MarinTrust Whole fish fishery

assessment report

Panama – Pacific Anchoveta (Cetengraulis mysticetus) and Pacific Thread Herring (Opisthonema spp.) – FAO 77

Reapproval
WF20

Table 1: Whole fish fishery assessment scope

Fishery name	**Panama – Pacific Anchoveta (Cetengraulis mysticetus) and Pacific Thread Herring (Opisthonema spp.) – FAO 77**
MarinTrust report code	**WF20**
Type 1 species	*Pacific anchoveta (Cetengraulis mysticetus)* *Pacific thread herring (Opisthonema spp.)* *(note: it is a complex of at least 3 different species)*
Fishery location	*Area FAO 77, Eastern Central Pacific, Panama (Gulf of Panama)*
Gear type(s)	*Purse seine*
Management authority	*Aquatic Resources Authority of Panama* *(Autoridad de los Recursos Acuáticos de Panamá - ARAP)* *Panamá*

Table 2: Applicant and Certification Body details

Application details			
Applicant(s)		*Promarina SA, Procesadora Bayano SA*	
Applicant country		*Panama*	
Certification Body details			
Name of Certification Body		NSF / Global Trust Certification Ltd	
Contact Information for CB		Fisheries@nsf.org	
Fishery Assessor name		Ana Elisa Almeida Ayres	
CB Peer Reviewer name		Matthew Jew	
Number of assessment days	4	**Assessment period**	04/2025 to 04/2026

Table 3: Assessment outcome

Assessment outcome (See Table 4 for a summary of assessment determination)		*Approve*
Approval validity	Valid from: *04/2025*	Valid until: *04/2026*
CB peer reviewer evaluation		*Agree with assessment determination*
Fishery Assessment Peer Review Group external peer reviewer evaluation		*Agree with assessment determination*

Table 4: Assessment determination

Assessment determination **Summary of assessment and outcome**
The small pelagic fishery in Panamá targets Pacific anchoveta (*Cetengraulis mysticetus*) and thread herrings (*Opisthonema* spp.), which usually represents more 95% of the catch, with relatively low catches of several other species. Thread herring represents a complex of three species (*Opisthonema libertate, O. medirastre and O. bulleri*) that are target together in Panamanian waters and treated as a single unit by the authorities for assessment and management purposes. In the last private on-board observer report, bycatch composition from the 2024 fishing season composed about 1.6% of the catches, represented mainly by Mexican barracuda/*barracuda gigante (Sphyraena ensis*), Peruvian mojarra/*Palomillo aleta amarilla (Diapterus peruvianus/brevirostris),* Pacific bumper/*orqueta (Chloroscombrus orqueta*), hairfin lookdown/j*orobado antena (Selene brevoortii*), Panama longfin herring/*sardina machete (Odontognathus panamensis*) and white mullet/*lisa (Mugil curema*). The small pelagic fishery in Panama is managed by the Aquatic Resources Authority of Panama (*Autoridad de los Recursos Acuáticos de Panamá*, ARAP). ARAP is also the body responsible for the data collection and analysis of fisheries resources in Panama. There is a management plan for small pelagics in place in Panama since 2018. The ARAP's Directorate of Inspection, Surveillance and Control is responsible for monitoring compliance with fishery laws and regulations. Pacific anchoveta and thread herrings were initially assessed under Category A using the most recent stock assessment provided by the MarinTrust applicant, based on 2023 data, and using biomass data from the hydroacoustic cruise performed in March 2025. In 2020, the assessment of the Panamanian pelagic fishery was reviewed by Minte-Vera 2021. The 2024 stock assessment used recommendations from Minte-Vera 2021. The target reference point for the biomass has been determined as a spawning biomass equal to 60% of the virgin spawning biomass. Cristian Canales Ramirez clarified by email to the assessment team that it has been considered a Blim=50%BMSY; Blim = 0.3 x B0 for Pacific anchoveta and thread herring in the last stock assessment. The main mechanisms by which total removals are currently restricted are seasonal closures and restrictions on total fishing licences. The decision to close the season is based on scientific findings gathered during the fishing period and is formalized through a resolution issued by the Directorate General for Fisheries Planning and Management. According to the management plan the fishing season for Pacific anchoveta closes when the CPUE drops below 15% of the initial CPUE or when spawning begins—whichever comes first. Thus, these criteria can be considered a management trigger or harvest control threshold that has been taken by the authority for the Pacific anchoveta and it has been respected. The Management plan predicts the prohibition of the thread herring catches when the average size is below 17 cm and some fishery closures have been established based on that, for example in 2022 and 2024 through Resolution DGOMI 271/2022 and Resolution DGOMI 357/2024. Other cases the closure was related to the increase of the fishing effort and landings, for example, in 2023 through Resolution DGOMI 453/2023. Although it is not clear on regulations neither on the management plan that the thread herring fishery would be closed if the stock is below the limit reference point or proxy, the stock has never reached this limit and there is evidence that management authorities have been monitoring and closing the fishery according to the status

of the stock, fishing effort and landings, which can imply that actions will be taken if the biomass falls below the limit reference point.

The 2024 stock assessment concluded that the Pacific anchoveta biomass was above the reference biomass (Bmsy) of 110,000 tons. The fishing mortality that allows this management objective was estimated as Fmsy=0.32 and the average fishing mortality levels were estimated to be around 10% of the Fmsy. The conclusion was that the population was above the reference target and beyond the risk of overfishing and overexploitation in the last stock assessment. However, according to the most recent acoustic cruise, the Pacific anchoveta biomass at the end of March 2025 was estimated at 84,000 tonnes, thus below the reference biomass, but above Blim.

The 2024 assessment concluded that the thread herring biomass was above the reference biomass (Bmsy) of 40,000 tons. The reproductive potential was estimated to be around 50,000 tons, which would be 72% of the adult biomass that would have existed without fishing. However, fishing mortality has been higher than the Fmsy several times in the past, exceeding 10%. Thus, the stock failed in clause A.3.2. When assessing thread herring under Category B, the stock passed on Table B(a) as the biomass of thread herring is above the MSY /target reference point, and according to Canales and Sánchez (2024) the fishing mortality was below the Fmsy, with the average fishing mortality levels of the thread herring corresponded to 50% of the Fmsy, which was estimated on 0.071.

The remained species of this assessment were all assessed under Category D using a Productivity and Susceptibility Analysis (PSA) approach (Mexican barracuda, Peruvian mojarra, Pacific bumper, hairfin lookdown, Panama longfin herring, white mullet and Pacific smalleye croaker) and information provided mainly from FishBase. All species passed the PSA, with exception of Mexican barracuda . The species was analysed under Table D4. Considering the Least Concern status of this species in IUCN, low catches (about 0.1%) and general provisions of the management plan for the small pelagic fishery in Panama, the species passed D4.

Interactions with ETP species and the habitat are monitored by the On-Board Observer Program (OBOP) since 2016, which is used to assess the impact of the fishery on those elements of the ecosystem, and it has been shown there is low impact in both. The cruises performed before the opening of the fishing seasons, seek the integration of biological and oceanographic information all for the design of efficient management strategies, ensuring the viability of these fisheries. No interactions with turtles and marine mammals were reported by the OBOB in 2024. Most of the interactions with injures on seabirds were from *Pelecanus occidentalis*, which is listed as Least Concern. There are only a few catches of sharks. The fishery has no significant impact on marine habitats. There is an ETP and habitat management strategy in place for fishery.

In conclusion, the Pacific Anchoveta and Pacific thread fishery in Panama FAO 77, passed all the Marin Trust requirements in this assessment, therefore its re-approval is recommended to be used as a raw material in Marine Trust certified products.

Summary of CB peer review	The internal peer reviewer agrees with the assessor's determination of PASS for this fishery, noting that the

	management framework and surveillance, control and enforcement systems continue to meet the requirements of the MarinTrust Standard. The assessor has addressed any and all comments provided during the internal peer review process. Proper categorizations of Category A and D species were made. Thes species pass their respective clauses. The assessor agree with the approach taken for Pacific thread herring and it passes under Category B. The peer reviewer notes that further impacts on ETP, habitats and ecosystem have been evaluated and there is no evidence of significative impact of the fishery on these 3 components. They meet MT requirements. Therefore, the decision for approval under MarinTrust Wholefish v3.0 standard is supported by the CB.
Summary of external peer review (see Appendix 1 for the full peer review report)	The assessor has produced a clear, well-referenced report, offering thorough justification for all scoring decisions. The peer reviewer agrees with all the assessment outcomes and scores. Only minor comments provided.
Notes for on-site auditor	Please orientate the relevant organizations and stakeholders to make data publicly available, especially stock assessment and peer review reports, as well as the results from the observer program. The use of a Blimit and it is value need to be clarified as well as the possibility to close the fishery in case the biomass falls below this threshold as there is a risk the fishery might not pass in future assessments with the decline of the biomass.

Table 5: General results

Section	Outcome (Pass/Fail)
M1 - Management Framework	Pass
M2 - Surveillance, Control and Enforcement	Pass
E1 - Impacts on ETP Species	Pass
E2 - Impacts on Habitats	Pass
E3 - Ecosystem Impacts	Pass

Table 6: Species-specific results

See Table 7 for further details of species categorisation.

Category	Species name (common & Latin name)	Outcome (Pass/Fail/n/a)
Category A	Pacific anchoveta/*anchoveta/sardina* (*Cetengraulis mysticetus*)	Pass
Category B	Pacific thread herring/*arenque* (*Opisthonema spp.*)	Pass (Failed in category A)
Category D	Mexican barracuda/*barracuda gigante (Sphyraena ensis)*	Pass
Category D	Peruvian mojarra/*Palomillo aleta amarilla (Diapterus peruvianus/brevirostris)*	Pass
Category D	Pacific bumper/*orqueta (Chloroscombrus orqueta*)	Pass
Category D	Hairfin lookdown/*Jorobado antena (Selene brevoortii)*	Pass
Category D	Panama longfin herring/*sardina machete (Odontognathus panamensis)*	Pass
Category D	White mullet/*lisa* (*Mugil curema*)	Pass

Table 7: Species categorisation table

List of all the species assessed. Type 1 species are assessed against Category A or Category B. Type 1 species must represent 95% of the total annual catch. Type 2 species are assessed against Category C or Category D. Type 2 species may represent a maximum of 5% of the annual catch. Species that comprise less than 0.1% of the catch are not required to be assessed or listed here.

Species name (common & Latin name)	Stock	CITES listed yes/no	IUCN Red list Category	% catch composition	Management (Y/N)	Category (A, B, C or D)
Pacific anchoveta/*anchoveta/sardina* (*Cetengraulis mysticetus*)	Gulf of Panama	No	Least Concern	63.4%	Y	A
Thread herrings/*arenque* (*Opisthonema spp.*)	Gulf of Panama	No	Least Concern	35.0%	Y	B (failed A)
Mexican barracuda/*barracuda gigante* (*Sphyraena ensis*)	Gulf of Panama	No	Least Concern	0.2%	N	D
Peruvian mojarra/*Palomillo aleta amarilla (Diapterus peruvianus/brevirostris)*	Gulf of Panama	No	Least Concern	0.2%	N	D
Pacific bumper/*orqueta* (*Chloroscombrus orqueta)*	Gulf of Panama	No	Least Concern	< 1%	N	D
Hairfin lookdown/*Jorobado antena (Selene brevoortii)*	Gulf of Panama	No	Least Concern	0.1%	N	D
Panama longfin herring/ *sardina machete (Odontognathus panamensis)*	Gulf of Panama	No	Least Concern	0.1%	N	D
White mullet/lisa (Mugil curema)	Gulf of Panama	No	Least Concern	0.1%	N	D

References

Ceballes, A., Palacios, M. & Palacios, M. 2024. INFORME TÉCNICO PROGRAMA PRIVADO DE OBSERVADORES A BORDO. Pesquería de Pequeños Pelágicos de Panamá. Temporada 2023. CeDePesca. 50 pp

Management requirements

This section, or module, assesses the general management regime applied to the fishery under assessment. It comprises two parts, M1, which evaluates the management framework, and M2, which evaluates surveillance, control and enforcement within the fishery.

1.1. All management criteria must be met (pass) for a fishery to pass the Management requirements.

1.1.1. The sub-criteria offer a structured evidence base to demonstrate that the fishery sufficiently meets the management criteria. It is not expected that sub-criteria are assessed independently of the main criterion.

M1 Management framework

M1.1	**M1.1 There is an organisation responsible for managing the fishery.** *In reaching a determination for M1.1, the assessor should consider if the following is in place:*	
	M1.1.1 The management and administration organisations within the fishery are clearly identified.	
	M1.1.2 The functions and responsibilities of the management organisations include the overall regulation, administration, science and data collection and enforcement roles, and are documented and publicly available.	
	M1.1.3 Fishers have access to information and/or training materials through nationally recognised organisations.	
Outcome	*Pass*	

Rationale

The organisation responsible for the management of fisheries resources in Panama is the Aquatic Resources Authority of Panama (*Autoridad de los Recursos Acuáticos de Panamá*, ARAP), created by Law 44 of November 23th 2006 (https://arap.gob.pa/wp-content/uploads/2015/05/ARAP_legislacion_ley2006-44.pdf). ARAP is the body responsible for the data collection and analysis of fisheries resources in Panama with the support of *Albor Tecnológico,* which is the company in charge of conducting hydroacoustic survey with the support of the fishing industry and CeDePesca (CeDePesca 2021).

The small pelagic fishery of Panamá has been through a Fishery Improvement Program since 2013 and several trainings workshops have been held for on-board observer and skippers through the years (CeDePesca, 2020; 2025).

A new fisheries law was implemented in 2021, Law 204 of March 18th 2021 (https://arap.gob.pa/wpcontent/uploads/2023/02/Borrador-de-Reglamentaci%C3%B3n-de-Ley-de-Pesca.pdf)

According to the new law, the ARAP is responsible for preparing, updating and executing the National Fisheries and Aquaculture Policy, in coordination with the National Responsible

Fisheries Commission, the National Aquaculture Commission and all those entities linked to fishing, aquaculture and related activities.

A management plan was approved for the small pelagic fishery (including pacific anchoveta (*Cetengraulis mysticetus*), pacific herring (*Opisthonema* sp.) and pacific bumper (*Chloroscombrus orqueta*) in Panama in 2018 (Resolution ADM/ARAP 027 of August 28, 2018) and an update of the plan has been discussed (CeDePesca 2024).

Management measures related to the fishery are regularly published in the official gazette. Examples include:
• Closure of the anchoveta fishery in 2022 (Resolution DGOMI 152-2022): https://www.gacetaoficial.gob.pa/pdfTemp/29588/GacetaNo_29588_20220728.pdf

• Closure of the Pacific thread herrings fishery in 2022 (Resolution 271/2022): https://www.gacetaoficial.gob.pa/pdfTemp/29684/95490.pdf

Landing data is also publicly available at: https://www.datosabiertos.gob.pa/dataset/?tags=Pesca

References

Direct links to the legislation used have been included in the text (references in Spanish).

ARAP 2018. Plan de manejo de la pesqueria de pequenos pelagicos anchoveta, arenque y orqueta en el Pacifico de Panama. 31pp.

CeDePesca 2020. Taller de Identificación de aves marino-costeras que interactúan con la Pesquería de Pequeños Pelágicos del Golfo de Panamá. https://cedepesca.net/taller-de-identificacion-de-aves-marino-costeras-que-interactuan-con-la-pesqueria-de-pequenos-pelagicos-del-golfo-de-panama/

CeDePesca 2021. Programa Privado de Observadores a Bordo. Pesquería de Pequeños Pelágicos de Panamá.Informe Preliminar #1/2021. 3 pp

CeDePesca 2024. PANAMÁ – PEQUEÑOS PELÁGICOS: Se reunió el comité de manejo de la pesquería con participación de CeDePesca. https://cedepesca.net/panama-pequenos-pelagicos-se-reunio-el-comite-de-manejo-de-la-pesqueria-con-participacion-de-cedepesca/

CeDePesca 2025. Panamanian small pelagics. Fishery Improvement Project. https://cedepesca.net/prome/panamanian-small-pelagics/

M1.2	**M1.2 Fishery management organisations are legally empowered to take management actions.** *In reaching a determination for M1.2, the assessor should consider if the following is in place:*	
	M1.2.1	There are legal instruments in place to give authority to the management organisation(s) which can include policies, regulations, acts or other legal mechanisms.

	M1.2.2 Vessels wishing to participate in the fishery must be authorised by the management organisation(s).
	M1.2.3 The management system has a mechanism in place for the resolution of legal disputes.
	M1.2.4 There is evidence of the legal rights of people dependent on fishing for food or livelihood.
Outcome	*Pass*

Rationale

Article 4 numeral 2 of Law 44 of November 23, 2006, establishes that the ARAP has the power to apply the technical measures and processes for the rational, sustainable, and responsible use of aquatic resources, in order to protect the national aquatic heritage and contribute to the protection of the environment: https://arap.gob.pa/wp-content/uploads/2015/05/ARAP_legislacion_ley-2006-44.pdf

Law 204/2021, legally empowered ARAP to take management actions related to: Fishing Licenses, Management Plan of the Fishing Resources, applying Sanctions, etc: https://www.fao.org/faolex/results/details/en/c/LEX-FAOC201649/

The Panamanian judicial system is governed by statutory law. Disputes are resolved under the Administrative Procedures Law - Law 38 of 2000 that provides an appeal process if a responsible party believes that their right has been violated due to the imposition of an administrative sanction: http://www.cna.gob.pa/content/20161205145256-4.pdf

Panama's Fishery Law of 1959 recognizes subsistence fishing. Vessels greater than 10 GRT are classified as industrial fishing, while smaller vessels are classified as artisanal. There is an Action Plan for Sustainable Fisheries addresses artisanal fisheries management and development and provides mechanisms to observe the legal rights (MSC, 2022).

References

Direct links to the legislation used have been included in the text (references in Spanish).

MSC. 2022. Eastern Pacific Ocean tropical tuna - purse seine (TUNACONS) fishery MSC Fishery Assessment Report. Public Certification Report. https://fisheries.msc.org/en/fisheries/eastern-pacific-ocean-tropical-tuna-purse-seine-tunacons-fishery/@@view

M1.3	**M1.3 There is an organisation responsible for collecting data and (scientifically) assessing the fishery.** *In reaching a determination for M1.3, the assessor should consider if the following is in place:*
	M1.3.1 The organisation(s) responsible for collecting data and assessing the fishery is/are clearly identified.

	M1.3.2 The management system receives scientific advice regarding stock, non-target species and ecosystem status.
	M1.3.3 Scientific advice is independent from the management organisation(s) and transparent in its formulation through a clearly defined process.
Clause outcome	*Pass*

Rationale

ARAP is the body responsible for the data collection and analysis of fisheries resources in Panama with the support of Albor Tecnológico which was the company in charge of conducting hydroacoustic survey with the support of the fishing industry and CeDePesca (CeDePesca 2021).

