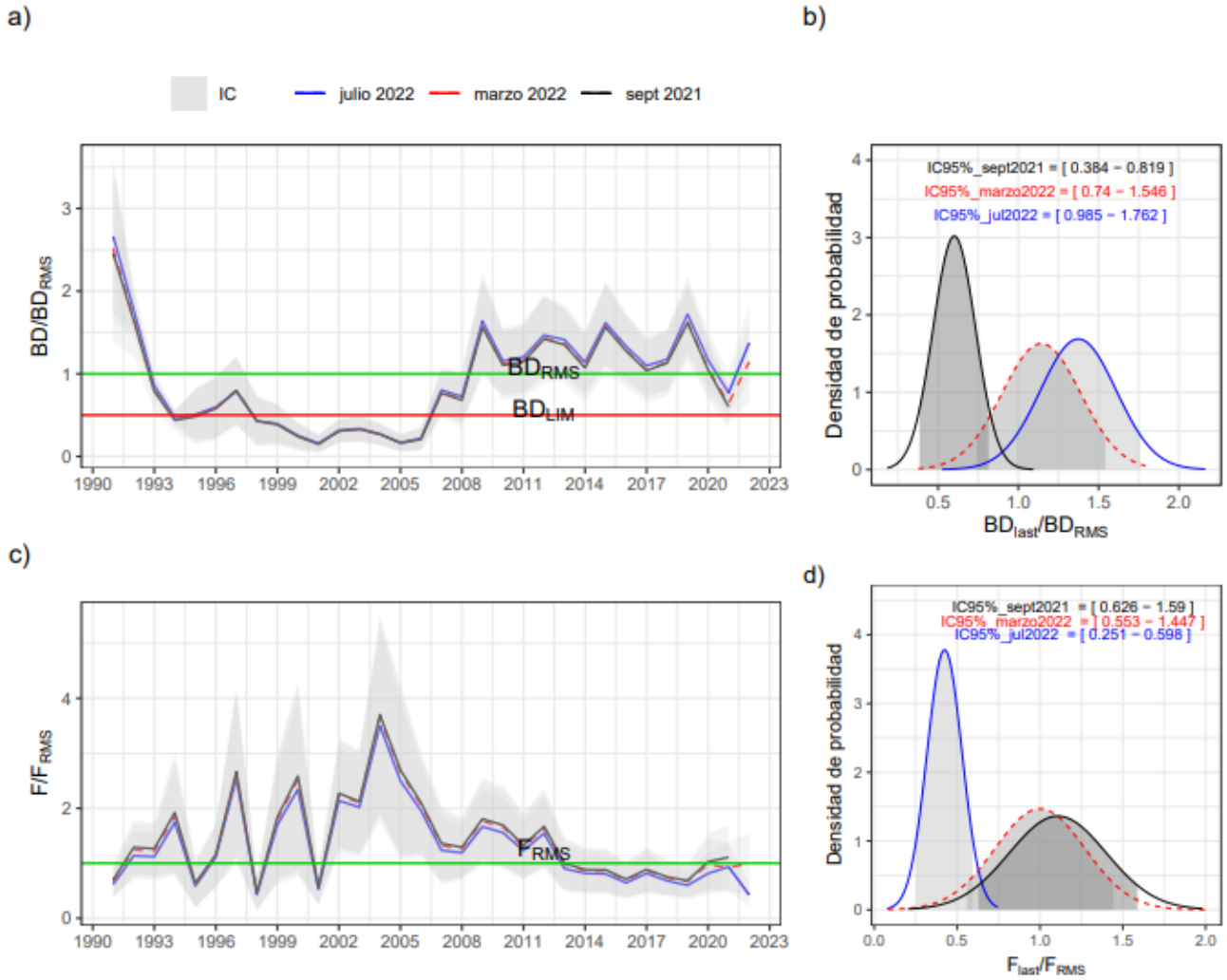


Figure 14. a) SSB/SSB_{MSY} ratio, b) the probability distribution of SSB_{last}/SSB_{MSY} , c) ratio F/F_{MSY} and d) the F_{last}/F_{MSY} probability distribution for Araucanian herring stock from south-central region of Chile. The years on the x-axis correspond to biological year (IFOP, 2022).

According to data from reports named “Annual Status Report Sector Quotas Artisanal and Industrial Year 2022” (“Informe Estado Anual Cuotas Sector Artesanal e Industrial Año 2022”, in Spanish) published every year, quotas has been respected through the years. For instance, the TAC determined for artisanal fishery in 2022 was 275,139t and the total landing was 163.483 t (SERNAPESCA, 2023).

Tabla 5. Consumo de la cuota global de Sardina Común 2022. Resumen general de la pesquería. Datos en toneladas.

	Cuota Asignada	Movimiento	Cuota Efectiva	Captura	Saldo	% Consumido
Fracción Industrial Objetivo	77680	-71604,684	6075,316	5445,591	629,725	89,63%
Fracción Artesanal Objetivo	275139,984	74865,77	350005,754	163483,460	186522,294	46,71%
Fauna Acompañante	270	0	270	0	270	0,00%
Investigación	180	0	180	0,149	179,851	0,08%
Imprevisto	3605	-3261,086	343,914	0	343,914	0,00%
Consumo Humano	3605	0	3605	582,705	3022,295	16,16%
Total	360479,984	0	360479,984	169511,905	190968,079	47%

Figure 15. Consumption of the global quota for Araucanian herring in 2022. General summary of the fishery. Data in tons. Translations of Spanish words of the table to English: *Fracción Industrial Objetivo* = Industrial Fraction target; *Fracción Artesanal Objetivo* = Artisan Fraction target; *Fauna Acompañante* = bycatch; *Investigación* = research; *Imprevisto* = unpredicted; *consumo humano* = human consumption; *Cuota asignada* = Allocated quota; *Movimiento* = movement; *Cuota Efectiva* = effective quota; *Captura* = catch, *Saldo* = balance; *Consumido* = consumed.

Total fishery removals of this species do not regularly exceed the level indicated or stated in the stock assessment. Sub-clause 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).

The Fisheries Act (LGPA) does not establish catch restrictions when stocks are below limit biomass (for social and economic reasons and to facilitate further research). Instead, a resource recovery plan must be implemented. Management committees are required to elaborate and implement such recovery plans (Article 9 of LGPA); implying reductions in fishing mortality at levels below or equal to FRMS. There is a mechanism of TAC in place, which involves three estimations and a review per year. Corrections of the TAC for the year are made when necessary and this information is available every March 15 and July 15. Chile has been working on the review of the management cycle of the pelagic fishery of central-south Chile and establishing a new dynamic and flexible closure mechanism (Comité de manejo anchovy y Sardina común, 2023) for anchovy and Araucanian herring fishery. The mechanism is an improvement to the current process, eliminating the rigidity of fixed periods. The new proposal will consider biological data updated through the year. CCT-PP has been discussed the need to reduce the BAC range for 2023 considering the current status of overexploitation of Araucanian herring (CCT-PP, 2023). Historically, artisanal fisheries have complied with TACs, but the organizations involved in fishery management are attentive to stock status and discussing mechanisms to address this situation.

Sub-clause A3.3 is met.

