By-Product assessment report

BP052

Tadel SA

Report code	BP052	Date of issue	July 2026

1. Application details		
Applicant	Tadel SA	
Applicant country	Ecuador	
2. Certification Body details		
Name of Certification Body (CB)	NSF / Global Trust Certification Ltd	
Contact information for CB	Fisheries@nsf.org	
Assessor name	Silvia Manglano Otaduy	
CB internal peer reviewer name	Matthew Jew	
Internal peer review evaluation	Agree with evaluation	
Number of Assessment days	0,2	
Comments on the assessment	This re-approval covers 6 by-product species: yellowfin and skipjack tuna, Pacific chub mackerel, Pacific thread herring, south pacific hake, and bullet tuna. They all originate under the flag state of Ecuador which is consider a High Risk in risk ranking at Step 2. They all have pass Step 3 Category C and through Path 2 traceability assessment and have been downgraded to "Approved source with caution" status. For the category C assessment some of the rationales were quoted from previous assessments. For yellowfin and skipjack, the assessment team used BP091 rationales, for the rest of species BP133 was used, except for South Pacific hake which had new and updated information. There was a verification on the information used, as the data used in the stock assessment was not updated, rationales were valid and correct.	
3. Approval validity	Valid from 07/2026	Valid until 07/2027
4. Assessment cycle	Re-Approval	

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5. By-product assessment outcomes			
By-product species name	**Flag country(ies)**	**Fishing Area(s)**	**MarinTrust approval status**
Yellowfin tuna *(Thunnus albacares)*	Ecuador	FAO 77 and 87	Approved source with caution
Skipjack tuna (*Katsuwonus pelamis*)	Ecuador	FAO 77 and 87	Approved source with caution
Pacific thread herring*/pinchagua (Opisthonema spp.)*	Ecuador	FAO 87	Approved source with caution
Pacific chub mackerel*/macarela (Scomber japonicus)*	Ecuador	FAO 87	Approved source with caution
South Pacific hake (*Merluccius gayi*)	Ecuador	FAO 87	Approved source with caution
Bullet tuna (*Auxis rochei*)	Ecuador	FAO 87	Approved source with caution

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Guidance for on-site auditor
For the audit, the auditor will check how the facility manages by-products deemed medium risk. Any by-products downrated from high to medium risk will require additional due diligence checks.

It is important that facilities check all raw materials from and verify their suppliers especially if there is a perceived risk of sourcing from known or suspected IUU fishing activity. This requires checking supplier records or procedures in place to understand how the supplier can ensure there is no IUU in the raw material they provide. For raw materials risk rated medium, additional or more frequent checks may be required until the facility is certain that the raw materials are not from IUU fishing activity.

The audit requirements are covered in clause 2.11.3 of the MarinTrust Global Standard for Responsible Supply of Marine Ingredients (the MarinTrust Standard) and associated interpretation guidance.

Approved by-products

- No further checks are required beyond those included in the MarinTrust Standard.

Additional checks of Approved Source with Caution by-products

- Review supplier records or procedures in place.

Additional checks of by-products Approved Source with Caution via Step 3 assessment

- In addition to checks for medium risk Approved Source with Caution by-products, by-products that have had risk downgraded from high to medium at Step 3 (use **Appendix 1** to identify these by-product species), confirm that the relevant traceability information continues to be collected for this by-product. During the audit, a traceability check on any by-products downgraded from high to medium risk shall be included as part of the required traceability checks (Section 4).

Guidance for the applicant/certificate holder
The applicant/certificate holder is responsible for ensuring the relevant actions are taken to comply with the MarinTrust Standard.
The certificate holder is responsible for communicating any changes to the by-products sourced by submitting a scope extension request through the MarinTrust online Application Portal.

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Appendix 1 – assessment outcomes

Step 2 Assessment Outcomes

By-product species name	Flag country(ies)	IUCN Red List	CITES Appendices	Step 2 risk status	Step 3 required?
Yellowfin tuna *(Thunnus albacares)*	Ecuador	Least concern	Not listed	High risk	Yes
Skipjack tuna *(Katsuwonus pelamis)*	Ecuador	Least concern	Not listed	High risk	Yes
Pacific thread herring*/pinchagua (Opisthonema spp.)*	Ecuador	Least concern	Not listed	High risk	Yes
Pacific chub mackerel*/macarela (Scomber japonicus)*	Ecuador	Least concern	Not listed	High risk	Yes
South Pacific hake *(Merluccius gayi)*	Ecuador	Data deficient	Not listed	High risk	Yes
Bullet tuna *(Auxis rochei)*	Ecuador	Least concern	Not listed	High risk	Yes

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Step 3 Assessment Outcomes

By-product species name	Flag country(ies)	Fishing Area(s)	Stock name	Category C Assessment Outcome	Traceability information	Step 3 Risk Outcome
Yellowfin tuna *(Thunnus albacares)*	Ecuador	FAO 77 and 87	Eastern Central Pacific	Pass	Path 2 - Yes	Risk downgraded to Medium Risk
Skipjack tuna *(Katsuwonus pelamis)*	Ecuador	FAO 77 and 87	Eastern Central Pacific	Pass	Path 2 - Yes	Risk downgraded to Medium Risk
Pacific thread herring*/pinchagua (Opisthonema spp.)*	Ecuador	FAO 87	Ecuadorian Pacific Thread herring	Pass	Path 2 - Yes	Risk downgraded to Medium Risk
Pacific chub mackerel*/macarela (Scomber japonicus)*	Ecuador	FAO 87	Ecuadorian Pacific chub mackerel	Pass	Path 2 - Yes	Risk downgraded to Medium Risk
South Pacific hake *(Merluccius gayi)*	Ecuador	FAO 87	Ecuadorian South Pacific hake	Pass	Path 2 - Yes	Risk downgraded to Medium Risk
Bullet tuna *(Auxis rochei)*	Ecuador	FAO 87	Ecuadorian Bullet tuna	Pass	Path 2 - Yes	Risk downgraded to Medium Risk
Comments on Step 3 Assessment: N/A						