A management plan was approved for the small pelagic fishery (including pacific anchoveta (*Cetengraulis mysticetus*), pacific herring (*Opisthonema* sp.) and pacific bumper (*Chloroscombrus orqueta*) in Panama in 2018 (Resolution ADM/ARAP 027 of August 28, 2018) and an update of the plan has been discussed (CeDePesca 2024).

During the fishing season, data on CPUEs, size, and weight and maturity is collected by onboard observers for the main target species of this stock (Ceballes et al., 2024). The General Direction of Research and Development collects that information and it feeds directly on the advice to the authorities and subsequent regulations (see for example the text of the closure of the anchoveta fishery which makes specific reference to CPUEs per week and size classes in the catch) (https://www.gacetaoficial.gob.pa/pdfTemp/30008/GacetaNo_30008_20240411.pdf - page 31).

References

Ceballes, A., Palacios, M. & Palacios, M. 2024. INFORME TÉCNICO PROGRAMA PRIVADO DE OBSERVADORES A BORDO. Pesquería de Pequeños Pelágicos de Panamá. Temporada 2023. CeDePesca. 50 pp.

CeDePesca 2021. PROYECTO DE MEJORAS DE LA PESQUERÍA. I Campaña 2021 - Evaluación Hidroacústica de Recursos Pelágicos. INFORME EJECUTIVO- PANAMÁ. Del 21 al 27 de febrero 2021

CeDePesca 2024. PANAMÁ – PEQUEÑOS PELÁGICOS: Se reunió el comité de manejo de la pesquería con participación de CeDePesca. https://cedepesca.net/panama-pequenos-pelagicos-se-reunio-el-comite-de-manejo-de-la-pesqueria-con-participacion-de-cedepesca/

M1.4	**M1.4 The fishery management system is based on the principles of sustainable fishing and a precautionary approach.** *In reaching a determination for M1.4, the assessor should consider if the following is in place:*
	M1.4.1 A policy or long-term management objective for sustainable harvesting based on the best scientific evidence and a precautionary approach is publicly available and implemented for the fishery.
Outcome	*Pass*

Rationale

ARAP's mission is to ensure the development of a productive and social culture of aquatic resources in a sustainable and sustainable way in harmony with the environment to improve the quality of life of the inhabitants of the Republic.

In 2017, the government of Panama approved the Action Plan for Sustainable Fisheries (ARAP, 2017). The Plan is intended to guide the reform of the outdated legal framework and improve coordination at the sectoral and inter-institutional levels. The Action Plan for Sustainable Fisheries guides the work of the National Responsible Fisheries Commission that can recommend initiatives to achieve sustainable development of fisheries sector, as well as policies and measures that are necessary, in order to regulate fishing activity in Panama's EEZ.

Law No. 204 regulating fishing and aquaculture in Panama was passed in March 2021 replacing the Fisheries Act of 1959. Article 8 lists the main objectives of the law, including to implement a sustainable management of the fishery resources and the application of the precautionary approach to fisheries management in the country (https://cedepesca.net/wp-content/uploads/2021/08/Panama-Ley-de-Pesca2021.pdf).

References

Direct links to the legislation used have been included in the text (references in Spanish).

Aquatic Resources Authority of Panama 2017. Action Plan for Sustainable Fisheries https://arap.gob.pa/avances-plan-de-accion-pesca-sostenible-en-panama/

M1.5	**M1.5 There is a clearly defined decision-making process which is transparent, with processes and results made publicly available.** *In reaching a determination for M1.5, the assessor should consider if the following is in place:*
	M1.5.1 There is participatory engagement through which fishery stakeholders and other stakeholders can access, provide information, consult with, and respond to, the management systems' decision-making process.
	M1.5.2 The decision-making process is transparent, with results made publicly available.
	M1.5.3 The fishery management system is subject to periodic internal or

	external review to validate the decision-making process, outcomes and scientific data.
Outcome	*Pass*

Rationale

Law No. 6 of 22 January 2002, which handles transparency of the public sector (Panama's Freedom of Information legislation). Law No. 33 of 25 April 2013, which makes provision for an Information Officer to exist within each public institution with responsibility for proactive transparency, open data and information requests. A formal process of consultation and representation for the development of regulations under Law 204 was established in April 2021 by Administrative Resolution 022. Article 8 of the law 204/2021 lists the main objectives, among which is to promote stakeholder participation in fisheries management in the country (https://cedepesca.net/wp-content/uploads/2021/08/Panama-Ley-de-Pesca-2021.pdf).

Fishery stakeholders (which include the reduction industry (Promarina and Probasa), NGOs (CeDePesca) and management authorities (ARAP)) were engaged in the development of the research and management of the fishery via the FIP which has been in place since 2011.

In 2017, Panama approved the Action Plan for Sustainable Fisheries(ARAP, 2017). The Action Plan was published following extensive stakeholder consultation.

In 2021, a management committee was created for this fishery. It includes representatives from the government-ARAP (1), from the fishmeal industry (1), from the pelagic industrial fishery (1), from the pelagic artisanal fishery (1) and a representative from a relevant NGO. The role of this committee is to monitor the execution and/or modification of the small pelagic fishery management plan (https://cedepesca.net/wp-content/uploads/2021/08/Anexo-VII.-Agenda-comite-Pequenos-PelagicosMarzo-2021-y-borrador-reglamento.pdf). Recently the ARAP conducted a number of meetings with artisanal and industrial fishermen to discuss the specific legislation for the different fisheries covered by the law, including the pelagic fishery (https://www.panamaamerica.com.pa/economia/arap-y-sector-pesquero-revisan-regulacion-de-ley-de-pesca-1227480)

A management plan was approved for the small pelagic fishery (including pacific anchoveta (*Cetengraulis mysticetus*), pacific herring (*Opisthonema* sp.) and pacific bumper *(Chloroscombrus orqueta*) in Panama in 2018 (Resolution ADM/ARAP 027 of August 28, 2018).

Management measures related to the fishery are regularly published in the official gazette. Examples include:
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• Closure of the Pacific thread herrings fishery in 2022 (Resolution 271/2022): https://www.gacetaoficial.gob.pa/pdfTemp/29684/95490.pdf

Landing data is also publicly available at: https://www.datosabiertos.gob.pa/dataset/?tags=Pesca

References

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Aquatic Resources Authority of Panama. Laws and Administrative Resolutions https://arap.gob.pa/legislacion/

ARAP 2018. Plan de manejo de la pesqueria de pequeños pelagicos anchoveta, arenque y orqueta en el Pacifico de Panama. 31pp

Ley N° 6 de 22 de enero de 2002. Que dicta normas para la transparencia en la gestión pública, establece la acción de Hábeas Data y dicta otras disposiciones. https://www.oas.org/es/sla/ddi/docs/acceso_informacion_base_dc_leyes_pais_P_2.pdf

LEY 33 De 25 de abril de 2013, Que crea la Autoridad Nacional de Transparencia y Acceso a la Información. https://www.digeca.gob.pa/tmp/file/1202/Ley%20No-33%20DE%2025%20abril%20de%202013%20-Que%20crea%20la%20Antai.pdf

M2 Surveillance, control and enforcement

M2.1	**M2.1 There is an organisation responsible for monitoring compliance with fishery laws and regulations.** *In reaching a determination for M2.1, the assessor should consider if the following is in place:*	
	M2.1.1	There is an organisation responsible for monitoring compliance with specific monitoring, control and surveillance (MCS) mechanisms in place.
	M2.1.2	There are relevant tools or mechanisms used to minimise IUU fishing activity.
	M2.1.3	There is evidence of monitoring and surveillance activity appropriate to the intensity, geography, management control measures and compliance behaviour of the fishery.
Outcome	*Pass*	

Rationale

In 2009, a National Action Plan to prevent, discourage and eliminate illegal, unreported, and unregulated (IUU) was produced containing comprehensive monitoring, control and surveillance (MCS actions). It identified the implementing authorities as the Maritime Authority of Panama, through the Directorate of Merchant Marine, the National Air Service, the National Customs Authority, the Ministry of Health, through the Directorate of Public Health, Department of Food Protection, and the Ministry of Foreign Relations through the Directorate-General for International Economic Relations.

The ARAP's Directorate of Inspection, Surveillance and Control (DISC) (https://arap.gob.pa/direccion-de-inspeccion-vigilancia-y-control-2/) is responsible for monitoring compliance with fishery laws and regulations (Article 38 of Panama Law no. 44, 2006). The objective of the DISC is to "Promote, organize, monitor, coordinate and execute the general policy, strategy, plans and programs regarding inspection, surveillance, control and control of aquatic resources". DISC tasks include conducting inspections, establishing base parameters to be followed in terms of technical standards for fishing and aquaculture activities, issuing of certificates of inspections, investigating complaints, ensuring vessels adhere to safety legislation, and imposing sanctions for violations of legal and regulatory norms regulations (https://arap.gob.pa/wp-content/uploads/2015/05/ARAP_legislacion_ley-2006-44.pdf).

In mid-2025, Panama will need to show its commitment to combating IUU fishing to the Directorate-General for Maritime Affairs and Fisheries (DG Mare) of the European Commission. Since October 15, 2024, Panama has been implementing several of the recommendations issued by DG Mare. ARAP has reduced and streamlined the list of authorized ports for maritime operations, going from 290 to 92 ports. This change was made because Panama could not ensure full control at all previous points of entry and exit for fishing resources. A smartphone tool "ARAP Móvil" app for reporting illegal fishing activities was developed. The app helps coordinate the identification and location of vessels engaged in such practices. ARAP is also working on additional initiatives, such as a national fisheries traceability system, which will include software to monitor and manage the operations of the country's fishing fleets (La

estrella de Panamá, 2025).
References Direct links to the legislation used have been included in the text (references in Spanish). La estrella de Panamá. 2025. Panamá afina estrategia en su lucha contra la pesca ilegal y conseguir la tarjeta verde. https://www.laestrella.com.pa/economia/panama-afina-estrategia-en-su-lucha-contra-la-pesca-ilegal-y-conseguir-la-tarjeta-verde-GD10752150

M2.2	**M2.2 There is a framework of sanctions which are applied when infringements against laws and regulations are discovered.** *In reaching a determination for M2.2, the assessor should consider if the following is in place:*	
	M2.2.1 The laws and regulations provide for penalties or sanctions that are adequate in severity to act as an effective deterrent.	
	M2.2.2 There is no evidence of systematic non-compliance.	
Outcome	*Pass*	

Rationale

Title VIII of the Law 204/2021 the type of infractions and sanctions to be implemented are found from article 195 to 201. Minor infractions are fined with fines between $5 (per meter of the vessel sanctioned) and $45,000 (international fisheries), and serious infractions with fines between $20 (per meter) and $50,000. Fishing permits, licenses or authorisations may be also revoked by the authorities.

A number of measures have been implemented in the fishery which make difficult for fishers to be non-compliant with the regulations in the small pelagic fishery, such as: the implementation of a catch database, the introduction of an on-board observer programme with the objective of covering at least 20% of the trips (Executive decree no 107 2016 (http://www.viceipup.up.ac.pa/cidim/files/ARAP-Decreto-Ejecutivo-107-de-2016.pdf), VMS for all industrial vessels, and landing declarations (Law 204/2021) (https://arap.gob.pa/wp-content/uploads/2023/02/Borrador-de-Reglamentaci%C3%B3n-de-Ley-de-Pesca.pdf).

Since 2022, the country has a control and monitoring center for local and international vessels to prevent illegal fishing. Progress on fighting the IUU fishing has been praised by the EU (La estrella de Panamá, 2023). Recently, National Border Service (Senafront) responded to a citizen report about a fishing vessel operating illegally in a protected area of Piña Bay, in the Darién province. The vessel, named Ana de Jesús and flying the Panamanian flag, was found about 10 miles offshore in a zone restricted for large-scale fishing. After inspecting the vessel and coordinating with ARAP, authorities confirmed it was carrying 1,672 pounds of seafood, including various species such as ajillo fish, mahi-mahi, black grouper, red grouper, yellow snapper, and others. Although the vessel was allowed to continue its journey, the captain was summoned by ARAP for the corresponding administrative proceedings and the catches were confiscated (La estrella de Panamá, 2025).

References

Direct links have been included in the text (references in Spanish).

La estrella de Panamá. 2023. Panamá aumenta la vigilancia en contra de la pesca ilegal no declarada. https://www.laestrella.com.pa/vida-y-cultura/planeta/panama-aumenta-vigilancia-pesca-ilegal-DELE490993)

La estrella de Panamá. 2025. Panamá afina estrategia en su lucha contra la pesca ilegal y conseguir la tarjeta verde. https://www.laestrella.com.pa/economia/panama-afina-estrategia-en-su-lucha-contra-la-pesca-ilegal-y-conseguir-la-tarjeta-verde-GD10752150

Ley Nº 204 - Ley que regula la pesca y la acuicultura en la República de Panamá. https://www.fao.org/faolex/results/details/en/c/LEX-FAOC201649/

M2.3	**M2.3 There is substantial evidence of widespread compliance in the fishery, and no substantial evidence of IUU fishing.** *In reaching a determination for M2.3, the assessor should consider if the following is in place:*	
	M2.3.1	The level of compliance is documented and updated routinely, statistically reviewed and available.
	M2.3.2	Fishers provide additional information and cooperate with management/enforcement agencies/organisations to support the effective management of the fishery.
	M2.3.3	The catch recording and reporting system is sufficient for effective traceability of catches per vessel and supports the prevention of IUU fishing.
Outcome	*Pass*	

Rationale

The number of catches of Panamá fisheries is published monthly on: https://www.datosabiertos.gob.pa/dataset/?tags=Pesca

The administrative sanctioning processes held monthly by ARAP is presented in this website: https://www.datosabiertos.gob.pa/group/agropecuario

The number of vessels in the fishery seems to be relatively low and compliance with the management measures considered adequate.

In mid-2025, Panama will need to show its commitment to combating IUU fishing to the Directorate-General for Maritime Affairs and Fisheries (DG Mare) of the European Commission, as the State had received an yellow card in 2019 from European Commission. Since October 15, 2024, Panama has been implementing several of the recommendations issued by DG Mare. ARAP has reduced and streamlined the list of authorized ports for maritime operations, going from 290 to 92 ports. This change was made because Panama could not ensure full control at

all previous points of entry and exit for fishing resources. A smartphone tool "ARAP Móvil" app for reporting illegal fishing activities was developed. The app helps coordinate the identification and location of vessels engaged in such practices. ARAP is also working on additional initiatives, such as a national fisheries traceability system, which will include software to monitor and manage the operations of the country's fishing fleets (La estrella de Panamá, 2025).

References

Direct links have been included in the text (references in Spanish).

La estrella de Panamá. 2025. Panamá afina estrategia en su lucha contra la pesca ilegal y conseguir la tarjeta verde. https://www.laestrella.com.pa/economia/panama-afina-estrategia-en-su-lucha-contra-la-pesca-ilegal-y-conseguir-la-tarjeta-verde-GD10752150

Species requirements

This section, or module, comprises of four species categories. Each species in the catch is subject to an assessment against the relevant species category in this section (see clauses 1.2 and 1.3 and Table 6).

Type 1 species can be considered the 'target' or 'main' species in the fishery under assessment. They make up the bulk of the catch and a subjected to a detailed assessment. Type 1 species must represent 95% of the total annual catch. If a species-specific management regime is in place for a Type 1 species, it shall be assessed under Category A. If there is no species-specific management regime in place for a Type 1 species, it shall be assessed under Category B.

Type 2 Species can be considered the 'non-target' species in the fishery under assessment. They comprise a small proportion of the annual catch and are subjected to a relatively high-level assessment. Type 2 species may represent a maximum of 5% of the annual catch. If a species-specific management regime is in place for a Type 2 species, it shall be assessed under Category C. If there is no species-specific management regime in place for a Type 2 species, it shall be assessed under Category D.

Species that comprise less than 0.1% of the catch are not required to be assessed or listed here.

Category A species

2.1. All clauses must be met for a species to pass the Category A assessment.

2.1.1. If a species fails any of the Category A clauses, it should be re-assessed as a Category B species.

Pacific anchoveta (*Cetengraulis mysticetus*)

A1 Data collection

A1.1	**A1.1 Landings data are collected such that the fishery-wide removals of this species are known.**
Outcome	*Pass*
Rationale Catch data per trip between 1995 and 2023 was used to assess the status of the stock in 2024 (Figure 1) (Canales and Sánchez, 2024).	

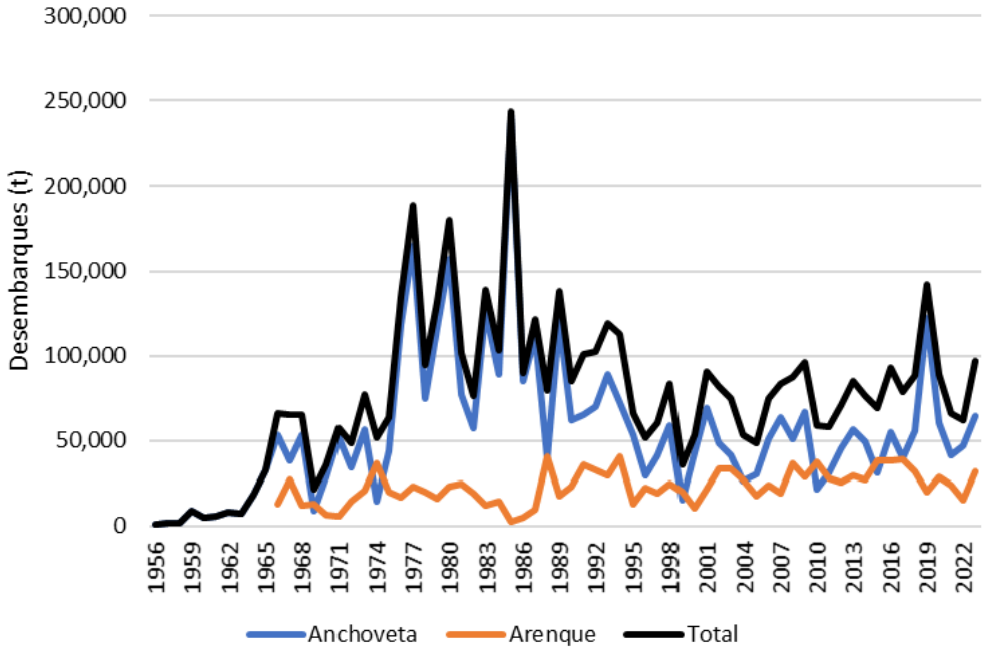

Figure 1. Landing data of Pacific anchoveta (in blue) and thread herring (in orange) (Canales and Sánchez, 2024).

During the 2024 fishing season, 64,636.3 tonnes of Pacific anchoveta were landed, according to data provided by the MarinTrust applicant (Table 1).