References

Comité de manejo anchovy y Sardina común (2023). ACTA SINTÉTICA SESIÓN N°01. https://www.SUBPESCA.cl/portal/616/articles-117173_documento.pdf

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IFOP. 2022. Estatus y Posibilidades de Explotación Biológicamente Sustentables de Sardina común, Región de Valparaíso a la Región de Los Lagos, año 2022. Tercer Informe (Final). Convenio de Desempeño 2021, Instituto de Fomento Pesquero, Valparaíso. https://www.ifop.cl/wp-content/contenidos/uploads/RepositorioIfop/InformeFinal/2022/P-483259_sardinacomun.pdf

SERNAPESCA. 2023. Informe Estado Anual Cuotas Sector Artesanal e Industrial Año 2022. http://www.sernapesca.cl/sites/default/files/informe_final_cuotas_ano_2022_v20230331.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	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.
		Clause outcome: Pass
<p>A4.1 The stock is at or above the target reference point, OR IF NOT:</p> <p>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:</p> <p>The stock is estimated to be below the limit reference point or proxy, but fishery removals are prohibited.</p> <p>Although the last publication of CCT-PP [May 2023], pointed that Araucanian herring moved from a state of full exploitation in 2021/22 to over exploitation in 2022/23, reaching a spawning biomass of 15.3% under the SSBMSY; the mortality by fishing is at the FMSY level (SSB/SSBMSY=0.847 and F/FMSY= 1.0), with a probability $p=0.62$ of over-exploitation and $p=0.36$ of overfishing (CCT-PP, 2023) and the TAC determined for artisanal fishery in 2022 was 275,139t and the total landing was 163.483 t (SERNAPESCA¹, 2023a). In 2022 the recruitment suffered a sharp decrease, reaching 49.7% below the average recent recruitment, however it has been identified an important recovery, with an increase of 87.4% when comparing to 2021.</p> <p>Proxy SSBmsy = 60% of SSB_R or 55% SSB₀; 859,000 t. SSBlim = 27.5% SSB₀; 430,000 t. Proxy FMSY =F 60% SSB_R; 0,30</p>		

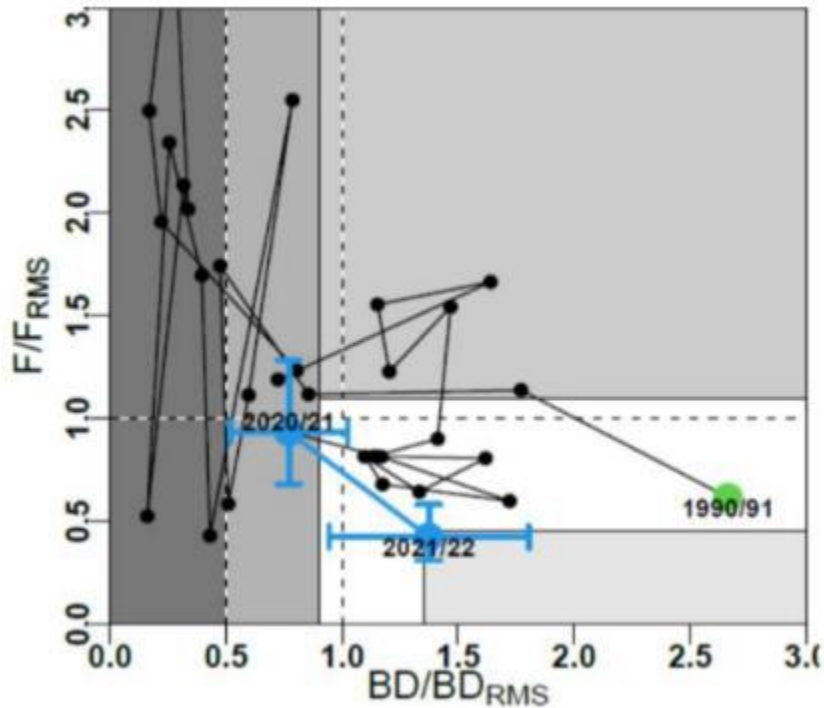


Figure 16. Diagram of exploitation phases of the spawning biomass regarding the fishing mortality of the Araucanian herring assessment from September 2022. The axes are standardized to the values that generate the proxy RMS. Blue cross corresponds to the intervals of confidence of the ratio SSB/SSB_{MSY} (BD/BDR_{RMS} , in Spanish) and F/F_{MSY} (" $F/FRMS$ ", in Spanish). The year with a continuous cross corresponds to Full Status (SUBPESCA², 2023b).

Thus, as the fishing mortality is at the limit reference point and the landings are below TAC, the stock is at or above the target reference point. Sub-clause A4.1 is met.

References

CCT-PP. 2023. Reporte Técnico N°1, de la primera sesión del Comité Científico Técnico de Pesquerías de Pequeños Pelágicos, año 2023. https://www.SUBPESCA.cl/portal/616/articles-118441_documento.pdf

SERNAPESCA¹. 2023a. Informe Estado Anual Cuotas Sector Artesanal e Industrial Año 2022. http://www.sernapesca.cl/sites/default/files/informe_final_cuotas_ano_2022_v20230331.pdf

SUBPESCA². 2023b. Estado de la situación de las principales pesquerías chilenas, 2022. https://www.subpesca.cl/portal/618/articles-117812_recurso_1.pdf

Links

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

CATEGORY D SPECIES

D1	Species Name	<i>Normanichthys crockeri</i> - mote sculpin (“bacadillo” or “mote”, in Spanish)	
	Productivity Attribute	Value	Score
	Average age at maturity (years)	0-2*	1
	Average maximum age (years)	10 – 15*	2
	Fecundity (eggs/spawning)	50,000 -200,000*	1
	Average maximum size (cm)	11	1
	Average size at maturity (cm)	11,5*	1
	Reproductive strategy	Broadcast spawner	1
	Mean trophic level	2.8	2
	Average Productivity Score		1,28
	Susceptibility Attribute	Value	Score
	Availability (area overlap)	The fish is endemic of the southeast Pacific	3
	Encounterability (the position of the stock/species within the water column relative to the fishing gear)	The species is usually found in 37 - 200 m, purse seine fisheries in Chile operate up to 130m high	3
	Selectivity of gear type	Mote catches of the species in Chile are usually 8,5 cm length	3
	Post-capture mortality	Retained	3
	Average Susceptibility Score		3
	PSA Risk Rating (From Table D3)		Pass
	Compliance rating		Pass
	Further justification for susceptibility scoring (where relevant)		
	<p>The <i>Normanichthys crockeri</i> - mote sculpin (“bacadillo or mote”, in Spanish) is a monotypic species from the Normanichthyidae family and from Scorpaeniformes order. In the southeastern Pacific, <i>Normanichthys crockeri</i> is the only epipelagic schooling Scorpaeniform that usually can be seen along with other fishes like Araucanian herring or the anchovy (Arrizaga et al., 1993). Mote sculpin is a small-bodied (up to 11 cm total length) and short-lived pelagic fish endemic to the southeast Pacific, which inhabits coastal waters from Chimbote, Peru to 44°S, southern Chile (Vegas & Pequeño 1993). As this species is not commercially important, it has been the subject of scarce research, although it has been noted an increase of landings Chile in recent years. Due lack of data, we consider here that the productivity attributes of mote sculpin would be similar to other small pelagic fishes in the region, such as anchovy and Araucanian herring. Landaeta et al (2010) have used a similar hypothesis for their study with larval growth and hatch dates of early stages of the mote sculpin. Thus, the values with an asterisk (*) are the ones estimated by the species based on available information from anchovy and Araucanian herring due the absence of data of mote sculpin and the ones without an asterisk are the ones found for <i>Normanichthys crockeri</i>.</p>		
References			
<p>Arrizaga, A., Fuentealba, M., Espinoza, C., Chong, J. & Oyarzún, C. 1993. Trophic habits of two pelagic fish species: <i>Strangomera bentincki</i> (Norman, 1936) and <i>Engraulis ringens</i> (Jenyns, 1842), in the littoral of the Biobio Region, Chile. Boletín de la Sociedad de Biología de Concepción, 64: 27-35.</p>			

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Landaeta, M.F., Inostroza, P.A., Ramírez, A., SotoMendoza, S. & Castro, L.R. 2010. Distribution patterns, larval growth and hatch dates of early stages of the mote sculpin *Normanichthys crockeri* (Scorpaeniformes, Normanichthyidae) in the upwelling ecosystem off central Chile. Revista de Biología. Marina y Oceanografía, 45(1): 575-588 https://www.scielo.cl/scielo.php?pid=S0718-19572010000400006&script=sci_abstract&tIng=en