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Appendix 2 – detailed assessment outcomes

(step 2 and step 3 if applicable)

Step 2 outcomes

Flag state	Risk rating	Flag score	Port score	General score	Flag State is contracting party or cooperating non-contracting party to all relevant RFMOs	'Carded' under EU Carding system	Flag state party to PSMA	Flag state mandatory vessel tracking for commercial seagoing fleet	WGI Governance rank
Ecuador	High	2.58	2.11	2.43	1	3	1	1	35.38%

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Step 3 outcomes

Category C assessment

Species name		**Yellowfin tuna (*Thunnus albacares*)**	
Fishing area and stock		**FAO 77 and 87 (Eastern Central Pacific)**	
C1	**Category C Stock Status - Minimum Requirements**		
	C1.1	Fishery removals of the species in the fishery under assessment are included in the stock assessment process, OR are considered by scientific authorities to be negligible.	**PASS**
	C1.2	The species is considered, in its most recent stock assessment, to have a biomass above the limit reference point (or proxy), OR removals by the fishery under assessment are considered by scientific authorities to be negligible.	**PASS**
		Clause outcome:	**PASS**

A review for the yellowfin tuna was made in October 2026 for the Marintrust BP091 report and the Category C assessment for the **Eastern Pacific Ocean yellowfin tuna** has not changed because a new stock assessment is not yet available. Therefore, the assessment for this species utilizes previous outcomes and rationale.

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.

The Eastern Pacific Ocean (EPO) yellowfin tuna stock is managed and assessed by the Inter-American Tropical Tunas Commission (IATTC). The Eastern Pacific Ocean (EPO) yellowfin tuna stock is managed and assessed by the Inter-American Tropical Tunas Commission (IATTC). The 2025 benchmark assessment of yellowfin tuna in the eastern Pacific Ocean continues to use a risk analysis approach to provide management advice [2]. SSIs are considered to be important alternatives to formal stock assessments, particularly where those stock assessments may be too unreliable to form the basis for management advice [1]. Fishery removals (Table 1) are a key component of the modelling used to generate SSI's, and their development and use is evidence that managers have sought out alternative mechanisms where stock assessment uncertainty is high (**Error! Reference source not found.**)[2]. The most recent stock assessment was conducted in 2025.

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Table 1. Table 1. Total annual catches (t) of yellowfin, skipjack, and bigeye tunas, by all types of gear combined, in the Pacific Ocean. The EPO totals for 1995-2025 include discards from purse-seine vessels with carrying capacities greater than 363 t [2].

	YFT			SKJ			BET			Total		
	EPO	WCPO	Total	EPO	WCPO	Total	EPO	WCPO	Total	EPO	WCPO	Total
1996	266,928	425,669	692,597	132,335	999,701	1,132,036	114,706	107,168	221,874	513,969	1,532,538	2,046,507
1997	277,575	481,019	758,594	188,285	939,497	1,127,782	122,274	133,495	255,769	588,134	1,554,011	2,142,145
1998	280,606	536,845	817,451	165,489	1,244,132	1,409,621	93,954	152,415	246,369	540,049	1,933,392	2,473,441
1999	304,638	474,648	779,286	291,249	1,070,280	1,361,529	93,078	162,524	255,602	688,965	1,707,452	2,396,417
2000	286,863	506,028	792,891	230,479	1,194,139	1,424,618	148,557	148,094	296,651	665,899	1,848,261	2,514,160
2001	425,008	504,501	929,509	157,676	1,100,714	1,258,390	130,546	134,459	265,005	713,230	1,739,674	2,452,904
2002	443,458	489,995	933,453	167,048	1,253,634	1,420,682	132,806	157,958	290,764	743,312	1,901,587	2,644,899
2003	415,933	563,926	979,859	300,470	1,245,155	1,545,625	115,175	143,471	258,646	831,578	1,952,552	2,784,130
2004	296,847	595,888	892,735	217,249	1,354,765	1,572,014	110,722	182,599	293,321	624,818	2,133,252	2,758,070
2005	286,492	551,822	838,314	283,453	1,418,105	1,701,558	110,514	154,748	265,262	680,459	2,124,675	2,805,134
2006	180,519	537,076	717,595	309,090	1,479,366	1,788,456	117,328	165,386	282,714	606,937	2,181,828	2,788,765
2007	182,141	565,930	748,071	216,324	1,663,353	1,879,677	94,260	165,365	259,625	492,725	2,394,648	2,887,373
2008	197,328	644,365	841,693	307,699	1,649,067	1,956,766	103,350	171,317	274,667	608,377	2,464,749	3,073,126
2009	250,413	558,914	809,327	239,408	1,761,272	2,000,680	109,255	169,294	278,549	599,076	2,489,480	3,088,556
2010	261,871	564,607	826,478	153,092	1,680,215	1,833,307	95,408	139,796	235,204	510,371	2,384,618	2,894,989
2011	216,720	530,946	747,666	283,509	1,536,806	1,820,315	89,460	168,119	257,579	589,689	2,235,871	2,825,560
2012	213,310	625,697	839,007	273,519	1,731,944	2,005,463	102,687	167,245	269,932	589,516	2,524,886	3,114,402
2013	231,170	578,467	809,637	284,043	1,831,413	2,115,456	86,029	154,783	240,812	601,242	2,564,663	3,165,905
2014	246,784	618,262	865,046	265,490	1,985,110	2,250,600	96,054	169,046	265,100	608,328	2,772,418	3,380,746
2015	260,265	589,128	849,393	334,049	1,788,545	2,122,594	104,820	145,709	250,529	699,134	2,523,382	3,222,516
2016	255,465	658,112	913,577	345,163	1,791,373	2,136,536	92,952	156,495	249,447	693,580	2,605,980	3,299,560
2017	224,800	704,628	929,428	327,629	1,615,560	1,943,189	102,860	130,533	233,393	655,289	2,450,721	3,106,010
2018	253,305	695,759	949,064	291,352	1,843,397	2,134,749	94,479	153,017	247,496	639,136	2,692,173	3,331,309
2019	242,248	682,704	924,952	350,992	2,044,247	2,395,239	97,145	131,124	228,269	690,385	2,858,075	3,548,460
2020	231,693	736,547	968,240	298,583	1,714,513	2,013,096	105,183	139,923	245,106	635,459	2,590,983	3,226,442
2021	263,842	755,978	1,019,820	328,616	1,714,670	2,043,286	80,177	140,586	220,763	672,635	2,611,234	3,283,869
2022	298,862	660,975	959,837	298,136	1,750,324	2,048,460	68,265	146,065	214,330	665,263	2,557,364	3,222,627
2023	306,108	746,359	1,052,467	390,554	1,668,328	2,058,882	67,240	143,704	210,944	763,902	2,558,391	3,322,293
2024	308,200	716,282	1,024,482	646,643	2,051,550	2,698,193	55,415	141,338	196,753	1,010,258	2,909,170	3,919,428
2025	445,756	*	445,756	471,708	*	471,708	63,753	*	63,753	981,217	*	981,217