Table 1. Landing data provided by the MarinTrust applicant for the most recent fishing season.

2024	PACIFIC ANCHOVETA	HERRING	TOTAL
APRIL	11927.4	625	12552.4
MAY	28365.88	601.42	28967.3
JUNE	14869.82	2754.58	17624.4
JULY	7794.7	3029.8	10824.5
AUGUST	1341.4	13476.5	14817.9
SEPTEMBER	337.1	7504.2	7841.3
OCTOBER	0	3293.3	3293.3
TOTAL	64636.3	31284.8	95921.1

References

Canales M.C and Sánchez N, 2024. Evaluación de los stocks de anchoveta (*Cetengraulis mysticetus)* y arenque (*Opisthonema spp.)* en el Golfo de Panamá, 1995-2023 https://cedepesca.net/wp-content/uploads/2025/05/V1-Informe_EvaluacionStocks_PP_Panama_2024.pdf

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

Rationale

Monitoring and collection of biological-fishing data have been carried out by ARAP and by CeDePesca, with industry support since the mid-nineties. Recently, the fishing companies "Promarina" and "Probasa" have financed the development of six acoustic cruisers with the aim of making biomass estimates available for the purpose of management recommendations (Canales and Sánchez, 2024).

Despite some issues with data from acoustic survey, sufficient additional information is collected to allow for an indication of stock status to be estimated. Data from landings, CPUEs, size classes, and hydroacoustic biomass estimates are complemented by onboard observer data collected during the fishing season, including size, weight, maturity, and CPUEs (Figure 2). These multiple sources were used in the 2024 stock assessment, with findings directly informing management advice and regulations through the General Directorate of Research and Development.

Although the 2024 assessment (Canales and Sánchez, 2024) noted that acoustic biomass estimates may be overestimated—by about 5% for anchoveta and 20% for thread herring—due to survey timing and changes in size-specific availability, the overall data still provide meaningful insights into stock conditions. CeDePesca has informed the assessment team that a consultancy is predicted on 2025 to evaluate the best time and strategy for hydroacoustic assessment (E. Godelman, personal communication, 12th May 2025). Finally, the fleet's selectivity appears to target individuals at or above maturity size, reducing the risk of recruitment overfishing.

Recent data reinforce the utility of these monitoring efforts. According to the most recent acoustic cruise, the anchovy biomass at the end of March 2025 was estimated at 84,000 tons. The stock was composed mainly of adults between 10.0 cm and 21.0 cm total length, with a dominant mode at 18.0 cm, and showed a minimal presence of juveniles (only 0.1% by number), indicating low recent recruitment (Valdez et al., 2024). These findings highlight the need for cautious management but also demonstrate that the system in place is capable of detecting significant biomass fluctuations and informing responsive measures.

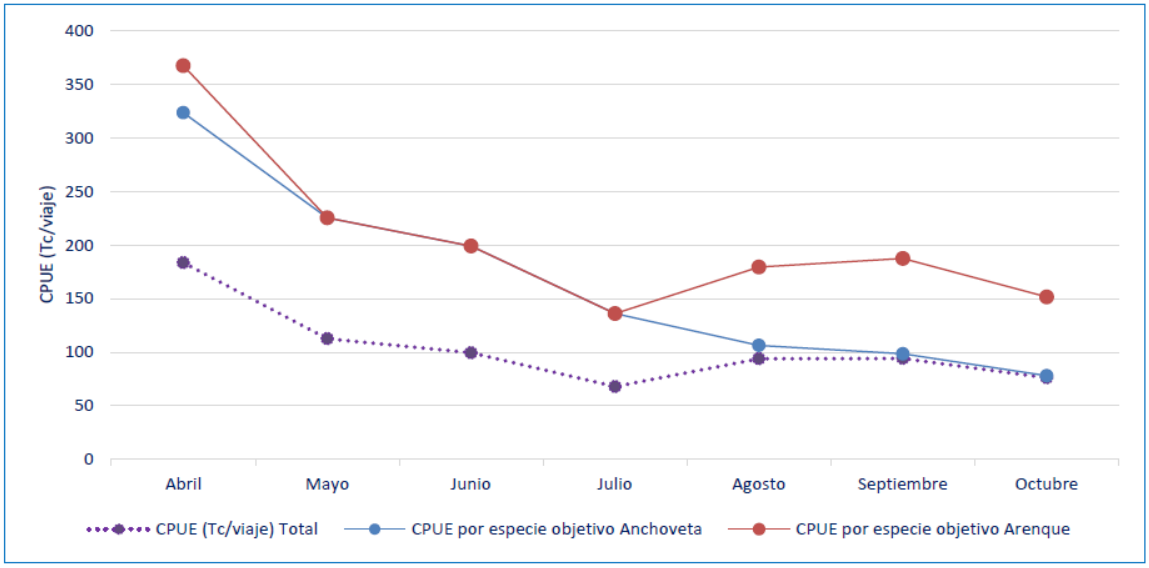

Figure 2. Monthly trend of Catch per Unit Effort (tons per trip) — total and by target species — as recorded by the Onboard Observer Program (POAB) of the small pelagic fishery in the Gulf of Panama during the 2024 season (Ceballes et al., 2024).

References

Canales M.C and Sánchez N, 2024. Evaluación de los stocks de anchoveta (*Cetengraulis mysticetus*) y arenque (*Opisthonema spp.*) en el Golfo de Panamá, 1995-2023 https://cedepesca.net/wp-content/uploads/2025/05/V1-Informe_EvaluacionStocks_PP_Panama_2024.pdf

Ceballes, A., Palacios, M. & Palacios, M. 2024. INFORME TÉCNICO PROGRAMA PRIVADO DE OBSERVADORES A BORDO. Pesquería de Pequeños Pelágicos de Panamá. Temporada 2023. CeDePesca. 50 pp.

Valdez, C., Iriarte, F., Escobar. C., Fuertes, J. 2024. "Evaluación Hidroacústica de recursos pelágicos en la Bahía de Panamá a bordo de la E/P Anchovetas II del 15 al 21 de marzo de 2025". Informe ejecutivo, 45 pp.

A2 Stock assessment

Pacific anchoveta (*Cetengraulis mysticetus*)

A2.1	**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.**
Outcome	*Pass*

Rationale

Stock assessments for Pacific anchoveta and Pacific thread herring were conducted in 2015, 2016, 2020, and 2024. In addition, before the annual fishing season, the authorities (ARAP) in collaboration with ALBOR tecnologico and CeDePesca conduct a hydroacoustic survey to assess the status of the stocks (Table 2) and based on that information a potential catch for the fishing season is estimated. Data from landings, CPUEs, size classes, and hydroacoustic biomass estimates are complemented by onboard observer data collected during the fishing season, including size, weight, maturity, and CPUEs. These multiple sources were used in the 2024 stock assessment (Canales and Sánchez, 2024), with findings directly informing management advice and regulations through the General Directorate of Research and Development.

Table 2. Biomass and catches of the target species during the period 2017 – 2025 (Valdez et al., 2024)).

AÑO	BIOMASA ESTIMADA (t)			CAPTURAS (t) *(Fuente:ARAP)		
	Anchoveta	Arenque	Total	Anchoveta	Arenque	Total
2017	233,138	151,042	384,180	41,463	32,514	73,977
2018	249,851	180,493	430,344	42,011	26,965	68,977
2019	135,596	220,587	356,183	115,747	18,808	134,555
2020	*NO HUBO CRUCERO*			58,276	29,170	87,446
2021	115,775	154,844	270,619	31,029	23,964	54,993
2022	292,864	92,650	385,514	36,431	16,760	53,192
2023	225,523	112,316	337,839	50,068	30,832	80,900
2024	278,742	96,259	375,001	58,902	28,116	87,018
2025	84,428	80,869	165,297			

References

Valdez, C., Iriarte, F., Escobar. C., Fuertes, J. 2024. “Evaluación Hidroacústica de recursos pelágicos
en la Bahía de Panamá a bordo de la E/P Anchovetas II del 15 al 21 de marzo de 2025”. Informe
ejecutivo, 45 pp.

Canales M.C and Sánchez N, 2024. Evaluación de los stocks de anchoveta (*Cetengraulis mysticetus*) y arenque (*Opisthonema spp*.) en el Golfo de Panamá, 1995-2023. https://cedepesca.net/wp-content/uploads/2025/05/V1-Informe_EvaluacionStocks_PP_Panama_2024.pdf

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

Rationale

The Biological Reference Points (BRPs) for Pacific anchoveta were estimated by projecting the biomass quarterly over the long term for different values of average annual fishing mortality. A management objective has been established for these stocks to ensure that at least 60% of the virgin biomass (Target reference point) is kept for the stock. Hydroacoustic surveys are carried out before the fishing season to provide an estimation of the biomass and inform the maximum allowable catch for the season. In the last stock assessment, a proxy for Maximum Sustained Yield was estimated as a spawning biomass Bmsy = 110 thousand tonnes. The fishing mortality that allows this management objective was estimated as Fmsy=0.32 by quarter-term (Canales and Sánchez, 2024).

References

Canales M.C and Sánchez N, 2024. Evaluación de los stocks de anchoveta (*Cetengraulis mysticetus*) y arenque (*Opisthonema spp*.) en el Golfo de Panamá, 1995-2023. https://cedepesca.net/wp-content/uploads/2025/05/V1-Informe_EvaluacionStocks_PP_Panama_2024.pdf

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

Rationale

The most recent stock assessment estimates appropriate levels of fishery removals based on the current status of the Pacific anchoveta population. This is the second assessment to incorporate several key recommendations from Minte-Vera (2021) peer-review, using comprehensive data spanning from 1995 to 2023.

CeDePesca has clarified to the assessment team that the stocks assessments are based on the quarter as the time unit, and it's not easy to translate that data into annual terms (E. Godelman, personal communication, 12th May 2025). In a species like Pacific anchoveta, whose fishery is essentially based on a single annual cohort, biomass is constantly changing, as each individual grows very quickly (from 1 to 12 cm in six months) and they don't all hatch at the same time. If there were no fishing, it would be seen a rapid increase in biomass at the beginning of the year (until May in a normal year), followed by a logarithmic decline due to natural mortality. Fishing mimics that pattern, only accelerating the decline of that cohort until it reaches a CPUE-based threshold. That's why it can't be managed the same way as longer-lived species, and it's difficult to define an annual quota equivalent to the MSY.

The Biological Reference Points (BRPs) for Pacific anchoveta are estimated by projecting the biomass quarterly over the long term for different values of average annual fishing mortality. The analysis included daily catch data per vessel to develop a relative abundance index, and modeled population dynamics quarterly for each species, incorporating size composition to detect trends in recruitment and the impacts of fishing mortality (Canales and Sánchez, 2024).

The models were tested under various biological assumptions, including natural mortality, growth, and potential hyper-stability in CPUE data. A spawning biomass equal to 60% of the virgin spawning biomass was used as a proxy for Maximum Sustainable Yield. Seven additional model scenarios were explored to assess structural uncertainty in anchoveta estimates. All scenarios consistently indicated a healthy stock status, with anchoveta biomass well above reference points (Canales and Sánchez, 2024). Canales and Sánchez (2024) informed that although the base model showed a tendency to underestimate biomass (by 0.8% for anchovy and 13% for herring) and overestimate fishing mortality (by 0.9% for anchovy and 8% for herring), these values were considered within acceptable bias levels (Carvalho *et al*., 2021). Furthermore, Canales (2020) affirmed that the stock had never shown signs of overexploitation.

References

Canales 2020. Evaluación de los stocks de anchoveta (*Cetengraulis mysticetus*) y arenque (*Opisthonema* sp.) en el Golfo de Panama. CeDePesca. 48 pp. https://cedepesca.net/wp-content/uploads/2020/03/Informe_Evaluaci%C3%B3nStocks_PP_Panama-Canales-CeDePesca.pdf

Canales M.C and Sánchez N, 2024. Evaluación de los stocks de anchoveta (*Cetengraulis mysticetus*) y arenque (*Opisthonema spp*.) en el Golfo de Panamá, 1995-2023. https://cedepesca.net/wp-content/uploads/2025/05/V1-Informe_EvaluacionStocks_PP_Panama_2024.pdf

Carvalho, F., Winker, H., Courtney, D., Kapur, M., Kell, L.T., Cardinale, M., Schirripa, M., Kitakado, T., Yemane, D., Piner, K., Maunder, M., Taylor, I., Wetzel, C., Doering, K., Johnson, K.F. and Methot, R., A 2021. Cookbook for using model diagnostics in integrated stock assessments, Fisheries Research, ISSN 0165-7836, 240, 2021, p. 105959, JRC121483.

Minte-Vera, C.V. 2021. Revisión por pares de la evaluación de los stocks de anchoveta (*Cetengraulis mysticetus*) y arenques de hebra (*Opisthonema spp.)* en el Golfo de Panamá 2021 (informe no-publicado. 35 pgs).

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

Rationale

In 2020, the assessment of the Panamanian pelagic fishery was reviewed by Minte-Vera 2021. A number of short-and medium-term recommendations were given in the review to improve the assessment of the stocks. The 2024 stock assessment used recommendations from Minte-Vera 2021 (Canales and Sánchez, 2024).

References

Canales M.C and Sánchez N, 2024. Evaluación de los stocks de anchoveta (*Cetengraulis mysticetus*) y arenque (*Opisthonema spp*.) en el Golfo de Panamá, 1995-2023.

https://cedepesca.net/wp-content/uploads/2025/05/V1-Informe_EvaluacionStocks_PP_Panama_2024.pdf

Minte-Vera, C.V. 2021. Revisión por pares de la evaluación de los stocks de anchoveta (*Cetengraulis mysticetus*) y arenques de hebra (*Opisthonema* spp.) en el Golfo de Panamá 2021 (informe no-publicado. 35 pgs).

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

Rationale

The 2020 stock assessment can be accessed from the CeDePesca website: https://cedepesca.net/wp-content/uploads/2020/03/Informe_Evaluaci%C3%B3nStocks_PP_Panama-Canales-CeDePesca.pdf

The 2024 stock assessment was made available under request by CeDePesca through contact by the MarinTrust applicant in the following link: https://cedepesca.net/wp-content/uploads/2025/05/V1-Informe_EvaluacionStocks_PP_Panama_2024.pdf and now it is possible to find in on google search.

References

Canales 2020. Evaluación de los stocks de anchoveta (*Cetengraulis mysticetus*) y arenque (*Opisthonema* sp.) en el Golfo de Panama. CeDePesca. 48 pp https://cedepesca.net/wp-content/uploads/2020/03/Informe_Evaluaci%C3%B3nStocks_PP_Panama-Canales-CeDePesca.pdf

Canales M.C and Sánchez N, 2024. Evaluación de los stocks de anchoveta (*Cetengraulis mysticetus*) y arenque (*Opisthonema spp*.) en el Golfo de Panamá, 1995-2023. https://cedepesca.net/wp-content/uploads/2025/05/V1-Informe_EvaluacionStocks_PP_Panama_2024.pdf

A3 Harvest strategy
Pacific anchoveta (*Cetengraulis mysticetus*)

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

Rationale

Article 15 of Executive Decree No. 107 of March 2016 indicates that the opening of the small pelagic fishing season will be carried out every year by resolution of the ARAP considering the availability of the resource and the size structures of the target species. That information is collected through biological samplings, carried out in a pre-season fishing survey, which is conducted by Albor Tecnológico, support by the fishmeal and fish oil processing companies and coordinated by the ARAP (CeDePesca 2021).

The fishing season starts when the average size of the specimens of Pacific anchoveta and Pacific thread herring in each fishing ground is greater than sizes that have been historically considered as acceptable and which coincide with average size at first maturity in the literature (12.5 cm for Pacific anchoveta and 17 cm for Pacific thread herring). Pacific anchoveta is the first target species of the fishery until July, when spawning is about to reach its peak. From July onwards, Pacific thread herring becomes the target species until October, when weekly yields start to decrease, and the fishery is closed through an ARAP administrative resolution. The fishery is closed by ARAP's resolution, according to the scientific reports based on the monitoring and research on the fishery during the season, as defined by Article 16 of Executive Decree No. 107 of March 2016.

Article 1 and Article 3 of Executive Decree 107 of May 2016 states that all vessels targeting anchoveta, herring, or bumper must possess and carry a fishing license issued for those species specifically. The total number of licenses available are a maximum of 20 licenses for large (industrial) vessels and 10 for small vessels. Small vessels must be below 8m in length, and must have a fish storage hold smaller than 3 cubic metres; industrial vessels are limited to a maximum hold size of 188 cubic metres. Licensed vessels of any size may only be replaced if completely removed from the fishery, and the new vessel will be issued the same licence number as the replaced vessel.

The stock is managed under the small pelagic management plan (RESOLUCIÓN ADM/ARAP No.027, 2018). Hydroacoustic surveys are conducted before the fishing season. The fishing season starts and the TACs are set taking into consideration the data collected during the survey, which is usually biomass estimates and size structure, etc. The main mechanisms by which total removals are currently restricted are seasonal closures and restrictions on total fishing licences. The fishery is closed by the authorities based on the monitoring of the fishery.

References

CeDePesca 2021. Programa Privado de Observadores a Bordo.Pesquería de Pequeños Pelágicos de Panamá.Informe Preliminar #1/2021. 3 pp

Executive Decree 107 of May 2016. https://www.fao.org/faolex/results/details/es/c/LEX-FAOC164002/

RESOLUCIÓN ADM/ARAP No.027, 2018. Plan de Manejo de la Pesquería de Pequeños Pelágicos, anchoveta (*Cetengraulis mysticetus*), arenque (*Opisthonema* sp.) y orqueta (*Chloroscombrus orqueta*) en el Pacífico de Panamá, 2018. https://faolex.fao.org/docs/pdf/pan180840.pdf

A3.2	**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.**
Outcome	*Pass*

Rationale

Catches of Pacific anchoveta in the last 10 years have been at around 45,000 (Canales and Sánchez, 2024).The trajectory of quarterly fishing mortality shows that it has varied seasonally below the reference fishing mortality Fmsy (Figure 3 and Table 3). The fishing mortality that allows this management objective was estimated as Fmsy=0.32 and the average fishing mortality levels were estimated to be around 10% of the Fmsy in the last stock assessment (Canales and Sánchez, 2024).