Vega E, Pequeño G (1993) Contribución al conocimiento biológico de *Normanichthys crockeri* Clark, 1937 (Osteichthyes, Scorpaeniformes). Rev Biol Mar 28:1–36 <https://rbmo.uv.cl/escaneados/281-1.pdf>

Standard clauses 1.3.2.2

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	Evidence of majority released post-	Evidence of some released post-capture and survival.	Retained species or majority dead when released.

would be released and that it would be in a condition permitting subsequent survival	capture and survival.		
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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.			
<p>Since 2005 the Fisheries Administration has established a Scientific Observer Program, improving sampling coverage regarding some issues such as bycatch and fishing interactions with the ecosystem. This program enabled enhancement in training of observers with species identification and review of data collection processes. The first records of bycatch in Chilean purse seine fisheries were carried out occasionally by scientific observers from the “Program of Monitoring of Pelagic Fisheries of the Central South Zone” between 2009 and 2013.</p> <p>Since 2013, data have been collected by trained scientific observers from IFOP onboard commercial fishing vessels. During 2014, the “Program for research and monitoring of fishing discards and bycatch in pelagic fisheries” with a team of observers dedicated to the monitoring of purse seine artisanal fleets of anchovy and Araucanian herring fisheries that operated between the Valparaíso Region and the Los Lagos Region. From 2015 and onwards, data collection of bycatches of birds, mammals and turtles in fishing activities became a regular procedure.</p> <p>SUBPESCA through various research programs, has compiled information on discards and bycatch since 2013, their quantities and characteristics, and the causes that generate them. From 2017 onwards, SUBPESCA developed specific fishery reduction plans that incorporate conservation measures, technological tools, and codes of good practice to mitigate discards and incidental fishing.</p> <p>According with the provisions of Law No. 20,625/2012 and its regulation (D.S. Economía No. 76/2015), industrial and artisanal shipowners with a length equal to or greater than 15 m, must install and maintain in operation, throughout the fishing trip, an Image Recording Device (DRI), which allows detecting and recording any discarding action and incidental fishing (bycatch) that may occur on board. Artisanal fleets had 3 years to comply with D.S. Economía No. 76/2015 after its publication.</p> <p>IFOP (2021) provided information collected from January 2015 to December 2021 by scientific observers on commercial fishing trips within monitoring projects (annual monitoring) of the pelagic fisheries of the northern and south-central zones of Chile and within the research program of discards in pelagic fisheries. During the study period, there were incidental captures of 3,766 marine mammals (53.6%), 2,651 birds procellariiformes (37.7%) and 608 coastal seabirds (8.7%). 99.8% of mammalian bycatch was of common sea lion species. 6 specimens of killer whales (<i>Orcinus orca</i>) were identified. The main species of seabirds caught incidentally were sooty shearwater - <i>Ardenna grisea</i> (“fardela negra”, in Spanish), pink-footed shearwater – <i>Ardenna creatopus</i> (“fardela blanca”, in Spanish), Peruvian pelican - <i>Pelecanus thagus</i> (“pelicano peruviiano”, in Spanish), and Dominican gull - <i>Larus dominicanus</i> (“Gaviota dominicana”, in Spanish), representing 98.5% of the seabirds incidentally caught by this fleet. The incidental mortality mainly affected procellariiform birds (94.7%), followed by coastal seabirds (5.1%), while marine mammals only recorded 5 dead common sea lions (0.2%). The main species killed incidentally were the sooty shearwater and the pink-footed shearwater, which represented 92.5% of incidental mortality.</p>			
Interactions with ETP species are recorded. Sub-clause F1.1 is met.			
F1.2 There is no substantial evidence that the fishery has a significant negative effect on ETP species.			

No vulnerable species listed in national inventory of the Ministry of Environment of Chile or CITES category were detected on the anchovy and Araucanian herring fishery in south-central zones of Chile in 2021 (IFOP, 2021). Same situation was reported in 2020 by IFOP (2020).

The incidental catch in the south-central zone for the artisanal fishing of Araucanian herring fishery and anchovy, between 2015- 2021 was composed by 18 species or groups of species, being sooty shearwater and pink-footed shearwater the species with the highest mortality. pink-footed shearwater is listed as Vulnerable and sooty shearwater, as “Near threatened” by BirdLife International (2023).

pink-footed shearwaters predominately used the waters of Peru, Mexico, and the USA in nonbreeding period. Although purse-seine fisheries in Chile are a major source of pink-footed shearwater bycatch, Felis et al (2019) highlighted the lack of data from other countries where these birds are not monitored or observed for seabird bycatch. They also mentioned additional at-sea threats that may exist to pink-footed shearwaters during their non-breeding period, such as oil spills, chemical pollution, plastic ingestion, potential offshore energy development, and competition with fisheries. Thus, this fishery alone might not be the main cause of this bird vulnerable status.

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

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

Since 2005 the Fisheries Administration has established a Scientific Observer Program, improving sampling coverage regarding some issues such as bycatch and fishing interactions with the ecosystem. This program enabled enhancement in training of observers with species identification and review of data collection processes. The first records of bycatch in Chilean purse seine fisheries were carried out occasionally by scientific observers from the “Program of Monitoring of Pelagic Fisheries of the Central South Zone” between 2009 and 2013.

In September 2012, the Chilean government enacted Law No. 20,625, which amended the General Fisheries and Aquaculture Law. This law introduced the concept of incidental catch, or bycatch, of non-target sea turtles, seabirds, and marine mammals. It established control measures and sanctions for fisheries with bycatch and it was intended to provide legal recognition of bycatch, reduce bycatch levels in Chilean fisheries, and increase awareness of the need to incorporate bycatch into the management of fisheries under an ecosystem approach. The law also required the development of research programs to gather data for establishing fishery or gear-based bycatch reduction plans.

Since 2013, data have been collected by trained scientific observers from IFOP onboard commercial fishing vessels and it has been used to develop bycatch reduction plans for a number of fisheries in Chile. In 2014 the Scientific Observers Program was reformulated, aligning with the goals of new fishing regulations and reorienting it towards the research and monitoring of discards and bycatch in pelagic purse seine fisheries. During 2014, the “Program for research and monitoring of fishing discards and bycatch in pelagic fisheries” with a team of observers dedicated to the monitoring of purse seine artisanal fleets of anchovy and Araucanian herring fisheries that operated between the Valparaíso Region and the Los Lagos Region. From 2015 and onwards, data collection of bycatch of birds, mammals and turtles in fishing activities became a regular procedure.

The Chilean government requires all purse seine vessels to release ETP species that are accidentally caught. Vessels that are caught violating this regulation can be fined or even suspended from fishing. The Chilean government has set minimum mesh sizes for purse seine nets to prevent the accidental capture of small ETP species. Chile is a member of the Agreement of the Conservation of Albatrosses and Petrels and as such, it is committed to achieve and maintain a favourable conservation status of albatrosses and petrels.

Regarding main species killed incidentally, the birds sooty shearwater and the pink-footed shearwater, there are currently two mandatory resolutions that aim to reduce incidental capture of seabirds in Chilean fisheries (Resolution N° 2110/2014 and N° 2941/2019). They include the requirement of use of mitigation devices and other complementary actions (Best practices), however they are meant to longline, spinel and trawl fisheries.

The updated version of National Action Plan to Reduce Incidental Captures of Birds in the Longline Fisheries in Chile - (PAN-AM/Chile)", from 2007, is predicted to be published this year and according to SBWG11 (2023): "In the case of the purse seine fishery, there are still no official measures due the lack of background, specially missing information regarding efficient measures and practices accepted by the users, however, this Plan wanted to incorporate it to show the progress made in recent years and highlight the urgency of advancing on this issue."