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

The 2025 benchmark assessment indicates that yellowfin tuna in the eastern Pacific Ocean is in a healthy condition relative to management reference points. As shown in the Kobe plot (Figure 1) all spatial structure hypotheses place the stock in the green quadrant, indicating spawning biomass above the MSY reference level and fishing mortality below FMSY. The assessment estimated a very low probability that biomass is below the target reference points or that fishing mortality exceeds sustainable levels, and a zero probability of breaching the adopted limit reference points. Overall, the assessment concludes that the stock is not overfished and is not subject to overfishing.

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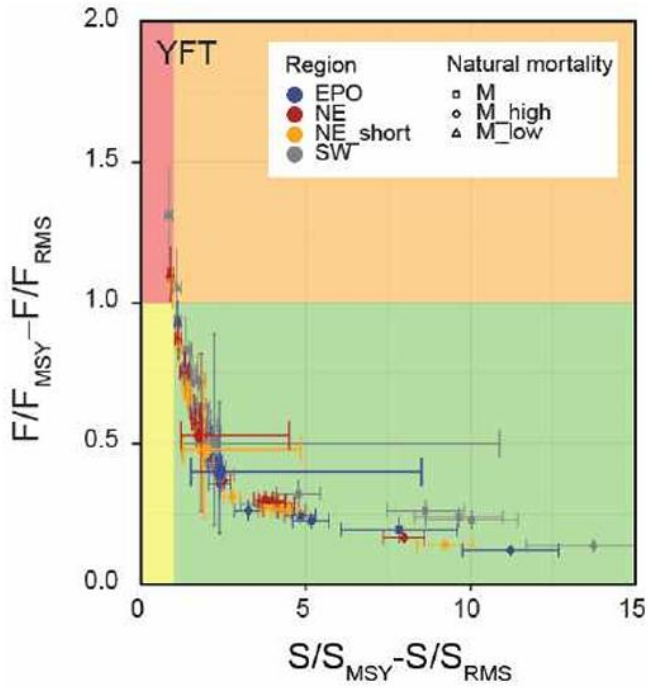


Figure 1. Kobe plot for yellowfin tuna in the EPO of estimates of spawning stock size (S) and fishing mortality (F). [1].

References

[1] IATTC (2025). Stock assessment of yellowfin tuna in the eastern Pacific Ocean: 2025 benchmark assessment. SAC-16-03_Evaluacion-de-referencia-del-aleta-amarilla-Texto-principal-ES.pdf

[2] IATCC (2026). The tuna fishery in the Eastern Pacific Ocean in 2025. https://www.iattc.org/GetAttachment/8c01144d-131a-4231-b129-4680fca45632/SAC-17-01_La-pesqueria-atunera-en-el-OPO-en-2025-ES.pdf

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Species name		Skipjack tuna (*Katsuwonus pelamis*)	
Fishing area and stock		FAO 77 and 87 (Eastern Central Pacific)	
C1	**Category C Stock Status - Minimum Requirements**		
	C1.1	Fishery removals of the species in the fishery under assessment are included in the stock assessment process, OR are considered by scientific authorities to be negligible.	**PASS**
	C1.2	The species is considered, in its most recent stock assessment, to have a biomass above the limit reference point (or proxy), OR removals by the fishery under assessment are considered by scientific authorities to be negligible.	**PASS**
		Clause outcome:	**PASS**

A review for the skipjack tuna was made in October 2026 for the Marintrust BP091 report and the Category C assessment for the **Eastern Pacific Ocean skipjack tuna** has not changed because a new stock assessment is not yet available. Therefore, the assessment for this species utilizes previous outcomes and rationale.

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.

One stock of skipjack is defined in the eastern Pacific Ocean (EPO). Catch data is available (Table 1) and it is used by the IATTC to assess the stock status of skipjack tuna in the EPO. In 2024, a benchmark stock assessment was conducted using an integrated statistical age-structured catch-at-length model in Stock Synthesis [2]. Several data sources were used to fit the model, including data from sixteen defined fisheries and five “surveys”. The fisheries are classified by gear type (purse-seine, longline) and purse-seine set [1]. The "surveys” data included: a) catch-per-set indices for purse-seine sets, by set type (OBJ, NOA), where the relationship between catch-per-set and abundance remains uncertain; b) an index based on recently developed echosounder buoy data; c) absolute biomass from a spatiotemporal Petersen-type model applied to tag-recapture data; and d) an index of relative biomass from a tagging biomass model that uses a flexible effort assumption. A reference model was developed based on the most plausible assumptions and sensitivity analyses were conducted by changing the assumptions of the reference model [1].

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

According to the reference model, current fishing mortality remains below the threshold associated with the MSY proxy, while the spawning biomass exceeds the dynamic level linked to the same benchmark (Figure 2). Furthermore, there is less than a 10% chance that the spawning biomass surpasses the established limit reference point [1][3]. This conclusion holds true across all sensitivity models as well.