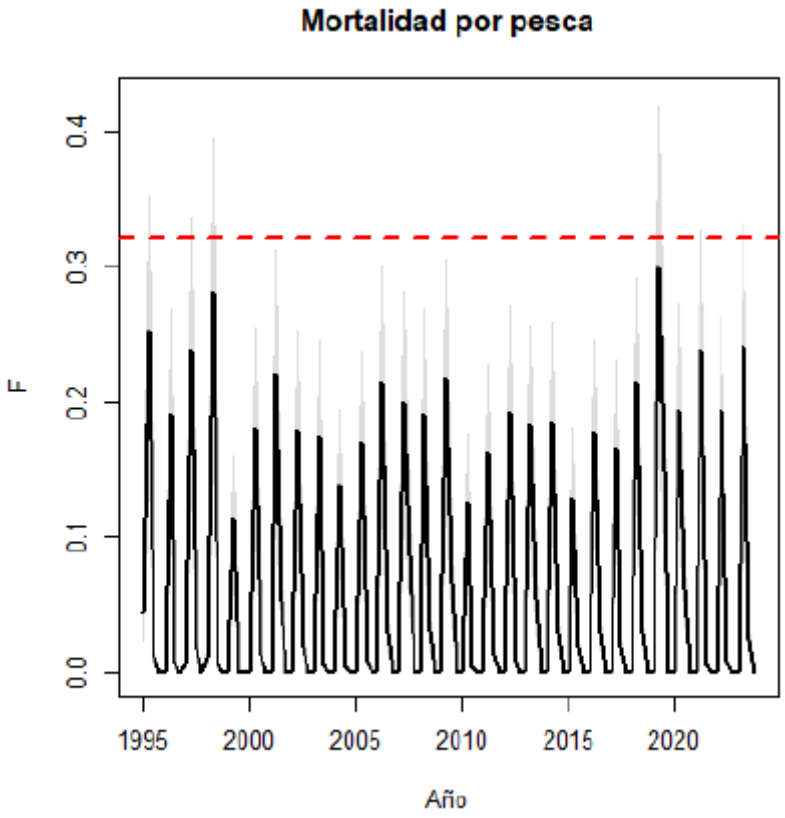

Figure 3. Quarterly variation in fishing mortality of Pacific anchoveta. The red line indicates the Fmsy=0.32 (Canales and Sánchez, 2024).

Table 3. Estimates of adult biomass, recruitment, fishing mortality, virgin adult biomass reduction, and reproductive

potential ratio (SPR) of Pacific anchoveta.

Año.trimestre	Biomasa (t)	R_R0	Fcr	F_Fmrs	B_Brms	B_B0	SPR
2018.25	211646	0.270	0.210	0.670	1.760	1.050	0.900
2018.50	194331	3.860	0.030	0.090	1.610	0.970	0.860
2018.75	154508	0.800	0.000	0.000	1.280	0.770	0.880
2019.00	272592	3.070	0.000	0.000	2.260	1.360	0.960
2019.25	267037	0.410	0.300	0.930	2.220	1.330	0.870
2019.50	283476	3.120	0.150	0.470	2.350	1.410	0.820
2019.75	251063	1.220	0.000	0.000	2.080	1.250	0.830
2020.00	303837	0.620	0.000	0.000	2.520	1.510	0.910
2020.25	289262	0.590	0.190	0.600	2.400	1.440	0.890
2020.50	212274	0.580	0.060	0.190	1.760	1.060	0.840
2020.75	161823	1.170	0.000	0.000	1.340	0.810	0.860
2021.00	135414	1.290	0.000	0.000	1.120	0.670	0.910
2021.25	133919	1.230	0.240	0.740	1.110	0.670	0.870
2021.50	154933	1.080	0.010	0.020	1.290	0.770	0.860
2021.75	180893	1.510	0.000	0.000	1.500	0.900	0.920
2022.00	190440	1.270	0.000	0.000	1.580	0.950	0.960
2022.25	193741	0.400	0.190	0.600	1.610	0.970	0.900
2022.50	194393	2.340	0.010	0.030	1.610	0.970	0.880
2022.75	168645	1.320	0.000	0.000	1.400	0.840	0.910
2023.00	217864	0.410	0.000	0.000	1.810	1.090	0.960
2023.25	221150	0.340	0.240	0.750	1.840	1.100	0.880
2023.50	163587	0.810	0.030	0.080	1.360	0.810	0.810
2023.75	120852	1.000	0.000	0.000	1.000	0.600	0.840

References

Canales M.C and Sánchez N, 2024. Evaluación de los stocks de anchoveta (*Cetengraulis mysticetus*) y arenque (*Opisthonema spp*.) en el Golfo de Panamá, 1995-2023. https://cedepesca.net/wp-content/uploads/2025/05/V1-Informe_EvaluacionStocks_PP_Panama_2024.pdf

A3.3	**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).**
Outcome	*Pass*

Rationale

The main mechanisms by which total removals are currently restricted are seasonal closures and restrictions on total fishing licences.

The stock is managed under the small pelagic management plan (RESOLUCIÓN ADM/ARAP No.027, 2018). According to the plan, the fishing season typically runs from April 11 to October 31. During this time, fish migrate to shallower waters, making them more accessible to the fleet. Toward the end of this period, they begin moving away, naturally initiating a fishing pause of about six months while they head to spawning grounds in coastal or shallower areas, during which no fishing activities take place.

Before the season begins, a technical pre-season report on small pelagic species is reviewed to assess whether the average length of the Pacific anchoveta and thread herring exceeds the minimum legal size of 12.5 cm for Pacific anchoveta and 17cm for thread herring as outlined in Executive Decree No. 107 (March 29, 2016). This decision relies heavily on data collected by the Directorate General for Research and Development. Hydroacoustic surveys are conducted before the fishing season. The fishing season starts and the TACs are set taking into consideration the data collected during the survey, which is usually biomass estimates, size structure, etc.).

The decision to close the season is based on scientific findings gathered during the fishing period and is formalized through a resolution issued by the Directorate General for Fisheries Planning and Management. According to the management plan the fishing season for Pacific anchoveta the fishery closes when the CPUE drops below 15% of the initial CPUE or when spawning begins—whichever comes first. Thus, these criteria can be considered a management trigger or harvest control threshold, which results on a management action being taken by the authority for the Pacific anchoveta and it has been respected (RESOLUCIÓN DGOMI No. 381-2023, RESOLUCIÓN DGOMI No. 152-2022, for example).

Historically, the biomass of the stock has been above or around Bmsy (Figure 4) and fishing mortality has been below the Fmsy (Figure 3).

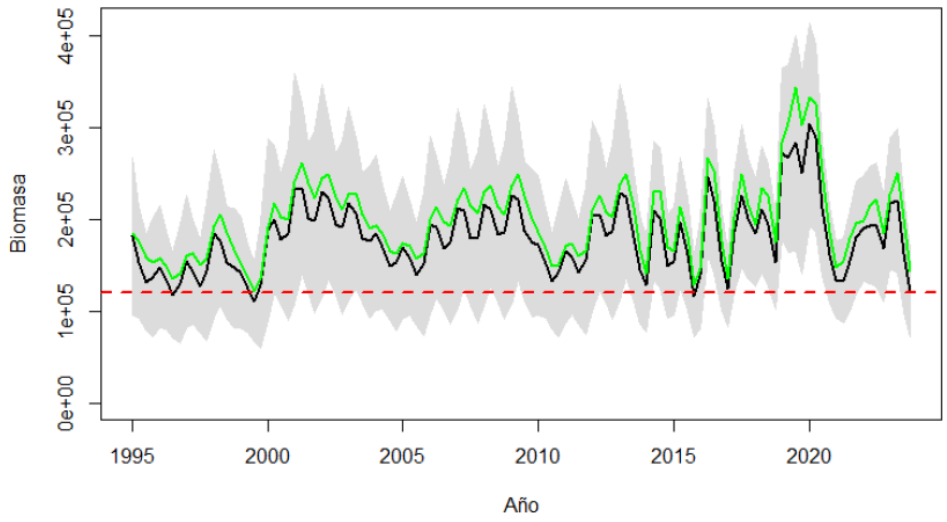

Figure 4. Biomass variation across the years of Pacific anchoveta. Parental/virginal adult biomass (green line), current biomass (black line) and Bmsy (red line) (Canales and Sánchez, 2024).

References

Canales M.C and Sánchez N, 2024. Evaluación de los stocks de anchoveta (*Cetengraulis mysticetus*) y arenque (*Opisthonema spp*.) en el Golfo de Panamá, 1995-2023. https://cedepesca.net/wp-content/uploads/2025/05/V1-Informe_EvaluacionStocks_PP_Panama_2024.pdf

Executive Decree 107 of May 2016. https://www.fao.org/faolex/results/details/es/c/LEX-FAOC164002/

RESOLUCIÓN ADM/ARAP No.027, 2018. Plan de Manejo de la Pesquería de Pequeños Pelágicos, anchoveta (*Cetengraulis mysticetus*), arenque (*Opisthonema* sp.) y orqueta (*Chloroscombrus orqueta*) en el Pacífico de Panamá, 2018. https://faolex.fao.org/docs/pdf/pan180840.pdf

RESOLUCIÓN DGOMI No. 152-2022, por la cual se establece el cierre de la temporada de pesca de la Anchoveta (*Cetengraulis mysticetus*) del año 2022. https://www.gacetaoficial.gob.pa/pdfTemp/29588/GacetaNo_29588_20220728.pdf

RESOLUCIÓN DGOMI No. 381-2023, por la cual se establece el cierre de la temporada de pesca de la Anchoveta (*Cetengraulis mysticetus*) del año 2023. https://faolex.fao.org/docs/pdf/pan223223.pdf

Pacific anchoveta (*Cetengraulis mysticetus*)

A4 Stock status

A4.1	**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.**
Outcome	*Pass*	

Rationale

On the last stock assessments performed in 2020 and 2024, the target reference point for the biomass has been determined as a spawning biomass equal to 60% of the virgin spawning biomass was used as a proxy for Maximum Sustainable Yield (Canales 2020, Canales and Sánchez, 2024). A Blim of 20% of the virgin biomass was also established by Canales 2020, although the review conducted by Minte-Vera 2021 indicated that this last value was not conservative enough for key stocks. No Blim was mentioned in the last stock assessment (Canales and Sánchez, 2024), however Cristian Canales Ramirez clarified by email (C.C Ramirez, personal communication, 13rd May 2025) to the assessment team that it has been considered a Blim=50%BMSY; Blim = 0.3 x B0 and sent a table of the biological reference points as provided on Table 4 below.

Table 4. Biological reference points for Panama's small pelagic resources provided by Cristian Canales Ramirez, who was been working in the stock assessments of the small pelagic fishery. Estimates are quarterly.

	anchoveta	arenque
B_0 (t)	185.538	24.653
PBRO=B_{MSY} = 60%B_0 (t)	111.323	17.792
PBRL=50%B_{MSY} (t)	55.661	7.396
MSY (t)	42.508	8.128
F_{MSY} (1/trim)	0,321	0,071

The 2024 assessment concluded that the Pacific anchoveta biomass was above the reference

biomass (BMSY) of 110,000 metric tons. The reproductive potential was estimated to be around 180,000 tons, which would be 90% of the adult biomass that would have existed without fishing. The conclusion was that the population was above the reference target and beyond the risk of overfishing and overexploitation (Figure 5), as revealed by the sensitivity analysis of seven alternative models performed in the last stock assessment (Canales and Sánchez, 2024).

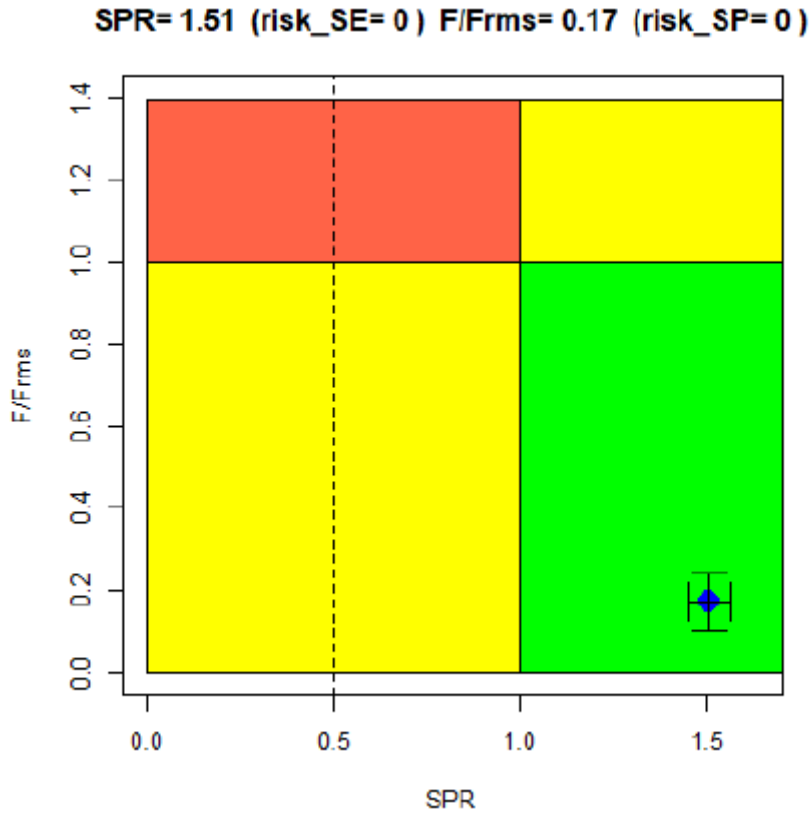

Figure 5. Kobe diagram for Pacific anchoveta (the average value in 2023 is considered) (Canales and Sánchez, 2024).

However, according to the most recent acoustic cruise, the Pacific anchoveta biomass at the end of March 2025 was estimated at 84,000 tons, thus below the reference biomass. If the Blim of 30% is used in Canales (2020) and the reference biomass of 110,000 tons from (Canales and Sánchez, 2024) are applied, Blim would be 33,000 tons, thus the stock in 2025 is estimated to be well above the Blim, although is 20% below the target reference point. As explained in A.3.3, the fishing closure is based on CPUE and time of the start of the spawning, thus it is considered that a fall below the limit reference point would result in fishery closure.

References

Canales M.C and Sánchez N, 2024. Evaluación de los stocks de anchoveta (*Cetengraulis mysticetus*) y arenque (*Opisthonema spp*.) en el Golfo de Panamá, 1995-2023. https://cedepesca.net/wp-content/uploads/2025/05/V1-Informe_EvaluacionStocks_PP_Panama_2024.pdf

Canales 2020. Evaluación de los stocks de anchoveta (*Cetengraulis mysticetus*) y arenque (*Opisthonema sp*.) en el Golfo de Panama. CeDePesca. 48 pp. https://cedepesca.net/wp-

content/uploads/2020/03/Informe_Evaluaci%C3%B3nStocks_PP_Panama-Canales-CeDePesca.pdf

Valdez, C., Iriarte, F., Escobar. C., Fuertes, J. 2024. “Evaluación Hidroacústica de recursos pelágicos en la Bahía de Panamá a bordo de la E/P Anchovetas II del 15 al 21 de marzo de 2025”. Informe ejecutivo, 45 pp.

Category A species

1. All clauses must be met for a species to pass the Category A assessment.

1.1.1. If a species fails any of the Category A clauses, it should be re-assessed as a Category B species.

Thread herring (*Opisthonema sp*.)

A1 Data collection

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

Rationale

Catch data per trip between 1995 and 2023 was used to assess the status of the stock in 2024 (Figure 1) (Canales and Sánchez, 2024). During the 2024 fishing season, 31,284.8 t of thread herring were landed, according to data provided by the MarinTrust applicant (Table 1).

References

Canales M.C and Sánchez N, 2024. Evaluación de los stocks de anchoveta (*Cetengraulis mysticetus*) y arenque (*Opisthonema spp*.) en el Golfo de Panamá, 1995-2023. https://cedepesca.net/wp-content/uploads/2025/05/V1-Informe_EvaluacionStocks_PP_Panama_2024.pdf

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

Rationale

Monitoring and collection of biological-fishing data have been carried out by ARAP and by CeDePesca, with industry support since the mid-nineties. Recently, the fishing companies "Promarina" and "Probasa" have financed the development of six acoustic cruisers with the aim of making biomass estimates available for the purpose of management recommendations (Canales and Sánchez, 2024).

Despite some issues with data from acoustic survey, sufficient additional information is collected to allow for an indication of stock status to be estimated. Data from landings, CPUEs, size classes, and hydroacoustic biomass estimates are complemented by onboard observer data collected during the fishing season, including size, weight, maturity, and CPUEs. These multiple sources were used in the 2024 stock assessment, with findings directly informing management advice and regulations through the General Directorate of Research and Development.

Although the 2024 assessment (Canales and Sánchez, 2024) noted that acoustic biomass estimates may be overestimated—by about 5% for anchoveta and 20% for herring—due to survey timing and changes in size-specific availability, the overall data still provide meaningful

insights into stock conditions. CeDePesca has informed the assessment team that a consultancy is predicted on 2025 to evaluate the best time and strategy for hydroacoustic assessment. Finally, the fleet's selectivity appears to target individuals at or above maturity size, reducing the risk of recruitment overfishing.

Recent data reinforce the utility of these monitoring efforts. According to the last acoustic cruise, thread herring at the end of March 2025 was 81,000t. The thread herring consisted of individuals with sizes ranging between 10.0 cm and 21.0 cm total length (LT), with a main adult mode of 12.0 cm (Valdez *et al*., 2024).

References

Canales M.C and Sánchez N, 2024. Evaluación de los stocks de anchoveta (*Cetengraulis mysticetus*) y arenque (*Opisthonema spp*.) en el Golfo de Panamá, 1995-2023. https://cedepesca.net/wp-content/uploads/2025/05/V1-Informe_EvaluacionStocks_PP_Panama_2024.pdf

Ceballes, A., Palacios, M. & Palacios, M. 2024. INFORME TÉCNICO PROGRAMA PRIVADO DE OBSERVADORES A BORDO. Pesquería de Pequeños Pelágicos de Panamá. Temporada 2023. CeDePesca. 50 pp.

Valdez, C., Iriarte, F., Escobar. C., Fuertes, J. 2024. "Evaluación Hidroacústica de recursos pelágicos
en la Bahía de Panamá a bordo de la E/P Anchovetas II del 15 al 21 de marzo de 2025". Informe ejecutivo, 45 pp.

A2 Stock assessment
Thread herring (*Opisthonema sp*.)

A2.1	**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.**
Outcome	*Pass*

Rationale

Stock assessments for Pacific anchoveta and thread herring were conducted in 2015, 2016, 2020 and 2024. In addition, before the annual fishing season, the authorities (ARAP) in collaboration with ALBOR tecnologico and CeDePesca conduct a hydroacoustic survey to assess the status of the stocks and based on that information a potential catch for the fishing season is estimated. Data from landings, CPUEs, size classes, and hydroacoustic biomass estimates are complemented by onboard observer data collected during the fishing season, including size, weight, maturity, and CPUEs. These multiple sources were used in the 2024 stock assessment (Canales and Sánchez, 2024), with findings directly informing management advice and regulations through the General Directorate of Research and Development.