In March 2022, Chile published a "Plan for the recovery, conservation and management of the pink-footed shearwater (*Ardenna creatopus*)". 10 lines of action were defined aimed to reduce marine threats that affect migration sites, to reduce terrestrial threats that affect nesting sites and increase knowledge and collaborative work for the protection of pink-footed shearwater and its habitat. Some of the measures include environmental education, define good practice manuals and measures to reduce incidental catches and mortality, monitoring, inspection, publish at least one mitigation measure for purse seine fishery, compile data of fishery interactions with feeding and migration zones, restoring nesting habitat, and promoting, adapting, and developing the necessary research for the conservation of the species and its habitats (BCN, 2022).

The fishery is known to interact with ETP species, measures are in place to minimise mortality. Therefore, sub-clause F1.3 is met.

References

BCN. 2022. Decreto 21. Aprueba plan de recuperación, conservación y gestión de la fardela blanca (*Ardenna creatopus*). Ministerio del Medio Ambiente. Biblioteca del Congreso Nacional del Chile. <https://www.bcn.cl/leychile/navegar?idNorma=1173524>

BirdLife International (2023) IUCN Red List for birds. Downloaded from <http://datazone.birdlife.org> on 20/07/2023.

D.S. Economía No. 76/2015 https://www.SUBPESCA.cl/portal/615/articles-96157_documento.pdf

Felis JJ, Adams J, Hodum PJ, Carle RD, Colodro V. Eastern Pacific migration strategies of Pink-footed Shearwaters *Ardenna creatopus*: Implications for fisheries interactions and international conservation. *Endanger Species Res.* 2019; 39: 269–282 <https://www.int-res.com/articles/esr2019/39/n039p269.pdf>

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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.

There is a management plan for anchovy and Araucanian herring fisheries, which includes a number of measures to protect the habitat of these species, such as the establishment of marine protected areas - MPAs in areas where anchovy and Araucanian herring are known to spawn. These MPAs are closed to fishing, which helps to protect the habitat of these species.

Annual temporal closures for the anchovy and Araucanian herring fisheries in V-X protects spawning stock and juveniles.

SERNAPESCA conducts research on the habitat needs of anchovy and Araucanian herring. This research is used to inform the management plan and to identify areas where additional measures may be needed to protect habitat.

SERNAPESCA consults with stakeholders, such as fishermen, scientists, and environmental groups, when making decisions about the management of anchovy and Araucanian herring fisheries. This helps to ensure that the needs of all stakeholders are considered and that the management plan is as effective as possible.

Therefore, **potential habitat interactions are considered in the management decision-making process. Subclause F2.1 is met.**

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

Purse seines are surface gears used in the marine coastal and high-sea waters, thus interactions of the fishing operations are not expected to occur with the seabed habitat (FAO, 2023). Moreover, there are many kinds of MPA established in Chile.

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

The gear 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.

The fishery is not known to interact with physical habitats and there are measures in place to minimise and mitigate negative impacts. Sub-clause F2.3 is met.

References

FAO. 2023. Fishing Gear types. Purse seines. Technology Fact Sheets. Fisheries and Aquaculture Division [online]. Rome. [Cited Thursday, July 20th 2023]. <https://www.fao.org/fishery/en/geartype/249/en>

Links

MarinTrust Standard clause	1.3.3.2
FAO CCRF	6.8
GSSI	D.2.07, D.6.07, D3.09

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

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

In 2013 the new Fishing and Aquaculture General Act (FAGA) was passed aiming the conservation and sustainable use of fisheries resources through the application of the precautionary approach and the Ecosystem-based Fisheries Management- EBFM. According to Porobic et al (2018) among the most notable changes with this Act were: “i) development of management plans (MP); ii) establishment of management committees (MC); iii) creation of technical scientific committees (TSC); iv) incorporation of regulations for bycatch; v) establishment of biological reference points (BRP); and vi) change in the responsibilities of the national fishing committee (NFC).”

In 2016, the Chilean government announced the creation of the governmental agency for climate change and sustainability, followed the approval of the climate change adaptation plan in fisheries and aquaculture in December 2015. This was a crucial milestone for Chile, given that climate change is predicted to exert a considerable influence on artisanal fisheries and small-scale aquaculture. These sectors face challenges due to their limited ability to adapt and restricted access to fishing resources and trade opportunities compared to larger industrial operations.

There is a management plan for the fishery and a plan for the reduction of discards and incidental catch for pelagic fisheries. Annual temporal closures for the anchovy and Araucanian herring fisheries in south-central Chile protects spawning stock and juveniles. There is TAC established for the fishery and it is reviewed and updated annually based on scientist recommendations, historical series of data and biannual surveys. For the recommendation of status and BAC of anchovy and Araucanian herring fisheries, CCT-PP use a statistical model with observations and dynamics in age, annual scale and biological year presented by IFOP and considers information of the biomass and age structure from acoustic cruises, total catches, age composition of the fleet, average weights and discards from the previous year.

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

The most likely mechanisms for the fishery to impact the ecosystem is through the removal of the target species; through impacts on non-target species & ETP species; and through physical impacts on marine habitats. These impacts are low for this fishery and there are measures in place to address these potential impacts.

Historically in the past years, in general, the fishing mortality levels of anchovy and Araucanian herring have been above the target reference level. In the last years, there has been an increase of the recruitment and biomass of the species. anchovy and Araucanian herring are the preferential prey of several high level trophic predators as marine mammals (dolphins, sea lion, seals), seabirds, larger fish (mackerel, sierra, hake, conger eels, cojinobas, sea bass) [SUBPESCA, 2016] and jumbo squid (Ibáñez et al., 2008). There has been observed an increase on jumbo squid, jurel, merluza landings in the past years (Sernapesca, 2023) and it was not found in the literature evidence that anchovy and Araucanian herring had a significant negative impact on their predators.

The fishery has a low impact on habitat as the gear is not in contact with the seabed.

The fishery has a low catch of non-target or ETP species.

There is no substantial evidence that the fishery has 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.

Anchovy and Araucanian herring are small pelagics, occupying medium trophic levels and playing the general role on transferring the flow of energy from plankton to predators of higher trophic level, being called “wasp waist” control. Anchovy and Araucanian herring are preferential prey of several high-level trophic predators as marine mammals (dolphins, sea lion, seals), seabirds, larger fish (mackerel, sierra, hake, conger eels, cojinobas, sea bass) [SUBPESCA, 2016] and jumbo squid (Ibáñez et al., 2008). These animals are usually accompanying fauna of anchovy and Araucanian herring and there are regulations for their discards, including a plan for the reduction of discards and incidental catch for pelagic fisheries, and monitoring programs which provides information of this species. The Chilean government requires all purse seine vessels to release ETP species that are accidentally caught and has set minimum mesh sizes for purse seine nets to prevent. For the recommendation of status and BAC of anchovy and Araucanian herring fisheries, CCT-PP use several biological indications, including data of discards and establishes a joint imputation of quotas for anchovy and Araucanian herring between the Regions of Valparaíso to Los Lagos, considering that these species belong to the same trophic level, thus having the same role in the ecosystem.

Additional precaution is included in recommendations relating to the total permissible fishery removals. Thus sub-clause F3.3 is met.

References

Ibáñez C, Arancibia H, Cubillos L. 2008. Biases in determining the diet of jumbo squid *Dosidicus gigas* (D’Orbigny 1835) (Cephalopoda: Ommastrephidae) off southern-central Chile (34°S–40°S). *Helgol Mar Res* 62: 331–338

<https://hmr.biomedcentral.com/articles/10.1007/s10152-008-0120-0>

Porobic et al (2018): Porobic, J., Fulton, E. A., Frusher, S., Parada, C., Haward, M., Ernst, B., & Stram, D. (2018). Implementing Ecosystem-based Fisheries Management: lessons from Chile's experience. *Marine Policy*, 97, 82-90.