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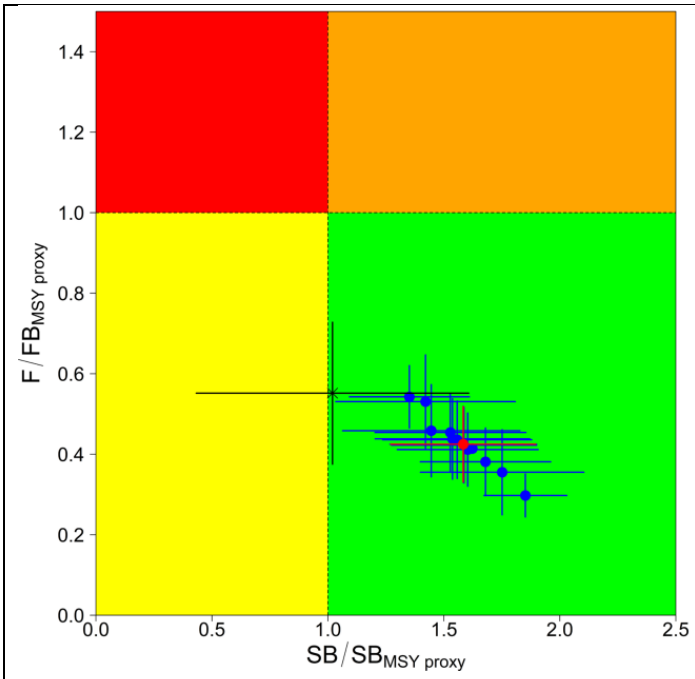


*Figure 2. Kobe plot showing the most recent stock status estimates from all the models for skipjack tuna. The x-axis is SBcurrent/0.3*dynamic SB0. Each dot is based on the average F over the most recent three years, 2021-2023, and the error bars represent the 80% confidence intervals of model estimates. The red dot and error bars represent the estimates from the reference model. The black cross and error bars represent the estimates from the model that removed the ECHO index [1].*

References

[1] IATTC. 2024a. DOCUMENT SAC-15-04 REV STOCK ASSESSMENT OF SKIPJACK TUNA IN THE EASTERN PACIFIC OCEAN: 2024 BENCHMARK ASSESSMENT. https://www.iattc.org/GetAttachment/f57dece1-81ba-4771-8fa8-3362320a368a/SAC-15-04_Skipjack-tuna-benchmark-assessment-2024.pdf

[2] IATTC (2026). The tuna fishery in the Eastern Pacific Ocean in 2025. https://www.iattc.org/GetAttachment/8c01144d-131a-4231-b129-4680fca45632/SAC-17-01_La-pesqueria-atunera-en-el-OPO-en-2025-ES.pdf

[3] IATTC (2025). DOCUMENT SAC-16-04. RISK ASSESSMENT OF SKIPJACK TUNA IN THE EASTERN PACIFIC OCEAN. https://www.iattc.org/GetAttachment/f42e4520-24b6-4577-a617-389d952d962c/SAC-16-04_SKJ-risk-assessment.pdf

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Species name		Pacific thread herring/*pinchagua* (*Opisthonema* spp.)	
Fishing area and stock		FAO 87 - Ecuadorian Pacific Thread herring	
C1	**Category C Stock Status - Minimum Requirements**		
	C1.1	Fishery removals of the species in the fishery under assessment are included in the stock assessment process, OR are considered by scientific authorities to be negligible.	**PASS**
	C1.2	The species is considered, in its most recent stock assessment, to have a biomass above the limit reference point (or proxy), OR removals by the fishery under assessment are considered by scientific authorities to be negligible.	**PASS**
		Clause outcome:	**PASS**

A review for the **Pacific thread herring** was made in October 2026 for the Marintrust BP133 report and the Category C assessment for the **Ecuadorian Pacific thread herring** has not changed because a new stock assessment is not yet available. Therefore, the assessment for this species utilizes previous outcomes and rationale.

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.

Removals of *Opisthonema spp.* (Table 2) are incorporated into the stock assessment process through the use of commercial catch and landing information (Figure 3) collected from the Ecuadorian small pelagic fishery [2]. The assessment integrates fishery-dependent data, including historical catches and fishing effort information, together with biological and population parameters to estimate stock status and fishing mortality relative to management reference points.

The 2024 IPIAP assessment explicitly evaluates fishing mortality and stock dynamics using the recorded removals from the fishery, demonstrating that catches are accounted for within the analytical framework used to assess the stock [1]. The resulting estimates of fishing mortality, biomass, biomass-per-recruit

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and spawning potential are derived from a model parameterized with fishery removal data and associated monitoring information.

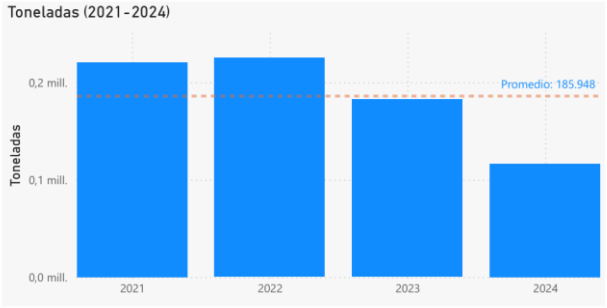
Table 2. Small pelagic landings in Ecuador in tons (2021-2024)[2].

Flota cerquera costera

Desembarques de pelágicos pequeños

Toneladas (2021-2024)

ESPECIES	2021	2022	2023	2024
MACARELA	164.707	158.121	54.931	29.496
BOTELLA	30.972	40.133	40.108	76.188
PICUDILLO	15.587	12.348	52.403	9.558
PINCHAGUA	7.127	22.064	7.742	32.657
ANCHOVETA	13	55	24.126	
CHUHUECO	6.184	9.250	8.210	294
SARDINA REDONDA	2.679	4.906	1.192	359
ROLLIZO	164	66	1.332	119
SARDINA DEL SUR		119		
JUREL	1	27	6	84
ANCHOA	3	5	49	0
Total	**227.436**	**247.096**	**190.098**	**148.753**