References

Canales M.C and Sánchez N, 2024. Evaluación de los stocks de anchoveta (*Cetengraulis mysticetus*) y arenque (*Opisthonema spp*.) en el Golfo de Panamá, 1995-2023. https://cedepesca.net/wp-content/uploads/2025/05/V1-Informe_EvaluacionStocks_PP_Panama_2024.pdf

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

Rationale

The Biological Reference Points (BRPs) for thread herring were estimated by projecting the biomass quarterly over the long term for different values of average annual fishing mortality. A management objective has been established for these stocks to ensure that at least 60% of the virgin biomass (Target reference point) is kept for the stock. Hydroacoustic surveys are carried out before the fishing season to provide an estimation of the biomass and inform the maximum allowable catch for the season. In the last stock assessment, a proxy for Maximum Sustained Yield, was estimated as a spawning biomass Bmsy = 40 thousand tonnes. The fishing mortality that allows this management objective was estimated as Fmsy=0.071 by quarter-term (Canales and Sánchez, 2024).

References

Canales M.C and Sánchez N, 2024. Evaluación de los stocks de anchoveta (*Cetengraulis mysticetus*) y arenque (*Opisthonema spp*.) en el Golfo de Panamá, 1995-2023.

https://cedepesca.net/wp-content/uploads/2025/05/V1-Informe_EvaluacionStocks_PP_Panama_2024.pdf

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

Rationale

The most recent stock assessment estimates appropriate levels of fishery removals based on the current status of the thread herring populations. This is the second assessment to incorporate several key recommendations from Minte-Vera (2021) peer-review, using comprehensive data spanning from 1995 to 2023. The Biological Reference Points (BRPs) for thread herring were estimated by projecting the biomass quarterly over the long term for different values of average annual fishing mortality. The analysis included daily catch data per vessel to develop a relative abundance index, and modelled population dynamics quarterly for each species, incorporating size composition to detect trends in recruitment and the impacts of fishing mortality (Canales and Sánchez, 2024).

The models were tested under various biological assumptions, including natural mortality, growth, and potential hyper-stability in CPUE data. A spawning biomass equal to 60% of the virgin spawning biomass was used as a proxy for Maximum Sustainable Yield. Seven additional model scenarios were explored to assess structural uncertainty in thread herring estimates. In any of the cases analyzed, the condition of the thread herring population did not differ, being favourable and above the reference biomass in the most recent years (Canales and Sánchez, 2024). Canales and Sánchez (2024) informed that although the base model showed a tendency to underestimate biomass (by 0.8% for anchovy and 13% for herring) and overestimate fishing mortality (by 0.9% for anchovy and 8% for herring), these values were considered within acceptable bias levels (Carvalho *et al*., 2021). Furthermore, Canales (2020) affirmed that the stock had never shown signs of overexploitation.

References

Canales M.C and Sánchez N, 2024. Evaluación de los stocks de anchoveta (*Cetengraulis mysticetus*) y arenque (*Opisthonema spp*.) en el Golfo de Panamá, 1995-2023. https://cedepesca.net/wp-content/uploads/2025/05/V1-Informe_EvaluacionStocks_PP_Panama_2024.pdf

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

Rationale

In 2020, the assessment of the Panamanian pelagic fishery was reviewed by Minte-Vera 2021. A number of short-and medium-term recommendations were given in the review to improve the assessment of the stocks. The 2024 stock assessment used recommendations from Minte-Vera 2021 (Canales and Sánchez, 2024).

References

Canales M.C and Sánchez N, 2024. Evaluación de los stocks de anchoveta (*Cetengraulis mysticetus*) y arenque (*Opisthonema spp*.) en el Golfo de Panamá, 1995-2023. https://cedepesca.net/wp-content/uploads/2025/05/V1-Informe_EvaluacionStocks_PP_Panama_2024.pdf

Minte-Vera, C.V. 2021. Revisión por pares de la evaluación de los stocks de anchoveta (*Cetengraulis mysticetus*) y arenques de hebra (*Opisthonema* spp.) en el Golfo de Panamá 2021 (informe no-publicado. 35 pgs).

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

Rationale

The 2020 stock assessment can be accessed from the CeDePesca website: https://cedepesca.net/wp-content/uploads/2020/03/Informe_Evaluaci%C3%B3nStocks_PP_Panama-Canales-CeDePesca.pdf
The 2024 stock assessment was made available under request by CeDePesca through contact by the MarinTrust applicant in the following link: https://cedepesca.net/wp-content/uploads/2025/05/V1-Informe_EvaluacionStocks_PP_Panama_2024.pdf and now it is possible to find in on google search.

References

Canales 2020. Evaluación de los stocks de anchoveta (*Cetengraulis mysticetus*) y arenque (*Opisthonema* sp.) en el Golfo de Panama. CeDePesca. 48 pp https://cedepesca.net/wp-content/uploads/2020/03/Informe_Evaluaci%C3%B3nStocks_PP_Panama-Canales-CeDePesca.pdf

Canales M.C and Sánchez N, 2024. Evaluación de los stocks de anchoveta (*Cetengraulis mysticetus*) y arenque (*Opisthonema spp*.) en el Golfo de Panamá, 1995-2023. https://cedepesca.net/wp-content/uploads/2025/05/V1-Informe_EvaluacionStocks_PP_Panama_2024.pdf

A3 Harvest strategy
Thread herring (*Opisthonema sp*.)

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

Rationale

Article 15 of Executive Decree No. 107 of March 2016 indicates that the opening of the small pelagic fishing season will be carried out every year by resolution of the ARAP considering the availability of the resource and the size structures of the target species. That information is

collected through biological samplings, carried out in a pre-season fishing survey, which is conducted by Albor Tecnológico, support by the fishmeal and fish oil processing companies and coordinated by the ARAP (CeDePesca 2021).

The fishing season starts when the average size of the specimens of Pacific anchoveta and Pacific thread herring in each fishing ground is greater than sizes that have been historically considered as acceptable and which coincide with average size at first maturity in the literature (12.5 cm for Pacific anchoveta and 17 cm for Pacific thread herring). Pacific anchoveta is the first target species of the fishery until July, when spawning is about to reach its peak. From July onwards, Pacific thread herring becomes the target species until October, when weekly yields start to decrease, and the fishery is closed through an ARAP administrative resolution.

The fishery is closed by ARAP's resolution, according to the scientific reports based on the monitoring and research on the fishery during the season, as defined by Article 16 of Executive Decree No. 107 of March 2016. The Management plan predicts the prohibition of the thread herring catches when the average size is below 17 cm and some fishery closures have been established based on that, for example in 2022 and 2024 through Resolution DGOMI 271/2022 and Resolution DGOMI 357/2024. Other cases the closure was related to the increase of the fishing effort and landings, for example, in 2023 through Resolution DGOMI 453/2023. CeDePesca clarified by email that for thread herring, the fishery generally closes when catch rates fall below the level needed for economic viability (E. Godelman, personal communication, 13rd May 2025). However, a provisional limit of about 8,000 tons per quarter-term was set as a cap, based on the historical catch levels of the fishery, and this is predicted to be revised soon (C.C Ramirez, personal communication, 13rd May 2025).

Article 1 and Article 3 of Executive Decree 107 of May 2016 states that all vessels targeting anchoveta, herring, or bumper must possess and carry a fishing license issued for those species specifically. The total number of licenses available are a maximum of 20 licenses for large (industrial) vessels and 10 for small vessels. Small vessels must be below 8m in length, and must have a fish storage hold smaller than 3 cubic metres; industrial vessels are limited to a maximum hold size of 188 cubic metres. Licensed vessels of any size may only be replaced if completely removed from the fishery, and the new vessel will be issued the same licence number as the replaced vessel.

The stock is managed under the small pelagic management plan (RESOLUCIÓN ADM/ARAP No.027, 2018). Hydroacoustic surveys are conducted before the fishing season. The fishing season starts and the TACs are set taking into consideration the data collected during the survey (biomass estimates, size structure, etc.). The main mechanisms by which total removals are currently restricted are seasonal closures and restrictions on total fishing licences. The fishery is closed by the authorities based on the monitoring of the fishery.

References

CeDePesca 2021. Programa Privado de Observadores a Bordo.Pesquería de Pequeños Pelágicos de Panamá.Informe Preliminar #1/2021. 3 pp

Executive Decree 107 of May 2016. https://www.fao.org/faolex/results/details/es/c/LEX-FAOC164002/

Resolución ADM/ARAP No.027, 2018. Plan de Manejo de la Pesquería de Pequeños Pelágicos, anchoveta (*Cetengraulis mysticetus*), arenque (*Opisthonema* sp.) y orqueta (*Chloroscombrus orqueta*) en el Pacífico de Panamá, 2018.

https://faolex.fao.org/docs/pdf/pan180840.pdf

Resolution DGOMI 453/2023 por la cual se establece el cierre de la temporada de pesca del arenque (*Opisthonema* spp.) https://faolex.fao.org/docs/pdf/pan223224.pdf

Resolución DGOMI 357/2024, por la cual se establece el cierre de la temporada de pesca del arenque (*Opisthonema* spp.) https://vlex.com.pa/vid/resolucion-n-dgomi-357-1061198654

A3.2	**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.**
Outcome	*Fail*

Rationale

The trajectory of quarterly fishing mortality shows that it has varied seasonally. The fishing mortality at maximum sustainable level was estimated at Fmsy=0.071 (Canales and Sánchez, 2024). As it is shown on Figure 6 and Table 5Table 5 below, fishing mortality has been higher than the Fmsy several times in the past, exceeding 10%, as well as landings have been higher than the MSY (Figure 7). Thus, the stock failed in this clause and it will be assessed under Category B.

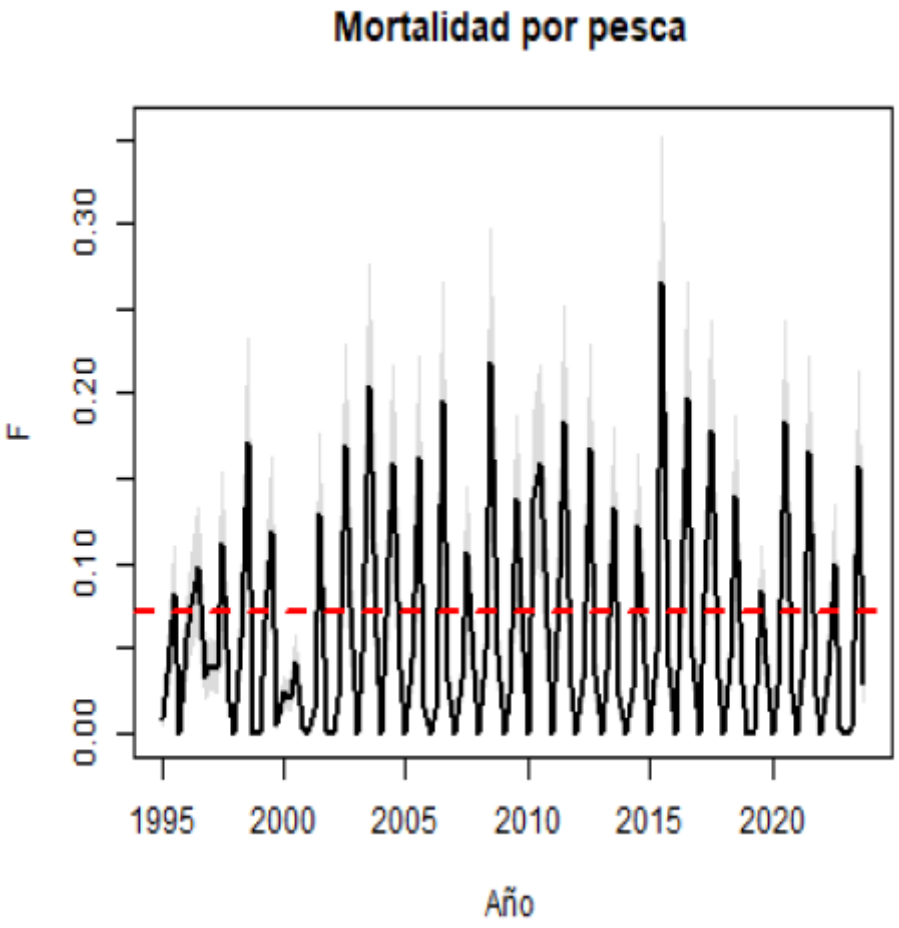

Figure 6. Quarterly variation in fishing mortality of thread herring. The red line indicates the Fmsy=0.071 (Canales and Sánchez, 2024).

Table 5. Estimates of adult biomass, recruitment, fishing mortality, virgin adult biomass reduction, and reproductive potential ratio of thread herring.

Año.trim	Biomasa	R_R0	Fcr	F_Fmrs	B_Brms	B_B0	SPR
2018.25	50319	0.990	0.040	0.610	1.240	0.740	0.670
2018.50	50716	1.580	0.140	1.950	1.250	0.750	0.660
2018.75	50949	1.600	0.030	0.400	1.260	0.750	0.650
2019.00	54681	0.770	0.000	0.000	1.350	0.810	0.690
2019.25	58532	0.660	0.000	0.020	1.440	0.870	0.730
2019.50	60243	0.760	0.080	1.170	1.490	0.890	0.740
2019.75	61470	0.810	0.040	0.590	1.520	0.910	0.740
2020.00	63854	0.810	0.000	0.000	1.580	0.950	0.760
2020.25	63572	0.810	0.030	0.380	1.570	0.940	0.780
2020.50	55710	0.810	0.180	2.570	1.370	0.820	0.730
2020.75	48491	0.710	0.020	0.350	1.200	0.720	0.680
2021.00	46757	0.770	0.000	0.000	1.150	0.690	0.700
2021.25	45379	0.740	0.050	0.680	1.120	0.670	0.710
2021.50	41163	0.960	0.170	2.330	1.020	0.610	0.670
2021.75	38128	1.210	0.020	0.310	0.940	0.560	0.650
2022.00	38547	1.080	0.000	0.000	0.950	0.570	0.680
2022.25	39194	1.080	0.030	0.450	0.970	0.580	0.710
2022.50	38881	1.940	0.100	1.400	0.960	0.580	0.710
2022.75	40569	1.430	0.000	0.040	1.000	0.600	0.720
2023.00	45355	2.200	0.000	0.000	1.120	0.670	0.770
2023.25	50902	0.750	0.000	0.040	1.260	0.750	0.810
2023.50	53725	0.740	0.160	2.220	1.330	0.800	0.790
2023.75	56720	0.910	0.030	0.410	1.400	0.840	0.760

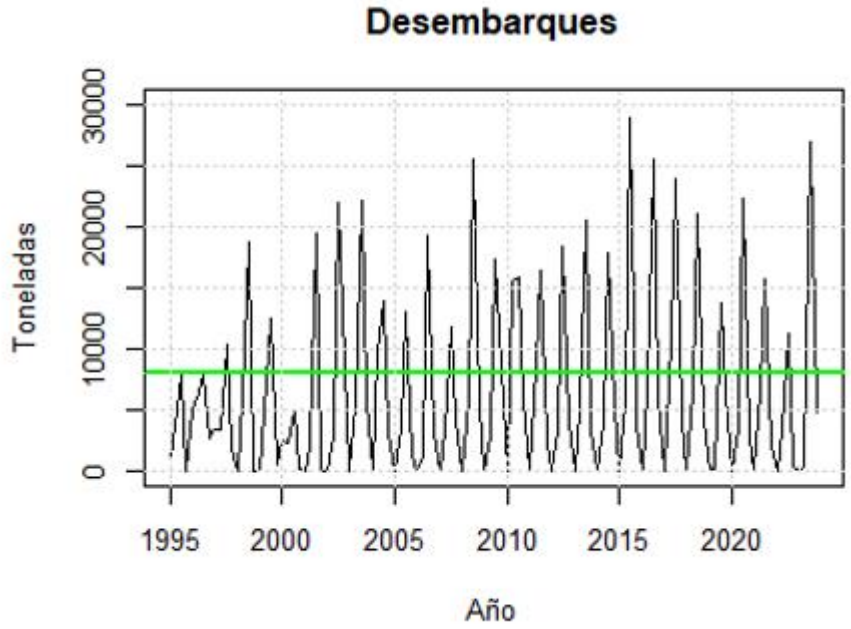

Figure 7. Quarterly landings of thread herring from 1995–2023. The green line corresponds to the MSY. Source: graphs sent by Cristian Canales Ramirez to the assessment team by email.

References

Canales M.C and Sánchez N, 2024. Evaluación de los stocks de anchoveta (*Cetengraulis mysticetus*) y arenque (*Opisthonema spp*.) en el Golfo de Panamá, 1995-2023. https://cedepesca.net/wp-content/uploads/2025/05/V1-Informe_EvaluacionStocks_PP_Panama_2024.pdf

A3.3	**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).**
Outcome	*Pass*

Rationale

The main mechanisms by which total removals are currently restricted are seasonal closures and restrictions on total fishing licences.

The fishery is closed by ARAP's resolution, according to the scientific reports based on the monitoring and research on the fishery during the season, as defined by Article 16 of Executive Decree No. 107 of March 2016. The Management plan predicts the prohibition of the thread herring catches when the average size is below 17 cm and some fishery closures have been established based on that, for example in 2022 and 2024 through Resolution DGOMI 271/2022 and Resolution DGOMI 357/2024. Other cases the closure was related to the increase of the fishing effort and landings, for example, in 2023 through Resolution DGOMI 453/2023.

Cristian Canales Ramirez provided to the assessment team some graphs comparing landing with Blim and Bmsy (Figure 8).

Although it is not clear on regulations neither on the management plan that the fishery would be closed if the stock is below the limit reference point or proxy, the stock has never reached this limit and there is evidence that management authorities have been monitoring and closing the fishery according to the status of the stock, fishing effort and landings, which can imply that actions will be taken if the biomass falls below the limit reference point.

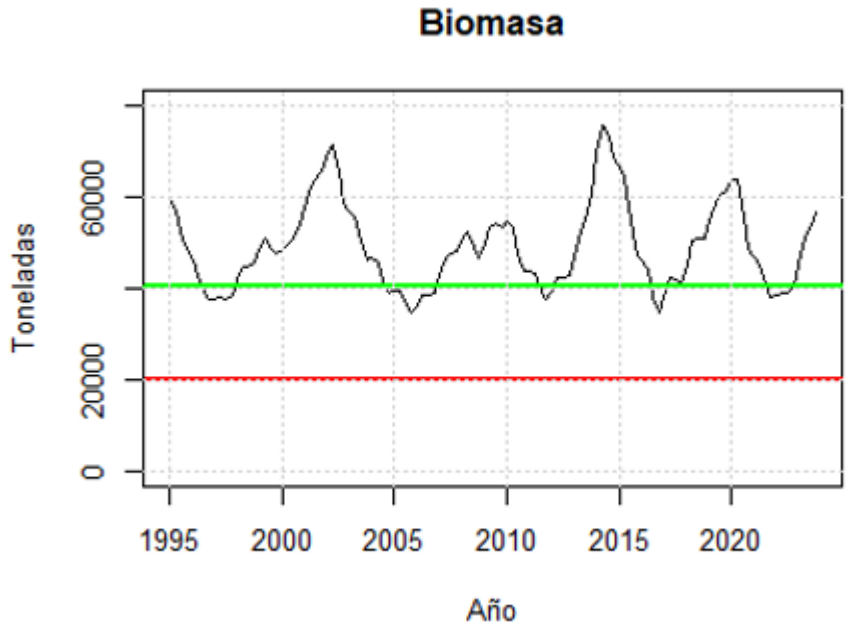

Figure 8. Biomass by quarterly for thread herring fishery from 1995-2023. The green line corresponds to Bmsy and the red line corresponds to Blim.