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SERNAPESCA. 2023. Anuario Estadístico de Pesca y Acuicultura. Chile. Desembarque total por especie y región.

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SUBPESCA. 2016. Plan de manejo para la pesquería de sardina común y anchovy V a la X regiones.

https://www.SUBPESCA.cl/portal/616/articles-94523_documento.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 r_m . 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	Wholefish Assessment Chilean anchovy (<i>Engraulis ringens</i>) and Araucanian herring (<i>Strangomera bentincki</i>) FAO 87, Chilean EEZ Regions V-X
Management authority (Country/State)	Chile Undersecretary for Fisheries and Aquaculture (SUBPESCA)
Main species	Anchovy (<i>Engraulis ringens</i>) Araucanian herring (<i>Strangomera bentincki</i>) Mote sculpin (<i>Normanichthys crockeri</i>)
Fishery location	FAO 87 Pacific Southeast, Chile EEZ, Regions V to X
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.

*Several comments are made throughout referring to evidence which may be supportive in substantiating the assessment outcome.

M2.4: By catch reduction methods
M2.4 Evidence of the outcome of control programs for 2022 – no. of sanctions and in what areas of non-compliance
3A(A.3.3) Comment referring to 2024 surveillance
Table D: A note to clarify the Fecundity score of 2 and not 1.
3F.(F1.3) Any further evidence to substantiate specific measures to mitigate interactions with the vulnerable and near threatened bird species encountered.

F3.3. Note to reference the role of ecosystems-based fishery management in establishing BAC's.

General Comments on the Draft Report provided to the peer reviewer

The peer reviewer has commented in several places referring to evidence contained in figures and tables which is helpful for easy referencing the data.

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?
The scoring is consistent with the MT standard and the appropriate evidence is provided within the assessment report.
Certification body response
OK

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 guidance. Comments and notes for possible clarification are added (see specific sections below).

An internal review of the assessment has been conducted by the CB and agrees with the findings of the assessment. Additional comments have been left in the report by the CB assessors which is helpful to demonstrate there has been dialogue on the best approach for assessing the minor species, mote sculpin as a Cat D. species.

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?

The species categorisation section (see Table 5) indicates the catch composition is made up of 48% Anchovy (*Engraulis ringens*) and 50% Araucanian herring (*Strangomera bentincki*) and 2% Mote sculpin (*Normanichthys crockeri*). The assessor has based the categorisation on data from the artisanal fishery, providing the majority of landings to the processing plants, and the % catch composition based on landings to the Biobio region extracted from the report “Programa de investigación y monitoreo del descarte y la captura de pesca incidental en pesquerías pelágicas, 2021-2022” – IFOP (2022^{2b}), published in November 2022. This represents the most updated information available.

Figure 3 provides the landings across all regions and also figure 6. Mote sculpin estimated catch was 10.41t and based on 40 set hauls (2021) estimated at ~3% of catch composition. This reflects the best current understanding of the catch composition of the fishery. The assessor identifies a 2% catch composition for mote sculpin for 2022 based on Biobio region.

It may be worth a note to clarify the 2% (compared to 3%) chosen, possibly reflecting total catch composition for 2022 across all regions?

Certification body response

The percentage of each species was based on raw number of catches of the species selected for the assessment (anchovy, Araucanian herring and mote sculpin) provided by the report “Programa de investigación y monitoreo del descarte y la captura de pesca incidental en pesquerías pelágicas, 2021-2022” – IFOP. I summed the catches of each species of the assessment in each region and disregarded the species that were not included in the assessment. Then, I provided an average of the catches for each of the selected species and compared with the sum of them to come with a percentage:

	Anchovy	Araucanian herring	Mote sculpin
Bilbío	192.880,10	166.955	10.414
Los Ríos	5.652,40	40.697,60	
Total per species	198.532,50	207.652,60	10.414
Total catches	416.599,10		
Percentage (Total catches/Total per species)	48%	50%	2%

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3M. Are the scores in “Section M – Management” clearly justified?	
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The scores in this section are evidenced by the available information and are justified.

Comments:

In section M2.4 the assessor notes that there is a plan for reduction of the bycatches, which includes work of scientific observers in commercial expeditions. It may be noteworthy to add any details available of bycatch reduction methods and for what species.

Also that 6 control programs were developed... *A total of 6 special control programs were developed at national level, summed with the ongoing control activities at regional level and others general controls. 92,851 total activities were developed in 2022, 39.8% of the total national effort was focused in Biobío region. 51.3% of the national inspections were for quota control, 21.1% to access control (authorizations), 15.1% to control of closed seasons and 7% to the accreditation of legal origin.*

The report could reference any evidence of the outcome of the control programs such as ‘% sanctions in specific areas of non-compliance (noting that in the 2021 MT surveillance report ‘ In the 2021 annual report the more frequent non-compliance reported in this fishery was the access to closed areas’).

Certification body response

This information was added to the report:

“According to SERNAPESCA (2022), regarding to complaints to courts in which the SERNAPESCA, the regions of Los Lagos with 17.9%, Coquimbo (10.5%) and Antofagasta (9.5%) are the ones that register a higher proportion of complaints in 2022. The most frequently detected breaches in 2022 were associated with contravening associated provisions referring to the Proof of Legal Origin (22.6%) and catches during closed season, with 12.6%. Regarding to complains associated to specific species, only 3.8% of the complains included anchovy. 93 violations that came to judgment sentencing executed, 35,5% were in Los Lagos, 10,8 % in Biobío and 6,5% in Valparaíso. In addition to the complaints in court, a total of 20 sanctioning resolutions of an administrative nature initiated in 2022, in which the competent body is the National Service of Fisheries and Aquaculture.

There is a plan for reduction of the bycatches, authorized by exempt resolution No. 2,463 of 2017, and other resolutions, which included work of scientific observers in commercial expeditions, spatial and temporal closures of fisheries when the incidence of juveniles is high or when it exceeds the limit of accompanying fauna and others.”

Mitigation Measures (MM) / Good Practices (BP)	Regulations	Quantifiable	Enforces	Associated causes
Joint imputation of the catch of anchovy and Araucanian herring between the Regions of Valparaíso to Los Lagos, will amount to a 70% of the sum of effective quotas of the aforementioned resources, in a 1 to 1 ratio, where the composition of the landing corresponds to a mixed fishery, in which Araucanian herring is the dominant species with respect to anchovy. I modify the joint imputation of Araucanian herring and anchovy, of 40% (D.Ex.No.87/2020). (MM)	R.Ex.N°.2463/2017 R.Pesq.N°.95/2017 D.Ex.No.87/2020, modifies D.Ex.No.87-2020	No	Yes	2) Exceeding the permitted limit of accompanying fauna 5) Catches of closed species 9) Catches of non-commercial species 14) Exceeds fishing quota or LMCA 17) Without tradable fishing license 18) Cast with little fishing
Establishment of space-time closures based on information in real time when the percentage of juveniles was high (MM recommendation)	R.Ex.N°.2463/2017 R.Pesq.N°.95/2017	Yes	No	10) Capture of specimens under commercial size
Establishment of space-time closures in real time when areas with the presence of prohibited species are observed or with a limited landing percentage (Recommendations of mm) Protocol "move on" according to R.Ex.No.5559/2018	R.Ex.N°.2463/2017 R.Pesq.N°.95/2017 D.Ex.N°.45/2020 R.Ex.N°.46/2022	Yes	No	2) Exceeding the permitted limit of accompanying fauna 3) Capture of unauthorized species (without fishing permit) 9) Catches of non-commercial species
It is allowed for both fleets (artisanal and industrial), the transfer catch that cannot be brought on board due to limitations in the warehouse capacity (MM, Subsequently implemented through of the R.Ex.No.862/2021).	R.Ex.N°.2463/2017 (Subpesca, 2017b) R.Pesq.N°.95/2017 (Subpesca, 2017a) (Subpesca, 2021b)	Yes	Yes	11) Exceeds warehouse capacity 12) Exceeds operating capacity or security considerations (tacked)
Do not perform draft when there is little volume available in the cellar (BP)	R.Ex.N°.2463/2017 R.Pesq.N°.95/2017 R.Ex.N°.862/2021	No	No	11) Exceeds warehouse capacity

FIGURE 17. MITIGATION MEASURES AND GOOD PRACTICE RECOMMENDATIONS FOR THE INDUSTRIAL AND ARTISANAL PURSE SEINE FISHERY FOR ARAUCANIAN AND ANCHOVY OF THE CENTRAL SOUTH ZONE OF CHILE. TABLE ADAPTED FROM TABLE 11 OF IFOP (2022).