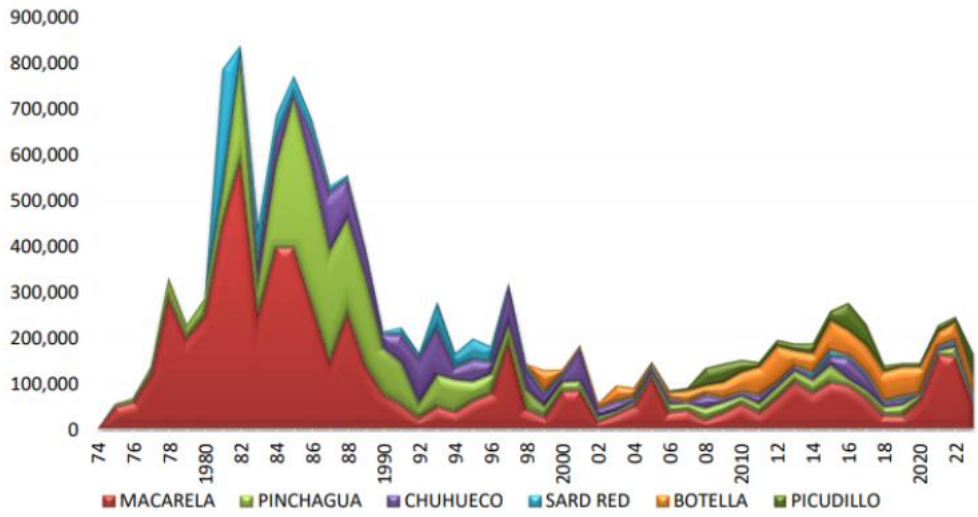


Figure 3. Landings of the main small pelagic species in Ecuador, 1975–2023. Pacific chub mackerel (Scomber japonicus) is shown in red ("Macarela"), Pacific thread herring (Opisthonema spp.) in light green ("Pinchagua"), frigate tuna (Auxis spp.) in orange ("Botella")[1].

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

The most recent stock assessment for *Opisthonema spp.* indicates that the stock remains above the limit reference point (or proxy). The 2024 IPIAP assessment estimated stock biomass at approximately 86,000 t, equivalent to 49% of the unfished biomass (B_0) and above the biomass target reference point (BMSY = 70,000 t, corresponding to 40% of B_0). The assessment concluded that the probability of biomass being below BMSY is negligible and, consequently, the probability of biomass being below the limit reference point is also negligible [1].

These results are consistent with the Kobe plot, which shows the stock remaining outside the overfished and overfishing zones in recent years, with biomass above BMSY and fishing mortality at sustainable

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levels (Figure 4). Although the stock experienced periods of elevated fishing mortality during the late 1970s and 1980s, the stock status improved substantially thereafter and has remained predominantly within the sustainable management area in recent decades.

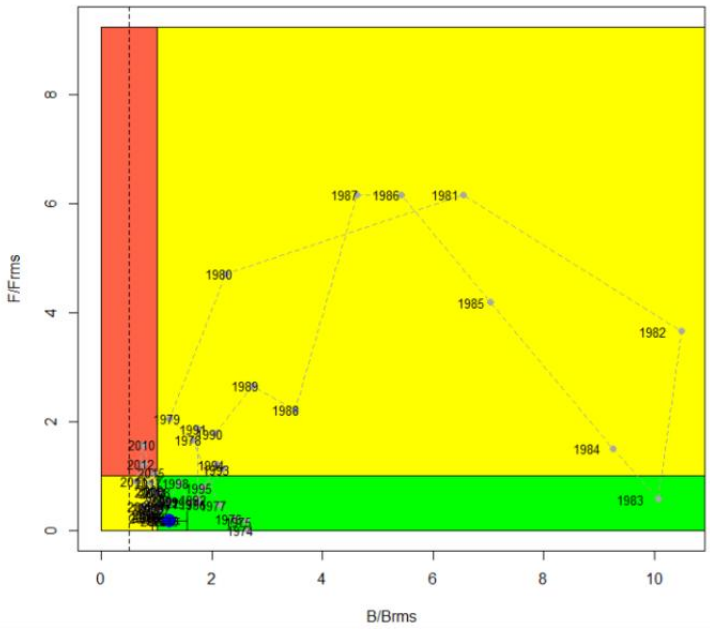


Figure 4. Kobe diagram for the stock (B/BMSY -= 1.23 (Risk_SE = 0.08); F/FMSY = 0.18 (Risk_SP = 0) [1].

References

[1] Canales C. M. and Jurado, V. 2024. Evaluation of Ecuador's Small Pelagic Resource Stock 2023: https://institutopesca.gob.ec/wp-content/uploads/2024/07/Informe_Evaluacion_2024.pdf

[2] IPIAP. 2025. Desembarques de pelágicos pequeños Toneladas (2021-2024). https://institutopesca.gob.ec/wp-content/uploads/2025/05/Panel-desembarques-FLOTA-CERQUERA-2021-2024.pdf

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Species name	Pacific chub mackerel/*macarela* (*Scomber japonicus*)	
Fishing area and stock	FAO 87 - Ecuadorian Pacific chub mackerel	
C1	**Category C Stock Status - Minimum Requirements**	
C1.1	Fishery removals of the species in the fishery under assessment are included in the stock assessment process, OR are considered by scientific authorities to be negligible.	**PASS**
C1.2	The species is considered, in its most recent stock assessment, to have a biomass above the limit reference point (or proxy), OR removals by the fishery under assessment are considered by scientific authorities to be negligible.	**PASS**
	Clause outcome:	**PASS**

A review for the **Pacific chub mackerel** was made in October 2026 for the MarinTrust BP133 report and the Category C assessment for the **Ecuadorian Pacific chub mackerel** has not changed because a new stock assessment is not yet available. Therefore, the assessment for this species utilizes previous outcomes and rationale.

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.

Removals of *Scomber japonicus* are fully incorporated into the stock assessment process through the integration of commercial landing data, fishery-dependent CPUE information, biological sampling, and fishery-independent acoustic survey data collected by *Instituto Publico de Investigación de Agricultura y Pesca* (IPIAP) [1]. Landings from the small pelagic purse-seine fleet are routinely recorded through official monitoring programmes and constitute a key input to annual stock assessments and management advice [1][2].