References

Canales M.C and Sánchez N, 2024. Evaluación de los stocks de anchoveta (*Cetengraulis mysticetus*) y arenque (*Opisthonema spp.*) en el Golfo de Panamá, 1995-2023. https://cedepesca.net/wp-content/uploads/2025/05/V1-Informe_EvaluacionStocks_PP_Panama_2024.pdf

Executive Decree 107 of May 2016. https://www.fao.org/faolex/results/details/es/c/LEX-FAOC164002/

Resolución ADM/ARAP No.027, 2018. Plan de Manejo de la Pesquería de Pequeños Pelágicos, anchoveta (*Cetengraulis mysticetus*), arenque (*Opisthonema* sp.) y orqueta (*Chloroscombrus orqueta*) en el Pacífico de Panamá, 2018. https://faolex.fao.org/docs/pdf/pan180840.pdf

Resolution DGOMI 453/2023 por la cual se establece el cierre de la temporada de pesca del arenque (*Opisthonema* spp.) https://faolex.fao.org/docs/pdf/pan223224.pdf

Resolución DGOMI 357/2024, por la cual se establece el cierre de la temporada de pesca del arenque (*Opisthonema* spp.) https://vlex.com.pa/vid/resolucion-n-dgomi-357-1061198654

A4 Stock status
Thread herring (*Opisthonema sp.*)

A4.1	**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.**
Outcome	*Pass*

Rationale

Canales and Sánchez (2024) estimated a biomass around 50,000 tons for thread herring and Bmsy of 43,000 tons. According to the last acoustic cruise, the thread herring biomass at the end of March 2025 was 81,000 t (Valdez, 2024). Thus, the stock is above the target reference point.

References

Canales M.C and Sánchez N, 2024. Evaluación de los stocks de anchoveta (*Cetengraulis mysticetus*) y arenque (*Opisthonema spp.*) en el Golfo de Panamá, 1995-2023. https://cedepesca.net/wp-content/uploads/2025/05/V1-Informe_EvaluacionStocks_PP_Panama_2024.pdf

Valdez, C., Iriarte, F., Escobar. C., Fuertes, J. 2024. "Evaluación Hidroacústica de recursos pelágicos
en la Bahía de Panamá a bordo de la E/P Anchovetas II del 15 al 21 de marzo de 2025". Informe ejecutivo, 45 pp.

Category B species

Category B species are assessed using a risk-based approach.

1.2. The risk matrix in Table B(a) shall be used when assessing a Category B species when estimates of Fishing mortality (F), Biomass (B) and reference points are available.

1.3. The risk matrix in Table B(b) shall be used when assessing a Category B species when no reference points are available.

B1	**Thread herring (*Opisthonema spp*.)**
Table used B(a) or B(b)	B(a)
Outcome	*Pass*

Rationale

On the last stock assessments performed in 2020 and 2024, the target reference point for the biomass has been determined as a spawning biomass equal to 60% of the virgin spawning biomass was used as a proxy for Maximum Sustainable Yield (Canales 2020; Canales and Sánchez, 2024). The 2024 assessment concluded that the thread herring biomass was above the reference biomass (Bmsy) of 40,000 tons. The reproductive potential was estimated to be around 50,000 tons, which would be 72% of the adult biomass that would have existed without fishing. However, according to the most recent acoustic cruise, the thread herring biomass at the end of March 2025 was estimated at 81,000 tonnes, being well above the reference biomass.

The fishing mortality that allows the management objective was estimated as Fmsy=0.071 and according to Canales and Sánchez (2024), the average fishing mortality levels of the thread herring corresponded to 50% of the Fmsy. The Kobe diagram showed that the overfishing risks were close to 10%, while overexploitation risks were zero (Figure 9).

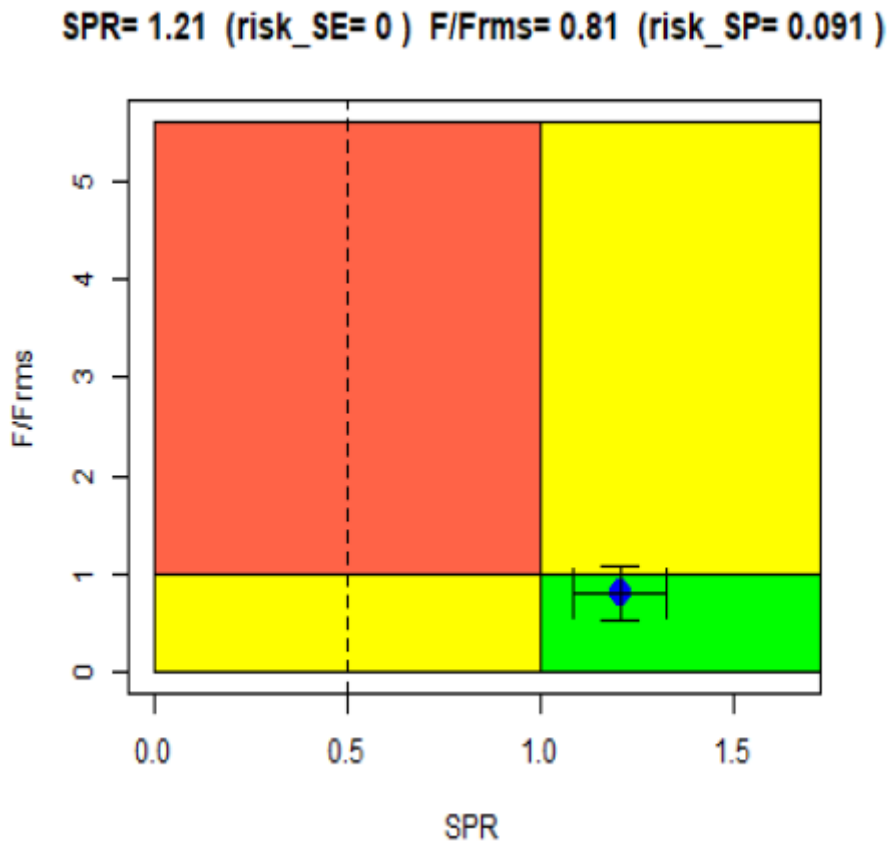

Figure 9. Kobe diagram for thread herring (Canales and Sánchez, 2024).

Therefore, as according to the last acoustic cruise performed in 2025, the biomass of thread herring is above MSY/target reference point and according to Canales and Sánchez (2024) the fishing mortality was below the Fmsy, the thread herring stock passed Table B(a).

References

Canales 2020. Evaluación de los stocks de anchoveta (*Cetengraulis mysticetus*) y arenque (*Opisthonema* sp.) en el Golfo de Panama. CeDePesca. 48 pp.

Canales M.C and Sánchez N, 2024. Evaluación de los stocks de anchoveta (*Cetengraulis mysticetus*) y arenque (*Opisthonema spp*.) en el Golfo de Panamá, 1995-2023. https://cedepesca.net/wp-content/uploads/2025/05/V1-Informe_EvaluacionStocks_PP_Panama_2024.pdf

Table B(a) – Biomass/fishing pressure risk assessment.

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

Category C species

1.4. All clauses must be met for a species to pass the Category C assessment.

1.4.1. Where a species fails this Category C clause, it should be assessed as a Category D species instead, except if there is evidence that the species is currently below the limit reference point.

C1.1	**C1.1 Fishery removals of the species in the fishery under assessment are included in the stock assessment process OR are considered by scientific authorities to be negligible.**
Outcome	Choose an item.
Rationale	
References	

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

Category D species

Category D species are assessed against a risk-based approach.

1.5. The Productivity-Susceptibility Analysis (PSA) in Table D(a) shall be used when assessing Category D species.

1.6. Table D(b) shall be used to calculate the overall PSA risk rating for the Category D species.

1.7. Should the PSA indicate a high risk, further assessment shall be completed against the requirements in Table D(C).

Productivity Susceptibility Analysis (PSA) and scores

Table D(a) provides detailed values and scores for the species productivity and susceptibility attributes and attributes, the assessor shall use Table D(a) to the PSA table.
Table D(b) is used to calculate the overall PSA risk rating for the Category D species.

Species name	Mexican barracuda (*Sphyraena ensis*)	
Productivity attributes	**Value**	**Score**
Average age at maturity	5.0	2
Average maximum age	24.0	2
Fecundity	Unknown	-
Average maximum size	130.1	2
Average size at maturity	66.1	2
Reproductive strategy	Broadcast spawner	1
Mean Trophic Level (MTL)	4.0	3
Density dependence (to be used when scoring invertebrate species only)	NA	-
Susceptibility attributes		
Areal overlap (availability): Overlap of the fishing effort with a species concentration of the stock	10-30	2
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	Medium overlap (neritic)	2
Selectivity of gear type: Potential of the gear to retain species	Unknown – Precautionary score	3
Post-capture mortality	Retained	3

(PCM): The chance that, if captured, a species would be released and that it would be in a condition permitting subsequent survival		
Average productivity score		2.00
Average susceptibility score		2.50
PSA risk rating (from Table D(b))		Further checks – criteria in Table D(c)
Compliance rating		Further checks – criteria in Table D(c)

Species name	Peruvian mojarra/*Palomillo aleta amarilla (Diapterus peruvianus/brevirostris*	
Productivity attributes	**Value**	**Score**
Average age at maturity	1-2 years[1]	1
Average maximum age	6[1]	1
Fecundity	16,695 to 807,954 oocytes twice a year[1]	1
Average maximum size	38 cm	1
Average size at maturity	13.53-13.68 cm[1]	1
Reproductive strategy	Broadcast spawner[1]	1
Mean Trophic Level (MTL)	3.0	2
Density dependence (to be used when scoring invertebrate species only)	NA	-
Susceptibility attributes		
Areal overlap (availability): Overlap of the fishing effort with a species concentration of the stock	10-30%	2
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	High (pelagic)	3
Selectivity of gear type:	Unknown – Precautionary	3

[1] Manuel Gallardo-Cabello, Elaine Espino-Barr2, Marcos Puente-Gómez, Arturo Garcia-Boa, and Esther G. Cabral-Solís. 2015. Reproduction of Diapterus brevirostris (Percoidei: Gerreidae) in the Mexican Pacific coast Global Journal of Fisheries and Aquaculture. https://www.globalscienceresearchjournals.org/articles/reproduction-of-diapterus-brevirostris-percoidei-gerreidae-in-the-mexican-pacific-coast.pdf

Potential of the gear to retain species	score	
Post-capture mortality (PCM): The chance that, if captured, a species would be released and that it would be in a condition permitting subsequent survival	Retained	3
Average productivity score		1.14
Average susceptibility score		2.75
PSA risk rating (from Table D(b))		Pass
Compliance rating		Pass

Species name	Pacific bumper/*orqueta* (*Chloroscombrus orqueta*)	
Productivity attributes	**Value**	**Score**
Average age at maturity	1.2 years	1
Average maximum age	4.7 years	1
Fecundity	Unknown	-
Average maximum size	31.5 cm	1
Average size at maturity	18.5 cm	1
Reproductive strategy	Broadcast spawner	1
Mean Trophic Level (MTL)	2.5	1
Density dependence (to be used when scoring invertebrate species only)	NA	-
Susceptibility attributes		
Areal overlap (availability): Overlap of the fishing effort with a species concentration of the stock	10-30%	2
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	High (pelagic)	3
Selectivity of gear type: Potential of the gear to retain species	Unknown – Precautionary score	3
Post-capture mortality (PCM): The chance that, if captured, a species would be	Retained	3

released and that it would be in a condition permitting subsequent survival		
Average productivity score		1.00
Average susceptibility score		2.75
PSA risk rating (from Table D(b))		Pass
Compliance rating		Pass

Species name	Hairfin lookdown/*Jorobado antena (Selene brevoortii)*	
Productivity attributes	**Value**	**Score**
Average age at maturity	1.6 years	1
Average maximum age	6.5 years	1
Fecundity	Unknown	-
Average maximum size	38 cm	1
Average size at maturity	22.8 cm	1
Reproductive strategy	Broadcast spawner	1
Mean Trophic Level (MTL)	3.8	3
Density dependence (to be used when scoring invertebrate species only)	NA	-
Susceptibility attributes		
Areal overlap (availability): Overlap of the fishing effort with a species concentration of the stock	10-30%	2
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	High (pelagic)	3
Selectivity of gear type: Potential of the gear to retain species	Unknown – Precautionary score	3
Post-capture mortality (PCM): The chance that, if captured, a species would be released and that it would be in a condition permitting subsequent survival	Retained	3
Average productivity score		1.33
Average susceptibility score		2.75
PSA risk rating (from Table D(b))		Pass

Compliance rating	Pass

Species name	Panama longfin herring/*sardina machete (Odontognathus panamensis)*	
Productivity attributes	**Value**	**Score**
Average age at maturity	1 year	1
Average maximum age	3.5 years	1
Fecundity	Unknown	-
Average maximum size	18.0 cm	1
Average size at maturity	11.2 cm	1
Reproductive strategy	Broadcast spawner	1
Mean Trophic Level (MTL)	3.8	3
Density dependence (to be used when scoring invertebrate species only)	NA	-
Susceptibility attributes		
Areal overlap (availability): Overlap of the fishing effort with a species concentration of the stock	10-30%	2
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	High (pelagic)	3
Selectivity of gear type: Potential of the gear to retain species	Unknown – Precautionary score	3
Post-capture mortality (PCM): The chance that, if captured, a species would be released and that it would be in a condition permitting subsequent survival	Retained	3
Average productivity score		1.33
Average susceptibility score		2.75
PSA risk rating (from Table D(b))		Pass
Compliance rating		Pass

Species name	White mullet/*lisa (Mugil curema)*	
Productivity attributes	**Value**	**Score**

Average age at maturity	2.7 years	1
Average maximum age	12.1 years	2
Fecundity	>20,000 eggs per year	1
Average maximum size	93.7 cm	1
Average size at maturity	49.3	2
Reproductive strategy	Broadcast spawner	1
Mean Trophic Level (MTL)	2.0	1
Density dependence (to be used when scoring invertebrate species only)	NA	-
Susceptibility attributes		
Areal overlap (availability): Overlap of the fishing effort with a species concentration of the stock	10-30%	2
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	Medium overlap (neritic)	2
Selectivity of gear type: Potential of the gear to retain species	Unknown – Precautionary score	3
Post-capture mortality (PCM): The chance that, if captured, a species would be released and that it would be in a condition permitting subsequent survival	Retained	3
Average productivity score		1.29
Average susceptibility score		2.75
PSA risk rating (from Table D(b))		Pass
Compliance rating		Pass

Further assessment for Category D species
Mexican barracuda (*Sphyraena ensis*)

Should the PSA indicate a high risk, further assessment shall be completed against the requirements D1 and D2 – Table D(c).

D1	**D1. The potential impacts of the fishery on this species are considered during the management process, and reasonable measures are**

	taken to minimise these impacts.
Outcome	*Pass*
Rationale Catch data is collected in the fishery. An on-board observer programme has also been implemented in recent years which has helped to improve the knowledge about the impact of the fishery on bycatch species. In general, bycatch levels in pelagic fisheries targeting small pelagic species are low. One of the main objectives (Objective 5) of the management plan for the small pelagic fishery in Panama indicates: "monitor the bycatch in the fishery and implement measures (if necessary)" (ARAP, 2018). In this case, it is considered that due to the relatively low impact of the fishery on these species and their healthy status no management measures are necessary. However, with the current better understanding of the impacts of fishery on this and other species, if the impact increases, it would be considered during the management process and measures would be implemented to minimise that impact.	
References ARAP 2018. Plan de manejo de la pesqueria de pequeños pelagicos anchoveta, arenque y orqueta en el Pacifico de Panama. 31pp.	

D2	**D2. There is no substantial evidence that the fishery has a significant negative impact on the species.**
Outcome	*Pass*
Rationale In this fishery the catch of Mexican barracuda (*Sphyraena ensis*) lookdown is low and it has not even reached the 0.1% threshold of catch composition to be evaluated under MarinTrust standard in previous year. In the last observer report, catches of this species were about 0.1% of the observed catch. This species is listed as Least Concern by the IUCN Red List (Robertson et al., 2010) and it has only felt on the Category D given the lack of information of its productivity attributes.	
References Robertson, R., Collette, B., Molina, H., Guzman-Mora, A.G. 2010. *Sphyraena ensis*. The IUCN Red List of Threatened Species 2010: e.T178106A7488815. https://dx.doi.org/10.2305/IUCN.UK.2010-3.RLTS.T178106A7488815.en. Accessed on 22 June 2025.	

Ecosystem requirements

This section, or module, assesses the impacts that the fishery under assessment may have on key ecosystem components: ETP species, habitat and the wider ecosystem.

2.1. All ecosystem criteria must be met (pass) for a fishery to pass the Ecosystem Requirements.

2.1.1. The sub-criteria offer a structured evidence base to demonstrate that the fishery sufficiently meets the ecosystem criteria, it is not expected that sub-criteria are

assessed independently of the main criterion.

E1 Impact on Endangered, Threatened or Protected species (ETP species)

E1.1	**E1.1 Information on interactions between the fishery and ETP species is collected.** *In reaching a determination for E1.1, the assessor should consider if the following is in place:*
	E1.1.1 ETP species which may be directly affected by the fishery have been identified.
	E1.1.2 Interactions between the fishery and ETP species are recorded and reported to management organisations.
	E1.1.3 Collection and analysis of ETP information is adequate to provide a reliable indication of the impact the fishery has on ETP species.
Outcome	*Pass*

Rationale

Interactions with ETP species are monitored by the On-Board Observer Program (OBOP) since 2016, including sea turtles, sharks, rays and seabirds. A number of observers have been trained and ID keys are used. The recording of data regarding the interaction with birds, mammals and marine reptiles is carried out throughout the fishing season, from the time the purse seine is extended until the capture is taken to the warehouse. The observer identifies the species, counts the number of individuals per species, and records in what state they fell or returned to the sea those individuals who interacted with the fishing gear and who could or could not be injured. During the 2024 fishing season which extended between 21st April and 17th October 2024, 70 trips and 276 hauls were monitored (CeDePesca, 2025)(Table 6)(Figure 10). A 20% coverage objective for operative vessels has been set by the management plan, but based on the data provided, it is unclear to which proportion of vessels or fishing trips that observer effort corresponds.