References:

IFOP. 2022. Programa de observadores científicos: Programa de investigación y monitoreo del descarte y de la captura de pesca incidental en pesquerías pelágicas, año 2021-2022. INFORME FINAL. Convenio de Desempeño 2021. https://www.ifop.cl/wp-content/uploads/RepositorioIfop/InformeFinal/2022/P-581180_mejorado.pdf

3A. Are the “Category A Species” scores clearly justified?

The scores in this section are justified by the assessor with useful figures and tables presented. The following observations/comments are made:

Anchovy (*Engraulis ringens*)

A2.3 The assessor notes that the stock assessment considers an estimate of 2% discard rate. Noting that the observed data from Biobío Region (2021) a total catch of 192,880t was estimated with a discard equivalent to 10.4%, the assessor may wish to make a note of the difference between the two estimates and referring to (A.4.1) ‘the stock is maintained in a state of full exploitation’.

Araucanian herring, *Strangomera bentincki*

A3.3 The assessor notes that Chile is establishing a new dynamic and flexible closure mechanism (Comité de manejo anchovy y Sardina común, 2023) for anchovy and Araucanian herring fishery. The mechanism is described as an improvement to the current process, eliminating the rigidity of fixed periods and that the new proposal will consider biological data updated through the year.

Also that CCT-PP has been discussed the need to reduce the BAC range for 2023 considering the current status of overexploitation of Araucanian herring (CCT-PP, 2023).

Given, that the 2022 surveillance report noted that overfishing had occurred (SSB was below 40 % from the target biomass reference point SSBMSY and Fishing mortality (F=0.33) was 11% above the FMSY).

The surveillance audit in 2024 should review evidence of implementation of the new closure mechanism and an update to the stock status of Araucanian herring.

Certification body response

A2.3 In 2021, the discards in Bilbio were 10.4%. The stock assessment does not clarify the reasons for considering 2% of discards, it might be an estimate for the 2023 year considering historical data for the region. I added on the section the information that this rate it is based on 2023 year. The only information about this on the stock assessment report is: "Consequently, discounting to this catch a 2% discard for the year 2023, it is determines a maximum CBA of 178,677 t and a range between 142,942 to 178,677 t."

A3.3. Agreed.

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

No Category B species were identified.

Certification body response

OK

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

No Category B species were identified.

Certification body response

OK

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

The assessor has correctly identified mote sculpin (*Normanichthys crockery*) as a Cat D species, with estimated landings of <5% and the stock not subject to formal management. As there is insufficient evidence (e.g.fishbase) to fulfil all the requirements of Cat D Productivity/Susceptibility Analysis, the assessor has based the scores on anchovy and Araucanian herring, marking these with an asterisk, noting that Landaeta et al (2010) have used a similar hypothesis for their study with larval growth and hatch dates of early stages of the mote sculpin. This appears to be a logical approach and follows the guidance provided by MT.

Referring to Fecundity:
 Fecundity (eggs/spawning) 50,000 -200,000* 2. The range would qualify for a score of 1 (lower risk) and the assessor may be exercising precaution and assigning a higher risk score. The outcome of the analysis has correctly determined the stock as not vulnerable and Table D4 is not applicable.

Certification body response

It was a mistake on the fecundity score, I have corrected from 2 to 1.

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

The main species of seabirds caught incidentally were Sooty Shearwater, Pink-footed Shearwater, Peruvian pelican, and Dominican gull, representing 98.5% of the seabirds incidentally caught by this fleet. The incidental mortality mainly affected procellariform birds (94.7%), followed by coastal seabirds (5.1%), while marine mammals only recorded 5 dead common sea lions (0.2%).

Noting that the main species killed incidentally were the Sooty Shearwater and the Pink-footed Shearwater, which represented 92.5% of incidental mortality and that Pink-footed Shearwater is listed as ‘Vulnerable’ and Sooty Shearwater, as ‘Near threatened’ by BirdLife International (2023)/IUCN.

The assessor notes from Felis et al (2019) that there is a lack of evidence of other impacts on these species across their full distribution and hence, the anchovy & Arucanian herring may not be the only or the most significant impact in response to F1.2.

It may be useful to place further context on the available information regarding population trends of the species.

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

Given the vulnerable and near threatened status of these species, it would be useful to place further context of **any specific measures** in place to avoid interactions with these species and minimise mortality during fishing events?

Referring to 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.

The assessor may wish to note further evidence of the application and progress made of the Ecosystem-based Fisheries Management (EBFM) concept, which has been integrated into the new Chilean Fisheries for establishing the BAC.

Certification body response

I could not find recent publications of population trends for Pink-footed Shearwater neither Sooty Shearwater. Latest publications are from 2013 and BirdLife International (2023)/IUCN reports these species as “Population trend – unknown”.

This information was added to F1.3:

“There are currently two mandatory resolutions that aim to reduce incidental capture of seabirds in Chilean fisheries (Resolution N° 2110/2014 and N° 2941/2019). They include the requirement of use of mitigation devices and other complementary actions (Best practices), however they are meant to longline, spinel and trawl fisheries.

The updated version of National Action Plan to Reduce Incidental Captures of Birds in the Longline Fisheries in Chile - (PAN-AM/Chile)”, from 2007, is predicted to be published this year and according to SBWG11 (2023): “In the case of the purse seine fishery, there are still no official measures due the lack of background, specially missing information regarding efficient measures and practices accepted by the users, however, this Plan wanted to incorporate it to show the progress made in recent years and highlight the urgency of advancing on this issue.”.

In March 2022, Chile published a “Plan for the recovery, conservation and management of the pink-footed shearwater (*Ardenna creatopus*)”. 10 lines of action were defined aimed to reduce marine threats that affect migration sites, to reduce terrestrial threats that affect nesting sites and increase knowledge and collaborative work for the protection of pink-footed shearwater and its habitat. Some of the measures include environmental education, define good practice manuals and measures to reduce incidental catches and mortality, monitoring, inspection, publish at least one mitigation measure for purse seine fishery, compile data of fishery interactions with feeding and migration zones, restoring nesting habitat, and promoting, adapting, and developing the necessary research for the conservation of the species and its habitats (BCN, 2022).”

I added a phrase to the end of F.3.3: “For the recommendation of status and BAC of anchovy and Araucanian herring fisheries, CCT-PP use several biological indications, including data of discards and establishes a joint imputation of quotas for anchovy and Araucanian herring between the Regions of Valparaíso to Los Lagos, considering that these species belong to the same trophic level, thus having the same role in the ecosystem.”.

References

BCN. 2022. Decreto 21. Aprueba plan de recuperación, conservación y gestión de la fardela blanca (*Ardenna creatopus*). Ministerio del Medio Ambiente. Biblioteca del Congreso Nacional del Chile. <https://www.bcn.cl/leychile/navegar?idNorma=1173524>

SBWG11. 2023. Eleventh Meeting of the Seabird Bycatch Working Group. Actualización Plan de acción Nacional para reducir las capturas incidentales de aves marinas en Chile (PAN-AM/Chile). Seabird Bycatch Working Group. https://www.bmis-bycatch.org/system/files/zotero_attachments/library_1/BMJKDSVN%20-%202023%20-%20.pdf

Optional: General comments on the Peer Review Draft Report

Notwithstanding, the comments raised, the report provides a good level of updated references specific to the fisheries to support the evaluation.