The 2024 stock assessment uses these fishery removals (Figure 3) together with abundance, size composition, and acoustic biomass indices to estimate stock status and biological reference points, including biomass and fishing mortality relative to MSY-based targets [1]. The resulting outputs are subsequently used to inform the multispecies harvest strategy and annual management measures applied to the fishery.

Therefore, fishery removals of *S. japonicus* are explicitly accounted for within the stock assessment process and are used directly in evaluating stock status and determining management responses. As such, the requirements of this clause are met [1].

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

The 2024 IPIAP assessment estimated stock biomass at approximately 352,000 t, equivalent to 38% of unfished biomass (B_0), slightly below the target reference point of BMSY = 374,000 t (40% B_0). Although the assessment estimated a 61% probability that biomass is below BMSY, it also concluded that there is a low probability that biomass is below the limit reference point, indicating that the stock remains above the level at which serious conservation concerns would arise (Figure 5)[1].

As a result, while biomass is estimated to be marginally below the target reference point, the stock is not considered depleted and remains above the limit reference point used to safeguard stock productivity. The

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assessment therefore indicates that *S. japonicus* continues to be managed within biologically sustainable limits under Ecuador's small pelagic management framework [1].

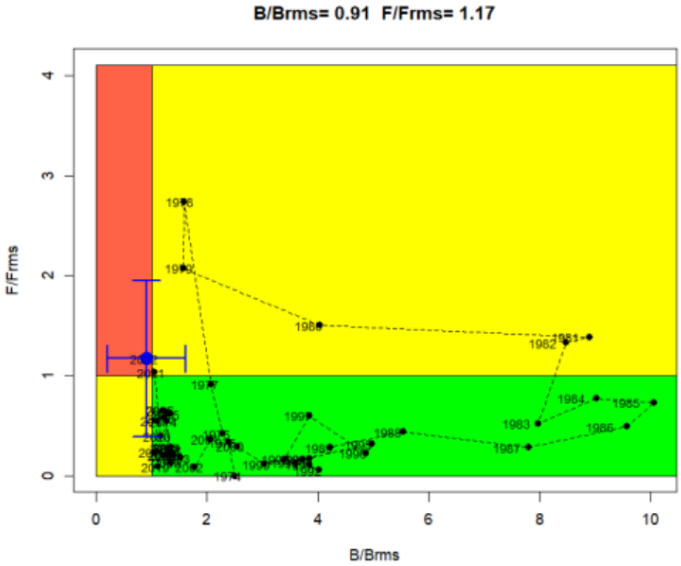


Figure 5. Kobe plot for Pacific chub mackerel in the Ecuadorian small pelagic fishery. Blue dot is the current estimated status (Canales & Jurado 2024).

References

[1] Canales C. M. and Jurado, V. 2024. Evaluation of Ecuador's Small Pelagic Resource Stock 2023: https://institutopesca.gob.ec/wp-content/uploads/2024/07/Informe_Evaluacion_2024.pdf

[2] IPIAP. 2025. Desembarques de pelágicos pequeños Toneladas (2021-2024). https://institutopesca.gob.ec/wp-content/uploads/2025/05/Panel-desembarques-FLOTA-CERQUERA-2021-2024.pdf

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Species name	South Pacific hake (*Merluccius gayi*)	
Fishing area and stock	FAO 87 - Ecuadorian South Pacific hake	
C1	**Category C Stock Status - Minimum Requirements**	
C1.1	Fishery removals of the species in the fishery under assessment are included in the stock assessment process, OR are considered by scientific authorities to be negligible.	**PASS**
C1.2	The species is considered, in its most recent stock assessment, to have a biomass above the limit reference point (or proxy), OR removals by the fishery under assessment are considered by scientific authorities to be negligible.	**PASS**
	Clause outcome:	**PASS**

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

As it was presented in previous audit a single South Pacific hake stock is considered to extend through Ecuadorian and Peruvian waters. Regular stock assessments are conducted by the Peruvian Instituto del Mar del Perú (IMARPE). The most recent assessment was conducted in 2025, and incorporated catch data from the Ecuadorian fishery as the Peruvian fishery (Figure 6). Although Ecuador has a regulated fishery, a continuous and reliable time series of landings for the stock is not available. Therefore, for assessment purposes, landing proxies were estimated based on hake exports adding the information from reports published by the Public Institute for Aquaculture and Fisheries Research of Ecuador (IPIAP), available on its institutional website (https://institutopesca.gob.ec/merluza/) [1].

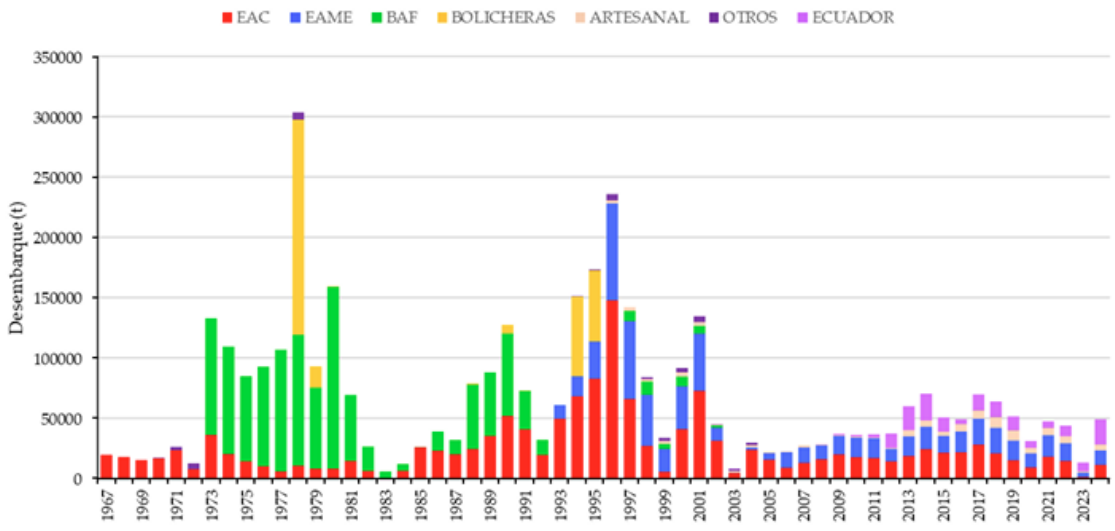


Figure 6. Hake landings by fleet type, 1971-2024 [1]

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

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The current biomass estimates produced by the two model calibrations were 158,148 t and 219,852 t (Figure 7), respectively. Although the most recent survey indicated lower stock densities and a more dispersed distribution pattern, these observations were considered strongly influenced by oceanographic conditions and were therefore not incorporated into the stock assessment model. The model was updated using the abundance indices applied in the 2024 assessment [2], together with available catch information from the Peruvian and Ecuadorian fleets.