Table 6. Fishing trips observer by the OBOP (Ceballes et al., 2025).

Viajes de Pesca monitoreados	Abr	May	Jun	Jul	Ago	Sep	Oct	Total
	9	16	12	10	13	12	6	78
Embarcación	**Lances monitoreados por embarcación por mes**							**Total de lances por embarcación**
Bayano VII	34	39						73
Bayano VIII					11	15	11	37
Anchovetas				4				4
Anchovetas II	11		14	2	35	26		88
Celia M.	12			4			9	25
Ing. Vayarino			11					11
Isla Melones		8		5				13
Isla Santhelmo		7						7
La Maestra			5	3				8
Los Farallones							2	2
Promar							3	3
Tabor						5		5
Total Mensual	**57**	**54**	**30**	**18**	**46**	**46**	**25**	**276**

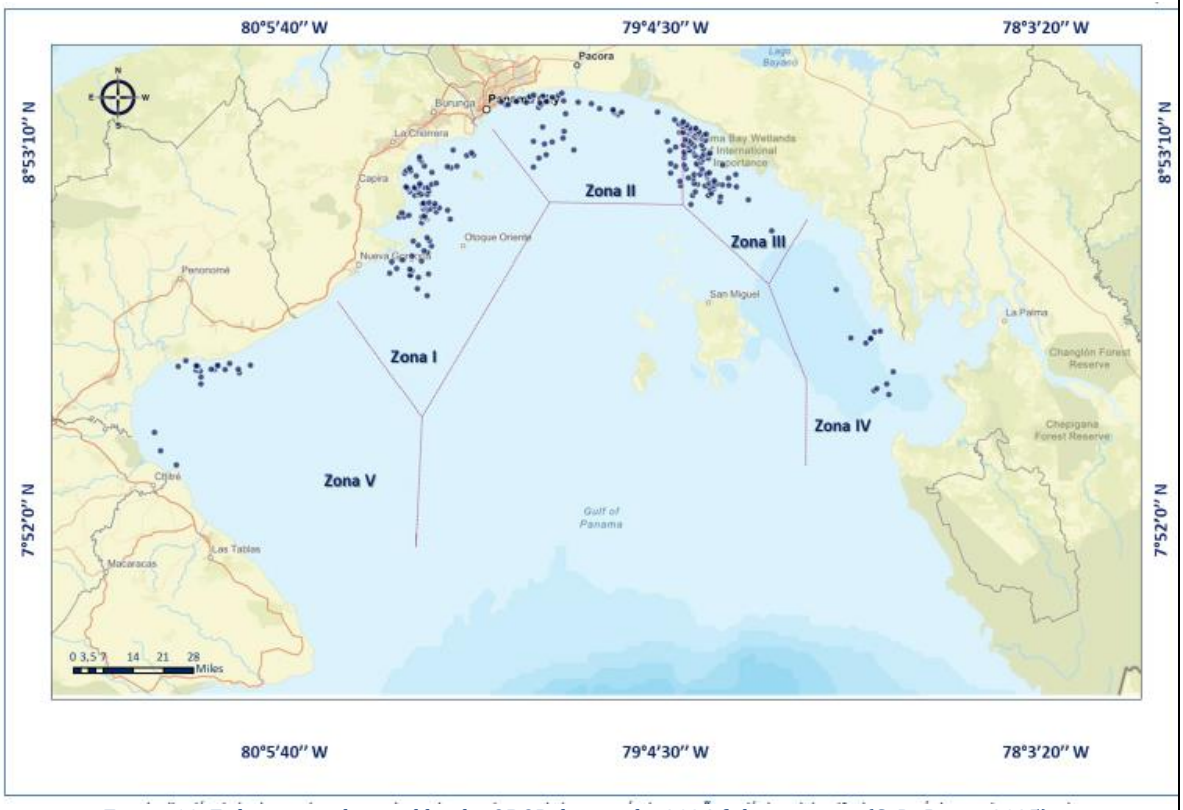

Figure 10. Fishing sets observed by the OBOP during the 2024 fishing season (CeDePesca, 2025).

References

CeDePesca. 2025. INFORME TÉCNICO PROGRAMA PRIVADO DE OBSERVADORES A

E1.2	**E1.2 The fishery has no significant negative impact on ETP species.** *In reaching a determination for E1.2, the assessor should consider if the following is in place:* E1.2.1 The information collected in relation to E1.1.3 indicates that the fishery does not have a significant negative impact on ETP species.
Outcome	*Pass*

Rationale

There is clear evidence of interactions with ETP species, however the impact is low. During the 2024 fishing season which extended between 21st April and 17th October 2024, 70 trips of 12 vessels and 276 hauls were monitored (CeDePesca, 2025).

Fishing interaction with at least one species of bird was recorded in 83% of sets, in 12% no interaction was recorded with any species and in the remaining 5% it was not possible to carry out observation given that the hauls were carried out in the evening hours, or environmental conditions did not allow it. Approximately 61,972 individuals observed grouped into 4 species and 3 undetermined taxa (CeDePesca, 2025). Most of interactions with injures were from *Pelecanus occidentalis*, 38 were reported dead (Table 7). However, this species is listed as Least Concern (Birdlife International 2018).

Table 7. Record of sea-coastal bird interactions observed by the OBOB of the small pelagic fishery in the Gulf of Panama during the 2024 season (CeDePesca, 2025)

SPECIES	Swimming or Flying Around the Boat	Resting on the Boat	Attacking the School to Feed and Escaped Unharmed	Dead	Released Uninjured	Released with Minor Injuries	Released with Serious Injuries	Total Individuals	Frequency of Occurrence
Pelecanus occidentalis	26110	596	5790	58	25	9	1	32589	77.8%
Fregata magnificens	12229	1487	2512	1	1			16231	84.7%
Phalacrocorax brasilianus	6290	16	1935	3	2			8305	46.7%
Leucophaeus atricilla	1900	10	1060					2960	10.7%
Unidentified Gull – *Larus* spp.	778	63	635					1413	10.8%
Phalacrocorax spp.	365	50	59					424	5.4%
Unidentified Gull	40		10					50	0.8%
Total Individuals	47712	2099	12062	62	27	9	1	61972	

38 individual sharks were registered in total by the scientific observers (Figure 11 and Figure 12), with the most representative species being: *Sphyrna lewini* (18 individuals), *Sphyrna*

corona (10 individuals), and the genus *Carcharhinus* sp. (4 individuals) (CeDePesca, 2025). *Sphyrna lewini* is listed as Critically endangered (Rigby et al., 2019) as well as *Sphyrna corona* (Pollom *et al*., 2020). However, these catch numbers are very much lower than in other fisheries operating in the area, such as the longline and gillnet fisheries (Yehudi Rodriguez 2013, Vega et al., 2023).

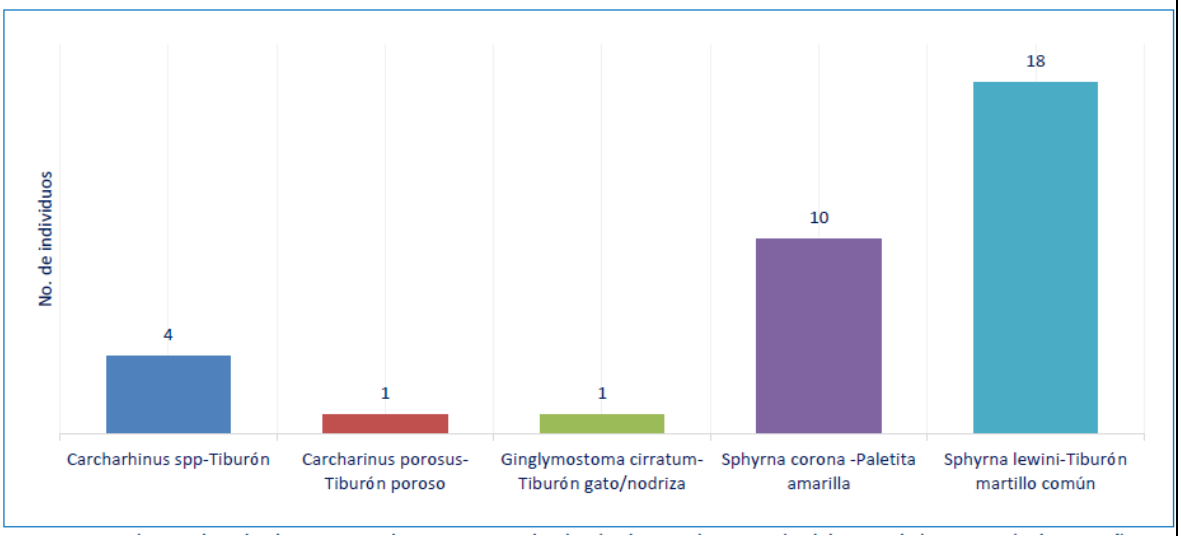

Figure 11. Number of individuals recorded per species of sharks during the execution of the OBOP of the small pelagic fishery in the Gulf of Panama in the 2024 seasons (CeDePesca, 2025).

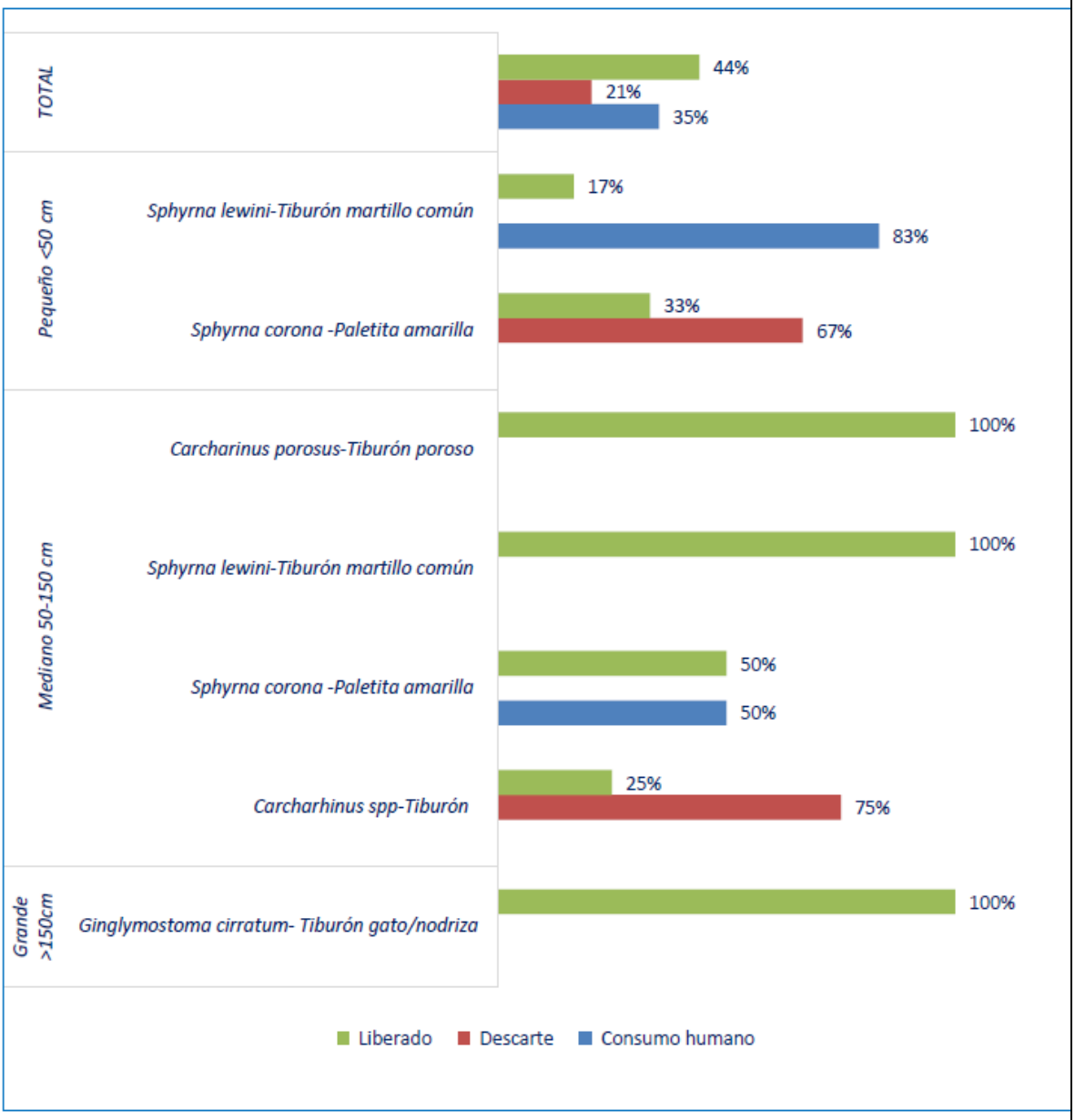

Figure 12. Fate and sizes of the shark species caught during the 2024 fishing season. Green colours represented the released specimens, red, the discarded and blue the ones used for human consumption (CeDePesca, 2025).

No interactions with turtles and marine mammals were reported by the OBOB in 2024.

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Yehudi Rodríguez, A. 2013. Análisis De La Situación Pesquera De Tiburones Para La Costa Pacífica De Panamá. 48 pp.

E1.3	**E1.3 There is an ETP management strategy in place for the fishery.** *In reaching a determination for E1.3, the assessor should consider if the following is in place:*	
	E1.3.1	There are measures applied to the fishery which are designed to manage the impacts of the fishery on ETP species.
	E1.3.2	The measures are considered likely to achieve the objectives of regional, national and international legislation relating to ETP species.
Outcome	*Pass*	

Rationale

As indicated above, the fishery interacts with sharks and seabirds.

To reduce the impacts of fisheries on sea turtles, Panama adopted the Declaration of the Inter-American Commission for the Protection and Conservation of Sea Turtles (CIT), which prohibits the retention of these species (via Law No. 8 of January 4, 2008). In addition, the creation of several Wildlife Refuge Areas with the purpose of protecting the nesting areas of sea turtles, for example on Isla Caña, La Barqueta Beach, La Marinera Beach as a special management area, among others, indicate State interest in conserving these species. These species are leased alive when caught.

Since 2022 there is in place the "National plan to reduce the incidental catch of seabirds in Panamá" (IATCC, 2022). The crew try to avoid the catch of birds and when caught (for example pelicans) they are released the as soon as possible. Marine-coastal bird workshop has also been conducted with fishermen to understand the impact of those species and how to minimise it (https://cedepesca.net/proyectos/panamanian-small-pelagics/).

For elasmobranch species, a number of workshops have been conducted in this fishery to improve data collection on interactions and release of bycatch specimens, and stakeholders in the fishery have also signed a voluntary code of conduct which includes among its objectives to comply with laws and regulations to protect ETP species and release them as soon as

possible. According to new information provided, the combination of observer education, workshops, and the Code of Conduct meant that in 2019 the majority of scalloped hammerhead bycatch was released alive (around 58%) (Archer & Peacock 2021). Furthermore, a collaboration agreement has been also recently established by Promarina with a shark specialist to launch a shark monitoring and release project to further improve these numbers (Crespo, 2024). There is also an ongoing study to define zones and time periods where this kind of bycatch is higher in order to analyze if it is worth avoiding these areas along the fishing season or even to create a protected area. However, the available information does not indicate that spatial or seasonal measures could minimize the impact on this species (CeDePesca 2021).

References

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E2 Impact on the habitat

E2.1	**E2.1 Information on interactions between the fishery and marine habitats is collected.** *In reaching a determination for E2.1, the assessor should consider if the following is in place:*	
	E2.1.1	Habitats which may be directly affected by the fishery have been identified, including any habitats which may be particularly vulnerable.
	E2.1.2	Information on the scale, location and intensity of fishing activity relative to habitats is collected.
	E2.1.3	Collection and analysis of habitat information is adequate to provide a reliable indication of the impact the fishery has on

	marine habitats.
Outcome	*Pass*

Rationale

The Pacific anchoveta occurs inshore, principally over mud flats. Apparently, it does not make long migrations along sandy or rocky areas (Di Dario 2020). Pacific thread herring is also a coastal pelagic fish found over soft substrate near the surface in both coastal and offshore waters (Cotto et al., 2010). The fishery occurs therefore in coastal areas where the gear can impact the seabed. Interactions with the seabed are reported by the observer program (CeDePesca, 2025). As seen in Figure 13 interactions mainly occurred on muddy areas and the impact of the gear on those areas is expected to be low.

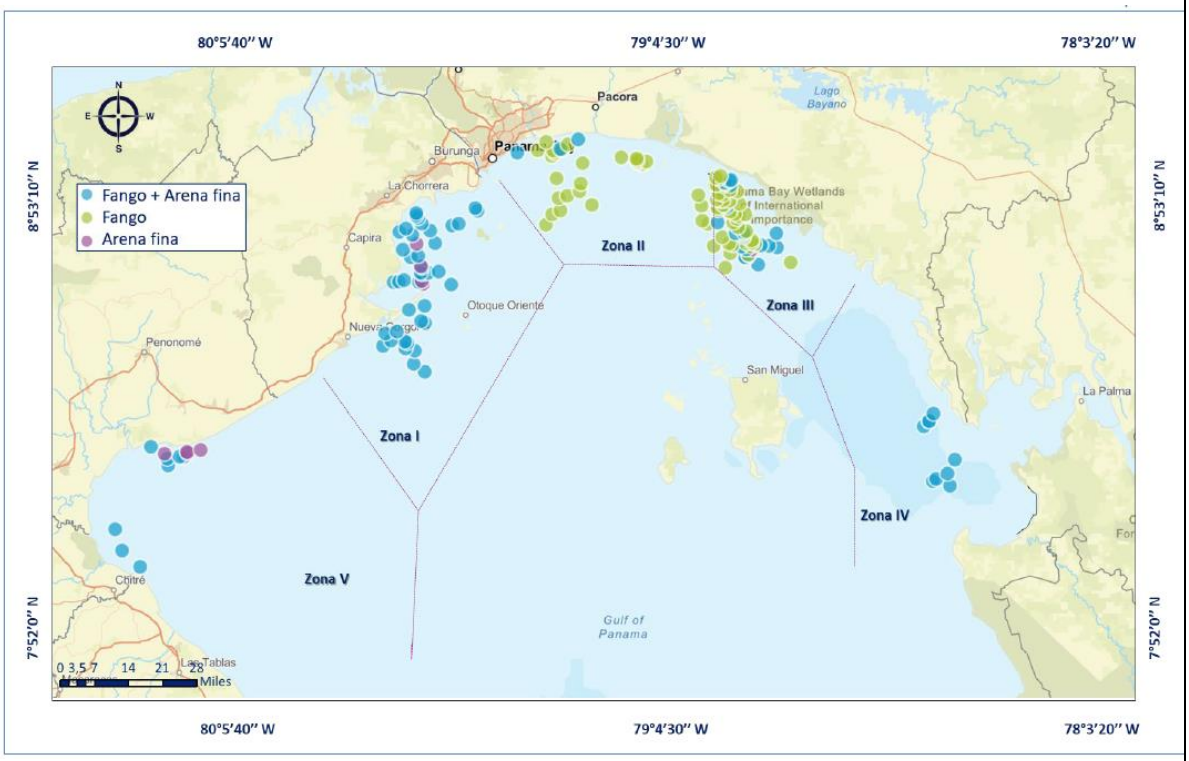

Figure 13. Interactions with the seabed during the 2024 fishing season (CeDePesca, 2025).