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)

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	Wholefish Assessment Chilean anchovy (<i>Engraulis ringens</i>) and Araucanian herring (<i>Strangomera bentincki</i>) FAO 87, Chilean EEZ Regions V-X
Management authority (Country/State)	Chile Undersecretary for Fisheries and Aquaculture (SUBPESCA)
Main species	Anchovy (<i>Engraulis ringens</i>) Araucanian herring (<i>Strangomera bentincki</i>) Mote sculpin (<i>Normanichthys crockeri</i>)
Fishery location	FAO 87 Pacific Southeast, Chile EEZ, Regions V to X
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.

*Several comments are made throughout referring to evidence which may be supportive in substantiating the assessment outcome.

M2.4: By catch reduction methods

M2.4 Evidence of the outcome of control programs for 2022 – no. of sanctions and in what areas of non-compliance

3A(A.3.3) Comment referring to 2024 surveillance

Table D: A note to clarify the Fecundity score of 2 and not 1.

3F.(F1.3) Any further evidence to substantiate specific measures to mitigate interactions with the vulnerable and near threatened bird species encountered.

F3.3. Note to reference the role of ecosystems-based fishery management in establishing BAC's.

General Comments on the Draft Report provided to the peer reviewer

The peer reviewer has commented in several places referring to evidence contained in figures and tables which is helpful for easy referencing the data.

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?
The scoring is consistent with the MT standard and the appropriate evidence is provided within the assessment report.
Certification body response
OK

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 guidance.
Comments and notes for possible clarification are added (see specific sections below).

An internal review of the assessment has been conducted by the CB and agrees with the findings of the assessment. Additional comments have been left in the report by the CB assessors which is helpful to demonstrate there has been dialogue on the best approach for assessing the minor species, mote sculpin as a Cat D. species.

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?

The species categorisation section (see Table 5) indicates the catch composition is made up of 48% Anchovy (*Engraulis ringens*) and 50% Araucanian herring (*Strangomera bentincki*) and 2% Mote sculpin (*Normanichthys crockeri*). The assessor has based the categorisation on data from the artisanal fishery, providing the majority of landings to the processing plants, and the % catch composition based on landings to the Biobio region extracted from the report “Programa de investigación y monitoreo del descarte y la captura de pesca incidental en pesquerías pelágicas, 2021-2022” – IFOP (2022²b), published in November 2022. This represents the most updated information available.

Figure 3 provides the landings across all regions and also figure 6. Mote sculpin estimated catch was 10.41t and based on 40 set hauls (2021) estimated at ~3% of catch composition. This reflects the best current understanding of the catch composition of the fishery. The assessor identifies a 2% catch composition for mote sculpin for 2022 based on Biobio region.

It may be worth a note to clarify the 2% (compared to 3%) chosen, possibly reflecting total catch composition for 2022 across all regions?

Certification body response

The percentage of each species was based on raw number of catches of the species selected for the assessment (anchovy, Araucanian herring and mote sculpin) provided by the report “Programa de investigación y monitoreo del descarte y la captura de pesca incidental en pesquerías pelágicas, 2021-2022” – IFOP. I summed the catches of each species of the assessment in each region and disregarded the species that were not included in the assessment. Then, I provided an average of the catches for each of the selected species and compared with the sum of them to come with a percentage:

	Anchovy	Araucanian herring	Mote sculpin
Bilbío	192.880,10	166.955	10.414
Los Ríos	5.652,40	40.697,60	
Total per species	198.532,50	207.652,60	10.414
Total catches	416.599,10		
Percentage (Total catches/Total per species)	48%	50%	2%

3M. Are the scores in “Section M – Management” clearly justified?

The scores in this section are evidenced by the available information and are justified.

Comments:

In section M2.4 the assessor notes that there is a plan for reduction of the bycatches, which includes work of scientific observers in commercial expeditions. It may be noteworthy to add any details available of bycatch reduction methods and for what species.

Also that 6 control programs were developed... *A total of 6 special control programs were developed at national level, summed with the ongoing control activities at regional level and others general controls. 92,851 total activities were developed in 2022, 39.8% of the total national effort was focused in Biobío region. 51.3% of the national inspections were for quota control, 21.1% to access control (authorizations), 15.1% to control of closed seasons and 7% to the accreditation of legal origin.*

The report could reference any evidence of the outcome of the control programs such as ‘% sanctions in specific areas of non-compliance (noting that in the 2021 MT surveillance report ‘ In the 2021 annual report the more frequent non-compliance reported in this fishery was the access to closed areas’).

Certification body response

This information was added to the report:

“According to SERNAPESCA (2022), regarding to complaints to courts in which the SERNAPESCA, the regions of Los Lagos with 17.9%, Coquimbo (10.5%) and Antofagasta (9.5%) are the ones that register a higher proportion of complaints in 2022. The most frequently detected breaches in 2022 were associated with contravening associated provisions referring to the Proof of Legal Origin (22.6%) and catches during closed season, with 12.6%. Regarding to complains associated to specific species, only 3.8% of the complains included anchovy. 93 violations that came to judgment sentencing executed, 35,5% were in Los Lagos, 10,8 % in Biobío and 6,5% in Valparaíso. In addition to the complaints in court, a total of 20 sanctioning resolutions of an administrative nature initiated in 2022, in which the competent body is the National Service of Fisheries and Aquaculture.

There is a plan for reduction of the bycatches, authorized by exempt resolution No. 2,463 of 2017, and other resolutions, which included work of scientific observers in commercial expeditions, spatial and temporal closures of fisheries when the incidence of juveniles is high or when it exceeds the limit of accompanying fauna and others.”

Mitigation Measures (MM) / Good Practices (BP)	Regulations	Quantifiable	Enforces	Associated causes
Joint imputation of the catch of anchovy and Araucanian herring between the Regions of Valparaiso to Los Lagos, will amount to a 70% of the sum of effective quotas of the aforementioned resources, in a 1 to 1 ratio, where the composition of the landing corresponds to a mixed fishery, in which Araucanian herring is the dominant species with respect to anchovy. I modify the joint imputation of Araucanian herring and anchovy, of 40% (D.Ex.No. 87/2020). (MM)	R.Ex.N°. 2463/2017 R.Pesq.N°. 95/2017 D.Ex.No. 87/2020, modifies D.Ex.No. 87-2020	No	Yes	2) Exceeding the permitted limit of accompanying fauna 5) Catches of closed species 9) Catches of non-commercial species 14) Exceeds fishing quota or LMCA 17) Without tradable fishing license 18) Cast with little fishing
Establishment of space-time closures based on information in real time when the percentage of juveniles was high (MM recommendation)	R.Ex.N°. 2463/2017 R.Pesq.N°. 95/2017	Yes	No	10) Capture of specimens under commercial size
Establishment of space-time closures in real time when areas with the presence of prohibited species are observed or with a limited landing percentage (Recommendations of mm) Protocol "move on" according to R.Ex.No.5559/2018	R.Ex.N°. 2463/2017 R.Pesq.N°. 95/2017 D.Ex.N°. 45/2020 R.Ex.N°. 46/2022	Yes	No	2) Exceeding the permitted limit of accompanying fauna 3) Capture of unauthorized species (without fishing permit) 9) Catches of non-commercial species
It is allowed for both fleets (artisanal and industrial), the transfer catch that cannot be brought on board due to limitations in the warehouse capacity (MM, Subsequently implemented through of the R.Ex.No. 862/2021).	R.Ex.N°. 2463/2017 (Subpesca, 2017b) R.Pesq.N°. 95/2017 (Subpesca, 2017a) (Subpesca, 2021b)	Yes	Yes	11) Exceeds warehouse capacity 12) Exceeds operating capacity or security considerations (tacked)
Do not perform draft when there is little volume available in the cellar (BP)	R.Ex.N°. 2463/2017 R.Pesq.N°. 95/2017 R.Ex.N°. 862/2021	No	No	11) Exceeds warehouse capacity

Figure 1. Mitigation measures and good practice recommendations for the industrial and artisanal purse seine fishery for Araucanian and anchovy of the central south zone of Chile. Table adapted from Table 11 of IFOP (2022).