The report states that according to the assessment model results, although *Merluccius gayi peruanus* shows a reduction in available biomass within the Peruvian Maritime Domain, the stock remains above the biological reference points [1].

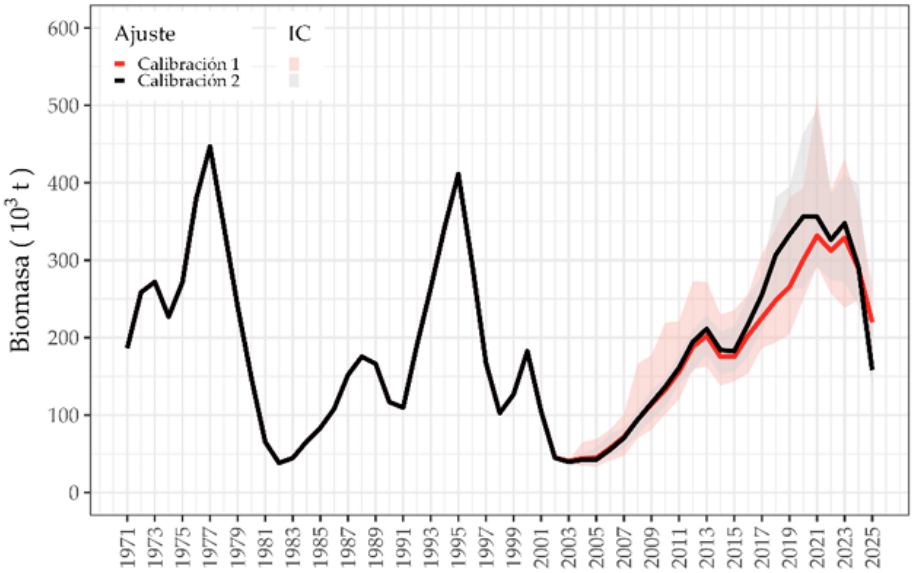


Figure 7. Estimated hake biomass under two calibration approaches (IMARPE 2024).

References

[1] IMARPE (2025). Análisis De La Pesquería, Estado Poblacional Y Proyecciones De Pesca De La Merluza Peruana, Julio 2025 – Julio 2026 (Analysis Of The Fishery, Population Status, And Projections For The Peruvian Hake Fisheries, July 2025 – July 2026). https://www.imarpe.gob.pe/wp-content/uploads/2026/01/Analisis-de-la-Pesqueria-Estado-Poblacional-y-Proyecciones-de-Pesca-de-la-Merluza-Peruana-Merluccius-Gayi-Peruanus.pdf

[2] IMARPE (2024). Análisis De La Pesquería, Estado Poblacional Y Proyecciones De Pesca De La Merluza Peruana, Julio 2024 – Julio 2025 (Analysis Of The Fishery, Population Status, And Projections For The Peruvian Hake Fisheries, July 2024 – July 2025). https://www.imarpe.gob.pe/wp-content/uploads/2025/09/20240704_1200-Monitoreo_de_indicadores_biologicos_y_pesqueros_de_la_merluza_peruana_mayo_2024-Informe_correspondiente_al_oficio_n%C2%B0_-0561_2024_IMARPE_PCD-1.pdf

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Species name	Bullet tuna/*Botella* (*Auxis rochei*)	
Fishing area and stock	FAO 87 - Ecuadorian Bullet tuna	
C1	**Category C Stock Status - Minimum Requirements**	
C1.1	Fishery removals of the species in the fishery under assessment are included in the stock assessment process, OR are considered by scientific authorities to be negligible.	**PASS**
C1.2	The species is considered, in its most recent stock assessment, to have a biomass above the limit reference point (or proxy), OR removals by the fishery under assessment are considered by scientific authorities to be negligible.	**PASS**
	Clause outcome:	**PASS**

A review for the ***Auxis* spp.** was made in October 2026 for the Marintrust BP133 report and the Category C assessment for the **Ecuadorian *Auxis* spp.** has not changed because a new stock assessment is not yet available. Therefore, the assessment for this species utilizes previous outcomes and rationale.

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.

Removals of *Auxis* spp. are fully incorporated into the stock assessment process through the integration of commercial landing data (Figure 3), fishery-dependent CPUE information, biological sampling, and fishery-independent acoustic survey data collected by the *Instituto Público de Investigación de Acuicultura y Pesca* (IPIAP) [1]. Landings from the small pelagic purse-seine fleet are routinely recorded through official monitoring programmes and constitute a key input to annual stock assessments and management advice [1] (Table 2).

The 2024 stock assessment uses these fishery removals together with abundance indices, size-composition data, and acoustic biomass estimates to evaluate stock status and estimate biological reference points, including biomass and fishing mortality relative to MSY-based targets [1]. The resulting outputs are subsequently used to inform the multispecies harvest strategy and annual management measures applied to the fishery.

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

The stock assessment is conducted at the genus level (*Auxis spp.)* and therefore encompasses *Auxis thazard*. This assessment indicates that the stock remains above the limit reference point (or proxy). The 2024 assessment estimated B/BMSY = 1.07 and F/FMSY = 0.90 for the most recent assessment year, indicating that biomass is above the target reference point and fishing mortality is below the level associated with maximum sustainable yield. Kobe plot (Figure 8) *Auxis spp*. is neither overfished nor subject to overfishing. Although the historical time series shows occasional exceedances of FMSY, the most recent assessment year meets the target-based criterion, confirming an improvement in stock status and exploitation levels over time.