References

CeDePesca. 2025. INFORME TÉCNICO PROGRAMA PRIVADO DE OBSERVADORES A BORDO. Pesquería de Pequeños Pelágicos de Panamá. Temporada 2024. CeDePesca. 50 pp

Cotto, A., Medina, E., Bernal, O. 2010. *Opisthonema libertate*. The IUCN Red List of Threatened Species 2010: e.T183662A8154151. https://dx.doi.org/10.2305/IUCN.UK.2010-3.RLTS.T183662A8154151.en

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E2.2	**E2.2 The fishery has no significant impact on marine habitats.** *In reaching a determination for E2.2, the assessor should consider if the following is in place:*
	E2.2.1 The information collected in relation to E2.1.3 indicates that the fishery does not have a significant negative impact on marine habitats.
Outcome	*Pass*
Rationale Purse seine are designed to catch shoals of pelagic species and they use to operate in the water column without contacting the seabed. However, as this fishery occurs in coastal areas, purse seines for Pacific anchoveta and herring do contact the seabed (CeDePesca, 2025). On the other hand, the fishery occurs over mud where the impact is reduced, and a number of non-take zones have been established in order to protect the vulnerable habitats in the area (mangroves)[CeDePesca 2015]. Therefore, physical impacts of pelagic fisheries are considered insignificant.	
References CeDePesca. 2025. INFORME TÉCNICO PROGRAMA PRIVADO DE OBSERVADORES A BORDO. Pesquería de Pequeños Pelágicos de Panamá. Temporada 2024. CeDePesca. 50 pp CeDePesca 2015. Small Pelagic Fishery in Panama, Stock Assessment and Recommendations for a Management Plant.24 pp.	

E2.3	**E2.3 There is a habitat management strategy in place for the fishery.** *In reaching a determination for E2.3, the assessor should consider if the following is in place:*
	E2.3.1 There are measures applied to the fishery which are designed to manage the impact of the fishery on marine habitats.
	E2.3.2 The measures are considered likely to prevent the fishery from having a significant negative impact on marine habitats.
Outcome	*Pass*
Rationale A number of non-take zones have been implemented in Panama in order to protect mangroves and river mouths (CeDePesca 2015). The use of VMS in industrial vessels is currently mandatory which has improved compliance with these spatial measures. Furthermore, the use of purse seines in areas with hard bottoms is reportedly avoided by fishers, to limit gear damage. It also seems that very recently the country reached a 30% protection of its marine areas after protecting the Coiba ridge (https://mission-blue.org/2021/06/panama-achieves-30x30-ocean-protection-goals-in-newly-expanded-cordillera-de-coiba-marine-protected-area/).	
References	

CeDePesca 2015. Small Pelagic Fishery in Panama, Stock Assessment and Recommendations for a Management Plant.24 pp.

E3 Impact on the ecosystem

E3.1	**E3.1 Information on the potential impacts of the fishery on marine ecosystems is collected.** *In reaching a determination for E3.1, the assessor should consider if the following is in place:*	
	E3.1.1	The main elements of the marine ecosystems in the area(s) where the fishery takes place have been identified.
	E3.1.2	The role of the species caught in the fishery within the marine ecosystem is understood, either through research on this specific fishery or inferred from other fisheries.
	E3.1.3	Collection and analysis of ecosystem information is adequate to provide a reliable indication of the impact the fishery has on marine ecosystems.
Outcome	*Pass*	

Rationale

Small pelagic fish, often called forage fish due to their ecological role, are a crucial food source for top predators such as large fish, marine mammals, and seabirds (Cury et al. 2011; Ouled-Cheikh et al. 2022). In addition to being prey, they also consume significant amounts of phytoplankton and zooplankton, positioning them as important consumers at mid-trophic levels (Cury et al. 2000; Smith et al. 2011). These species form a key link in pelagic food webs by transferring energy from primary producers to higher trophic levels (Bakun et al. 2010). Their abundance and feeding behavior allow them to influence both the productivity of organisms below and above them in the trophic chain (Rice 1995). On average, small pelagic fishes support 22 % of seabird biomass, 15 % of mammal biomass, and 34 % of total fishery catches (Ruzicka et al., 2024).

Pacific anchoveta occurs inshore, principally over mud flats and forms large schools. Juveniles feed principally on diatoms, and also silico-flagellates, dinoflagellates and small crustaceans. Adults feed mainly on benthic diatoms and are oviparous with pelagic larvae. In Panama, this species is associated with upwelling events in the Gulf of Panama and migrate to shallower waters between February and April (Di Dario 2020). Pacific thread herring is a coastal pelagic fish is found over soft substrate near the surface in both coastal and offshore waters. It forms dense schools and feeds on phytoplankton (Cotto et al., 2010). Small pelagic species play a key role in the general health of marine ecosystems, as they feed from plankton and are a prey for other fish, birds, reptiles and marine mammals.

The on-board observer program currently in place collect data on ETP and habitat interactions, which is used to assess the impact of the fishery on those elements of the ecosystem and it has been show a low impact in both (CeDePesca 2025).

The cruises performed before the opening of the fishing seasons collect oceanographic and biological data in order to integrate estimates of the biomass and distribution of small pelagic fish through acoustic surveying, sample fishing, and oceanographic studies. In the last report of the cruise, principal component analyses suggested that Pacific anchoveta is more dependent on water column characteristics, while thread herring is more responsive to bathymetric factors and proximity to the coast. Furthermore, it was observed that Pacific anchoveta prefers warmer, saline waters, while thread herring is more sensitive to thermal changes, which could influence its distribution and abundance (Valdez et al., 2024).

References

CeDePesca. 2025. INFORME TÉCNICO PROGRAMA PRIVADO DE OBSERVADORES A BORDO. Pesquería de Pequeños Pelágicos de Panamá. Temporada 2024. CeDePesca. 50 pp

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Cury PM, Boyd IL, Bonhommeau S, Anker-Nilssen T and others. 2011. Global seabird response to forage fish depletion — one-third for the birds. Science 334: 1703– 1706

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Ouled-Cheikh J, Gimenez J, Albo Puigserver M, Navarro J and others. 2022. Trophic importance of small pelagic fish to marine predators of the Mediterranean Sea. Mar Ecol Prog Ser 696: 169–184

Rice J. 1995. Food web theory, marine food webs, and what climate change may do to northern marine fish populations. Publ Spec Can Sci Halieut Aquat 121: 561– 568

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Smith ADM, Brown CJ, Bulman CM, Fulton EA and others. 2011. Impacts of fishing low-trophic level species on marine ecosystems. Science 333: 1147– 1150

Valdez, C., Iriarte, F., Escobar. C., Fuertes, J. 2024. "Evaluación Hidroacústica de recursos pelágicos
en la Bahía de Panamá a bordo de la E/P Anchovetas II del 15 al 21 de marzo de 2025". Informe ejecutivo, 45 pp.

E3.2	**E3.2 There is no substantial evidence that the fishery has a significant negative impact on the marine ecosystem.** *In reaching a determination for E3.2, the assessor should consider if the following is in place:*
	E3.2.1 The information collected in relation to E3.1.3 indicates that the fishery does not have a significant negative impact on marine ecosystems.
Outcome	*Pass*

Rationale

In 2005/2006 the Smithsonian Institute and the Audubon Society STRI and the Audubon Society of Panama carried out a survey of marine and wading birds in the Gulf of Panama, estimating the total bird population in the area in more than 50,000 individuals that belong to 20 species. The pelican was the predominant species. That study indicated that interactions with the small pelagic fishery with seabirds during the nesting and feeding period was low due to the restricted (coastal) area of operation of the fishery, the between the fishery and the feeding season. And concluded: "there is no evidence in the long run of declining marine or wading birds in the Gulf of Panama" (Angehr et al, 2007) and fishing was not among the potential threats listed.

The on-board observer program currently in place collect data on ETP and habitat interactions, which is used to assess the impact of the fishery on those elements of the ecosystem and it has been show a low impact in both (CeDePesca 2025). The bycatch of other species is also low, no more than 2%.

References

Angehr, G. R. and J. A. Kushlan. 2007. Seabird and colonial wading bird nesting in the Gulf of Panamá. Waterbirds 30: 335–357. BioOne.

CeDePesca. 2025. INFORME TÉCNICO PROGRAMA PRIVADO DE OBSERVADORES A BORDO. Pesquería de Pequeños Pelágicos de Panamá. Temporada 2024. CeDePesca. 50 pp

E3.3	**E3.3 There is an ecosystem management strategy in place for the fishery.** *In reaching a determination for E3.3, the assessor should consider if the following is in place:*
	E3.3.1 There are measures applied to the fishery which are designed to manage the impacts of the fishery on marine ecosystems.
	E3.3.2 The measures are considered likely to prevent the fishery from having a significant negative impact on marine ecosystems.
Outcome	*Pass*

Rationale

In March 2021, a new fisheries law, Law 204/2021 was approved in Panama. Article 8 of the law lists the main objectives, among which is the application of the ecosystem approach to

regulation fishing activities in the country. In 2023, Executive Decree No. 13 regulated Law No. 204 of 2021 and reinforced the ecosystem approach as one of its principles. It also established general guidelines for the National Plan for the Conservation and Management of Fisheries and Aquaculture, as well as the National Fisheries and Aquaculture Policy, both of which must follow the ecosystem approach in accordance with Articles 7 and 2, respectively.

The stock assessments of Pacific anchoveta and thread herring use a precautionary biomass target of 60% of the virgin spawning stock biomass that was set as objective to account for the key role of these species, as the species in the trophic chain presupposes a greater escape of biomass compared to demersal species (CeDePesca 2025). The key role of the species is taking into consideration when recommending total permissible fishery removals.

The cruises performed before the opening of the fishing seasons seek the integration of biological and oceanographic information all for the design of efficient management strategies, ensuring the viability of these fisheries (Valdez et al., 2024).

References

CeDePesca. 2025. INFORME TÉCNICO PROGRAMA PRIVADO DE OBSERVADORES A BORDO. Pesquería de Pequeños Pelágicos de Panamá. Temporada 2024. CeDePesca. 50 pp

Decreto Ejecutivo Nº 13 - Reglamenta la Ley Nº 204 de 2021 que regula la pesca y la acuicultura en la República de Panamá y dicta otras disposiciones. https://www.fao.org/faolex/results/details/en/c/LEX-FAOC223225

Ley 204/2021 que regula la pesca y acuicultura en la República de Panamá y dicta otras disposiciones. https://cedepesca.net/wp-content/uploads/2021/08/Panama-Ley-de-Pesca-2021.pdf

Valdez, C., Iriarte, F., Escobar. C., Fuertes, J. 2024. "Evaluación Hidroacústica de recursos pelágicos
en la Bahía de Panamá a bordo de la E/P Anchovetas II del 15 al 21 de marzo de 2025". Informe ejecutivo, 45 pp.

Annex 1: External Peer Review report

Assessment and determination summary

Fishery name	**Panama – Pacific Anchoveta (Cetengraulis mysticetus) and Pacific Thread Herring (Opisthonema spp.) – FAO 77**
MarinTrust report code	**W20**
Type 1 species (common name, Latin name)	*Pacific Anchoveta (Cetengraulis mysticetus) and Pacific Thread Herring (Opisthonema spp.*
Fishery location	*Area FAO 77, Eastern Central Pacific, Panama (Gulf of Panama*
Gear type(s)	*Purse seine*
Management authority (country/state)	*Aquatic Resources Authority of Panama (Autoridad de los Recursos Acuáticos de Panamá - ARAP) Panamá*
Certification Body recommendation	*Approved*
FAPRG reviewer recommendation	*Agree with CB determination*

Summary of peer review outcomes

Summary *Provide any information about the fishery that the reviewers feel is significant to their decision. This summary is used by the Certification Body in the Fishery Assessment Report.*
The assessor has produced a clear, well-referenced report, offering thorough justification for all scoring decisions. The peer reviewer agrees with all the assessment outcomes and scores. Only minor comments provided.
General comments on the draft report provided to the peer reviewer
Thank you for your constructive inputs and considerations.

1. Has the fishery assessment been fully completed, using the recognised MarinTrust fishery assessment methodology and associated guidance?	Yes
2. Does the Species Categorisation section of the report reflect the best current understanding of the catch composition of the fishery?	Yes
3. Are the scores in the following sections consistent with the MarinTrust requirements (i.e. do the scores reflect the evidence provided)?	Yes
Section M – Management Requirements	Yes
Category A Species	Yes
Category B Species	Yes
Category C Species	n/a
Category D Species	See notes
Section E – Ecosystem Impacts	Yes

Detailed Peer Review Justification

1. Has the fishery assessment been fully completed, using the recognised MarinTrust fishery assessment methodology and associated guidance?	Yes
Yes, the MT assessment methodology has been adequately used.	
Certification Body response	
OK	

2. Does the species categorisation section of the report reflect the best current understanding of the catch composition of the fishery?	Yes
Yes, data and bycatch information from the private observer programme have been used to categorize the fishery. This is considered the best available and most up-to-date source of information.	
Certification Body response	
OK	

3. Is the scoring of the fishery consistent with the MarinTrust requirements, and clearly based on the evidence presented in the assessment report?	Yes
Yes, the scoring of the fishery is consistent with the MT standard and requirements. The evidence provided is adequate and the scores clearly justified	
Certification Body response	
OK	

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

Yes, but some ammendement need to be done. See my cooments below.
It's encouraging to see that the target stocks have finally been reassessed. I would recommend making this an annual practice, rather than conducting assessments only when the fishery faces the risk of losing its certification.
Anchoveta
According to Canales (2024) the stock is over the target reference point. However, I have a couple of relevant comments.
A1.2 Yes, the management system appears capable of detecting decreases in biomass. However, could you please confirm whether any precautionary management measures have been implemented in response to the most recent low biomass estimates?
A2.1 Could you please confirm whether the most recent biomass estimates from the surveys (Valdez et al., 2025) were not used by Canales (2024) in the stock assessment of anchoveta? Because I see that the biomass of the stock indicated in the last survey would be well below the Btarget.
Thread herring
It is particularly concerning that fishing mortality consistently exceeds the FMSY level, indicating that current management measures are failing to effectively control exploitation for this species. I agree that fishing mortality is above FMSY, and therefore the fishery does not meet the requirements of Clause A3.2.

Certification Body response

On my understanding, the stock assessment have been done, but not easily find online, For some reason, CeDePesca does no update information about this fishery on the website since 2021, but it seems the work the management of this fishery is very active, just hard to access the information.
A.1.2 I am not aware of other management measures that has been taken that was not reported on this assessment.
A.2.1 Canales (2024) was published on February 2024, thus, before the March 2025 cruise, which results were published on Valdez et al (2025) report.

3b. Are the “Category B Species” scores clearly justified?	Yes

No category B species initially identified but as thread herring failed category A, it was moved to category B. Justifications and associated scores seem to be adequate.

Certification Body response

OK

3c. Are the "Category C Species" scores clearly justified?	n/a
No category C species identified	
Certification Body response	
OK	

3d. Are the "Category D Species" scores clearly justified?	No
Seven species (Mexican barracuda (Sphyraena ensis), Peruvian mojarra/Palomillo aleta amarilla (Diapterus peruvianus/brevirostris), Pacific bumper/orqueta (Chloroscombrus orqueta), Hairfin lookdown/Jorobado antena (Selene brevoortii), Panama longfin herring/sardina machete (Odontognathus panamensis) and White mullet/lisa (Mugil curema) have been identified as category D species. But a PSA has been conducted only for six of them (please compare table 6 and the category D species section). Scores seem to be adequate based on the available scientific information. All assessed species except Mexican barracuda pass against table D(b). That last species is further assessed against the requirements D1 and D2 – Table D(c). There is also a typho in table D2, as it refers to another bycatch species, no mexican baracuda which is the one being assessed, please clarify that.	
Certification Body response	
Thank you for pointing that. I forgot to delete Pacific smalleye croaker/ guabina (Nebris occidentalis) from the list. It composed less than 0.1% of the catches, so it does not need to be assessed. I corrected the typho for D2 now.	

Are the scores in "Section M – Management Requirements" clearly justified?	Yes
The management of the fishery appears to be largely consistent with the previous year, with no significant changes observed since the last assessment. Just one minor comment: M2.3: I understand that the reference to IUU fishing pertains to the yellow card issued by the EU to the country in 2019—can you confirm if this is correct?	
Certification Body response	
Yes, I have claridied this now on the report.	

Are the scores in “Section E – Ecosystem Impacts” clearly justified?	Yes

Yes, the information provided appears to be generally adequate. Just a few comments:
E.1: It is concerning that, despite the fishery having signed a code of conduct, not all sharks caught are being released.
E.1.3: The following excerpt is taken from the previous report: "Furthermore, a collaboration agreement has also recently been established by Promarina with a shark specialist to launch a shark monitoring and release project to further improve these numbers (Crespo, 2024)." Do you know if any activities or progress have been made under this initiative?
E.2: The impact on the seabed appears to be limited.
E.3: Several management measures seem to be in place to reduce the fishery’s impact on the wider ecosystem, including the establishment of precautionary reference points for the target stocks

Certification Body response

Thank you for your points. I have been in contact with ARAP recently and I was informed that the Nactional Action Plan for sharks has been revised, but did not receive much more information from Promarina about it.

Optional: General peer reviewer comments on the draft report

The assessment determination rationale is very complete. Only one comment, Ithe following sentecne is unclear: "According to the management plan the close of the fishing season for Pacific anchoveta the fishery closes when the CPUE drops below 15% of the initial CPUE or when spawning begins—whichever comes first. Thus, these criteria can be considered the limit reference point or proxy for the Pacific anchoveta and it has been respected". I would recomemnd to correct/clarify it.
I would also say that more than a limit reference point, that 15% value seems to be a "management trigger or harvest control threshold" which results on a management action being taken by the authority.

Certification Body response

Thank you for pointing that, I have fixed the phrase for: "According to the management plan the fishing season for Pacific anchoveta the fishery closes when the CPUE drops below 15% of the initial CPUE or when spawning begins—whichever comes first. Thus, these criteria can be considered a management trigger or harvest control threshold that has been taken by the authority for the Pacific anchoveta and it has been respected.