References:

IFOP. 2022. Programa de observadores científicos: Programa de investigación y monitoreo del descarte y de la captura de pesca incidental en pesquerías pelágicas, año 2021-2022. INFORME FINAL. Convenio de Desempeño 2021. https://www.ifop.cl/wp-content/uploads/RepositorioIfop/InformeFinal/2022/P-581180_mejorado.pdf

3A. Are the “Category A Species” scores clearly justified?

The scores in this section are justified by the assessor with useful figures and tables presented. The following observations/comments are made:

Anchovy (*Engraulis ringens*)

A2.3 The assessor notes that the stock assessment considers an estimate of 2% discard rate. Noting that the observed data from Biobio Region (2021) a total catch of 192,880t was estimated with a discard equivalent to 10.4%, the assessor may wish to make a note of the difference between the two estimates and referring to (A.4.1) ‘the stock is maintained in a state of full exploitation’.

Araucanian herring, *Strangomera bentincki*

A3.3 The assessor notes that Chile is establishing a new dynamic and flexible closure mechanism (Comité de manejo anchovy y Sardina común, 2023) for anchovy and Araucanian herring fishery. The

mechanism is described as an improvement to the current process, eliminating the rigidity of fixed periods and that the new proposal will consider biological data updated through the year. Also that CCT-PP has been discussed the need to reduce the BAC range for 2023 considering the current status of overexploitation of Araucanian herring (CCT-PP, 2023). Given, that the 2022 surveillance report noted that overfishing had occurred (SSB was below 40 % from the target biomass reference point SSBMSY and Fishing mortality (F=0.33) was 11% above the FMSY). The surveillance audit in 2024 should review evidence of implementation of the new closure mechanism and an update to the stock status of Araucanian herring.

Certification body response

A2.3 In 2021, the discards in Bilbio were 10.4%. The stock assessment does not clarify the reasons for considering 2% of discards, it might be an estimate for the 2023 year considering historical data for the region. I added on the section the information that this rate it is based on 2023 year. The only information about this on the stock assessment report is: "Consequently, discounting to this catch a 2% discard for the year 2023, it is determines a maximum CBA of 178,677 t and a range between 142,942 to 178,677 t."

A3.3. Agreed.

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

No Category B species were identified.

Certification body response

OK

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

No Category B species were identified.

Certification body response

OK

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

The assessor has correctly identified mote sculpin (*Normanichthys crockery*) as a Cat D species, with estimated landings of <5% and the stock not subject to formal management. As there is insufficient evidence (e.g.fishbase) to fulfil all the requirements of Cat D Productivity/Susceptibility Analysis, the assessor has based the scores on anchovy and Araucanian herring, marking these with an asterisk, noting that Landaeta et al (2010) have used a similar hypothesis for their study with larval growth and hatch dates of early stages of the mote sculpin. This appears to be a logical approach and follows the guidance provided by MT.

Referring to Fecundity:

Fecundity (eggs/spawning) 50,000 -200,000* 2. The range would qualify for a score of 1 (lower risk) and the assessor may be exercising precaution and assigning a higher risk score.

The outcome of the analysis has correctly determined the stock as not vulnerable and Table D4 is not applicable.

Certification body response

It was a mistake on the fecundity score, I have corrected from 2 to 1.

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

The main species of seabirds caught incidentally were Sooty Shearwater, Pink-footed Shearwater, Peruvian pelican, and Dominican gull, representing 98.5% of the seabirds incidentally caught by this fleet. The incidental mortality mainly affected procellariform birds (94.7%), followed by coastal seabirds (5.1%), while marine mammals only recorded 5 dead common sea lions (0.2%).

Noting that the main species killed incidentally were the Sooty Shearwater and the Pink-footed Shearwater, which represented 92.5% of incidental mortality and that Pink-footed Shearwater is listed as ‘Vulnerable’ and Sooty Shearwater, as ‘Near threatened’ by BirdLife International (2023)/IUCN.

The assessor notes from Felis et al (2019) that there is a lack of evidence of other impacts on these species across their full distribution and hence, the anchovy & Arucanian herring may not be the only or the most significant impact in response to F1.2.

It may be useful to place further context on the available information regarding population trends of the species.

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

Given the vulnerable and near threatened status of these species, it would be useful to place further context of **any specific measures** in place to avoid interactions with these species and minimise mortality during fishing events?

Referring to 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.

The assessor may wish to note further evidence of the application and progress made of the Ecosystem-based Fisheries Management (EBFM) concept, which has been integrated into the new Chilean Fisheries for establishing the BAC.

Certification body response

I could not find recent publications of population trends for Pink-footed Shearwater neither Sooty Shearwater. Latest publications are from 2013 and BirdLife International (2023)/IUCN reports these species as “Population trend – unknown”.

This information was added to F1.3:

“There are currently two mandatory resolutions that aim to reduce incidental capture of seabirds in Chilean fisheries (Resolution N° 2110/2014 and N° 2941/2019). They include the requirement of use of mitigation devices and other complementary actions (Best practices), however they are meant to longline, spinel and trawl fisheries.

The updated version of National Action Plan to Reduce Incidental Captures of Birds in the Longline Fisheries in Chile - (PAN-AM/Chile)”, from 2007, is predicted to be published this year and according to SBWG11 (2023): “In the case of the purse seine fishery, there are still no official measures due the lack of background, specially missing information regarding efficient measures and practices accepted by the users, however, this Plan wanted to incorporate it to show the progress made in recent years and highlight the urgency of advancing on this issue.”.

In March 2022, Chile published a “Plan for the recovery, conservation and management of the pink-footed shearwater (*Ardenna creatopus*)”. 10 lines of action were defined aimed to reduce marine threats that affect migration sites, to reduce terrestrial threats that affect nesting sites and increase knowledge and collaborative work for the protection of pink-footed shearwater and its habitat. Some of the measures include environmental education, define good practice manuals and measures to reduce incidental catches and mortality, monitoring, inspection, publish at least one mitigation measure for purse seine fishery, compile data of fishery interactions with feeding and migration zones, restoring nesting habitat, and promoting, adapting, and developing the necessary research for the conservation of the species and its habitats (BCN, 2022).”

I added a phrase to the end of F.3.3: “For the recommendation of status and BAC of anchovy and Araucanian herring fisheries, CCT-PP use several biological indications, including data of discards and establishes a joint imputation of quotas for anchovy and Araucanian herring between the Regions of Valparaíso to Los Lagos, considering that these species belong to the same trophic level, thus having the same role in the ecosystem.”.

References

BCN. 2022. Decreto 21. Aprueba plan de recuperación, conservación y gestión de la fardela blanca (*Ardenna creatopus*). Ministerio del Medio Ambiente. Biblioteca del Congreso Nacional del Chile. <https://www.bcn.cl/leychile/navegar?idNorma=1173524>

SBWG11. 2023. Eleventh Meeting of the Seabird Bycatch Working Group. Actualización Plan de acción Nacional para reducir las capturas incidentales de aves marinas en Chile (PAN-AM/Chile). Seabird Bycatch Working Group. https://www.bmis-bycatch.org/system/files/zotero_attachments/library_1/BMJKDSVN%20-%202023%20-%20.pdf

Optional: General comments on the Peer Review Draft Report

Notwithstanding, the comments raised, the report provides a good level of updated references specific to the fisheries to support the evaluation.

Certification body response