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For more information, the February 2025 hydroacoustic survey estimated *Auxis* spp. biomass at 56,343 t, representing approximately 24.9% of total small pelagic biomass, confirming that the species remains an important and abundant component of the small pelagic assemblage [3].

Taken together, the stock assessment results and fishery-independent survey data indicate that *Auxis spp.* biomass remains above the limit reference point and that the stock is being exploited at sustainable levels.

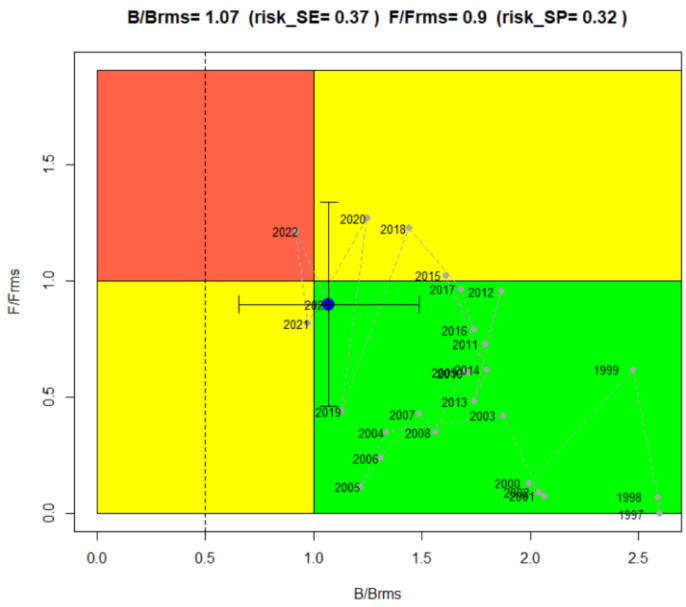


Figure 8. Kobe chart for bullet tuna in Ecuadorian waters. The blue dot is the most recent estimate of stock status (Canales and Jurado, 2024).

References

[1] Canales C. M. and Jurado, V. 2024. Evaluation of Ecuador's Small Pelagic Resource Stock 2023: https://institutopesca.gob.ec/wp-content/uploads/2024/07/Informe_Evaluacion_2024.pdf

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[3] Instituto Público de Investigación de Acuicultura y Pesca (IPIAP). (2025). Informe del Crucero Hidroacústico 2025-02-01 PPP. Evaluación de biomasa y distribución de peces pelágicos pequeños. Guayaquil, Ecuador, February 2025. https://institutopesca.gob.ec/cruceros-de-hidroacustica/

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Traceability information

Information provided for Step 3 Path 1 or Path 2

Species name		Skipjack tuna (*Katsuwonus pelamis*)		
Path 1		Yes ☐ No ☒		
Confirm all KDEs are provided		Yes ☐ No ☐		
Path 2		Yes ☒ No ☐		
Path 2 outcome	**Flag country**	**Coastal score**	**Port score**	**Risk outcome**
	Ecuador	2.63	2.11	Downgraded to medium risk

Species name		Yellowfin tuna (*Thunnus albacares*)		
Path 1		Yes ☐ No ☒		
Confirm all KDEs are provided		Yes ☐ No ☐		
Path 2		Yes ☒ No ☐		
Path 2 outcome	**Flag country**	**Coastal score**	**Port score**	**Risk outcome**
	Ecuador	2.63	2.11	Downgraded to medium risk

Species name		Pacific thread herring/pinchagua (*Opisthonema spp.)*		
Path 1		Yes ☐ No ☒		
Confirm all KDEs are provided		Yes ☐ No ☐		
Path 2		Yes ☒ No ☐		
Path 2 outcome	**Flag country**	**Coastal score**	**Port score**	**Risk outcome**
	Ecuador	2.63	2.11	Downgraded to medium risk

Species name		Pacific chub mackerel/macarela (*Scomber japonicus*)		
Path 1		Yes ☐ No ☒		
Confirm all KDEs are provided		Yes ☐ No ☐		
Path 2		Yes ☒ No ☐		
Path 2 outcome	**Flag country**	**Coastal score**	**Port score**	**Risk outcome**
	Ecuador	2.63	2.11	Downgraded to medium risk

Species name		South Pacific hake (*Merluccius gayi*)		
Path 1		Yes ☐ No ☒		
Confirm all KDEs are provided		Yes ☐ No ☐		
Path 2		Yes ☒ No ☐		
Path 2 outcome	**Flag country**	**Coastal score**	**Port score**	**Risk outcome**
	Ecuador	2.63	2.11	Downgraded to medium risk

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Species name		Bullet tuna/botella (*Auxis rochei*)		
Path 1		Yes ☐ No ☒		
Confirm all KDEs are provided		Yes ☐ No ☐		
Path 2		Yes ☒ No ☐		
Path 2 outcome	**Flag country**	**Coastal score**	**Port score**	**Risk outcome**
	Ecuador	2.63	2.11	Downgraded to medium risk

Guidance for Applicants/Certificate holders on improved traceability

When by-product origin cannot be made more granular than major FAO Areas, or when the source fishery is taking place in the High Seas (i.e. outside of EEZs of all relevant nations), an assessor must evaluate the Coastal and Port scores for each nation that straddles that FAO Area. This may lead to higher risk outcomes for an applicant. To mitigate that risk, better practice involves securing KDEs from the source fishery of the by-products, thereby meeting Path 1 instead of Path 2.

What do better practices look like?
Comprehensive data collection and sharing: Collect detailed information using Key Data Elements (KDEs) including vessel identification and authorisation, species, catch areas, fishing method and dates. These are defined in the MarinTrust Standard clauses 2.11.2.2 and 3.2.5.

Supply chain transparency: Maintain detailed records at each step of the supply chain, from capture to final sale, to ensure traceability.

Interoperable systems and technologies to support the collection and transfer of this information.

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