



By-Product assessment report

BP120

Productos Pesqueros SA Pro

Report code	BP120	Date of issue	August 2026
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1. Application details			
Applicant		Productos Pesqueros SA Pro	
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		Susana Sainz-Trapaga	
CB internal peer reviewer name		Matthew Jew	
Internal peer review evaluation		Agree with evaluation	
Number of Assessment days		2	
Comments on the assessment		This re-approval covers 8 by-product species: Yellowfin tuna, Bigeye tuna, Skipjack tuna, Pacific thread herring, Pacific chub mackerel, Sardina redonda, South Pacific hake and Bullet tuna. These originate under the flag states of Ecuador, except for Yellowfin, Bigeye and Skipjack which also originate from Panama and Nicaragua. All species were considered High Risk at Step 2 and were subject to Step 3 Category C assessments & Traceability. They pass Step 3 Category C and through Path 2 Traceability have had their risk rating downgraded to achieve “Approved source with caution” status.	
3. Approval validity		Valid from 08/2026	Valid until 08/2027
4. Assessment cycle		Re-Approval	

5. By-product assessment outcomes			
By-product species name	Flag country(ies)	Fishing Area(s)	MarinTrust approval status
Yellowfin tuna (<i>Thunnus albacares</i>)	Ecuador, Panama, Nicaragua	FAO 77 & 87	Approved source with caution
Bigeye tuna (<i>Thunnus obesus</i>)	Ecuador, Panama, Nicaragua	FAO 77 & 87	Approved source with caution
Skipjack tuna (<i>Katsuwonus pelamis</i>)	Ecuador, Panama, Nicaragua	FAO 77 & 87	Approved source with caution
Pacific thread herring/pinchagua (<i>Opisthonema spp.</i>)	Ecuador	FAO 87	Approved source with caution
Pacific chub mackerel/macarela (<i>Scomber japonicus</i>)	Ecuador	FAO 87	Approved source with caution
Sardina redonda (<i>Etrumeus acuminatus</i>)	Ecuador	FAO 87	Approved source with caution
South Pacific hake (<i>Merluccius gayi</i>)	Ecuador	FAO 87	Approved source with caution
Bullet tuna (<i>Auxis rochei</i>)	Ecuador	FAO 87	Approved source with caution

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.

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 (<i>Thunnus albacares</i>)	Ecuador, Panama, Nicaragua	Least concern	Not listed	High risk	Yes
Bigeye tuna (<i>Thunnus obesus</i>)	Ecuador, Panama, Nicaragua	Vulnerable	Not listed	High risk	Yes
Skipjack tuna (<i>Katsuwonus pelamis</i>)	Ecuador, Panama, Nicaragua	Least concern	Not listed	High risk	Yes
Pacific thread herring/pinchagua (<i>Opisthonema spp.</i>)	Ecuador	Least concern	Not listed	High risk	Yes
Pacific chub mackerel/macarela (<i>Scomber japonicus</i>)	Ecuador	Least concern	Not listed	High risk	Yes
Sardina redonda (<i>Etrumeus acuminatus</i>)	Ecuador	Least concern	Not listed	High risk	Yes
South Pacific hake (<i>Merluccius gayi</i>)	Ecuador	Data deficient	Not listed	High risk	Yes
Bullet tuna (<i>Auxis rochei</i>)	Ecuador	Least concern	Not listed	High risk	Yes

Step 3 Assessment Outcomes

By-product species name	Flag country(ies)	Fishing Area	Stock name	Category C Assessment Outcome	Traceability information	Step 3 Risk Outcome
Yellowfin tuna (<i>Thunnus albacares</i>)	Ecuador Panama Nicaragua	FAO 77 & 87	Eastern Pacific Ocean stock	Pass	Path 2 - Yes	Risk downgraded to Medium Risk
Bigeye tuna (<i>Thunnus obesus</i>)	Ecuador Panama Nicaragua	FAO 77 & 87	Eastern Pacific Ocean stock	Pass	Path 2 - Yes	Risk downgraded to Medium Risk
Skipjack tuna (<i>Katsuwonus pelamis</i>)	Ecuador Panama Nicaragua	FAO 77 & 87	Eastern Pacific Ocean stock	Pass	Path 2 - Yes	Risk downgraded to Medium Risk
Pacific thread herring/pinchagua (<i>Opisthonema spp.</i>)	Ecuador	FAO 87	Ecuadorian Pacific thread herring	Pass	Path 2 - Yes	Risk downgraded to Medium Risk
Pacific chub mackerel/macarela (<i>Scomber japonicus</i>)	Ecuador	FAO 87	Ecuadorian Pacific chub mackerel	Pass	Path 2 - Yes	Risk downgraded to Medium Risk
Sardina redonda (<i>Etrumeus acuminatus</i>)	Ecuador	FAO 87	Ecuadorian Sardina redonda	Pass	Path 2 - Yes	Risk downgraded to Medium Risk
South Pacific hake (<i>Merluccius gayi</i>)	Ecuador	FAO 87	South Pacific hake, Peru-Ecuador stock	Pass	Path 2 - Yes	Risk downgraded to Medium Risk
Bullet tuna (<i>Auxis rochei</i>)	Ecuador	FAO 87	Ecuadorian <i>Auxis.spp</i> stock	Pass	Path 2 - Yes	Risk downgraded to Medium Risk
Comments on Step 3 Assessment: Three by-product species are caught from vessels of three different flag countries: Ecuador, Panama and Nicaragua. Five other by product species are caught by Ecuadorian vessels. However, all the raw material arrives at the port of Manta-Manabí, Ecuador.						

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%
Panama	High	3.75	1.67	1.93	3	3	1	1	55.19%
Nicaragua	High	2.08	1.44	2.4	1	1	1	1	18.40%

Step 3 outcomes

Category C assessment

Species name		Yellowfin tuna (<i>Thunnus albacares</i>)	
Fishing area and stock		FAO 87 (Southeast Pacific) - Eastern Pacific Ocean (EPO) stock.	
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.			
Assessment and management of yellowfin tuna (<i>Thunnus albacares</i>) in the Eastern Pacific Ocean (EPO) is under the competency of the Inter-American Tropical Tuna Commission (IATTC). The 2025 benchmark assessment of yellowfin tuna in the eastern Pacific Ocean covered the period from 1984 through to the start of 2024.			
Catch, length composition, and indices of relative abundance were the main data types used in the assessment. The purse-seine catch, CPUE and length composition of yellowfin tuna are estimated by the staff using several data sources including observer reports, logbooks, and port sampling. The longline catch, CPUE and length composition data are obtained by the CPCs and submitted annually to the IATTC.			
Total annual catches (t) of yellowfin, together with those of skipjack, and bigeye tunas, by all types of gear combined, in the Pacific Ocean from 1996 to 2025 are shown in Table 1.			

	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

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 1996-2025 include discards from purse-seine vessels with carrying capacities greater than 363 t. (IATTC SAC 17-01, 2026).

Fishery removals of the species in the fishery under assessment are included in the stock assessment process and therefore C1.1 is met.

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

The data used in the latest stock assessment suggests that there are either two or more stocks in the EPO or there is spatial structure in the population. Four spatial-structure hypotheses were considered: 1) EPO, 2) south and west region (SW), 3) northeast region (NE), and 4) NE-short, which is in the same area as NE, but the models start in 2006 instead of 1984, to address patterns in the data (Figure 1).

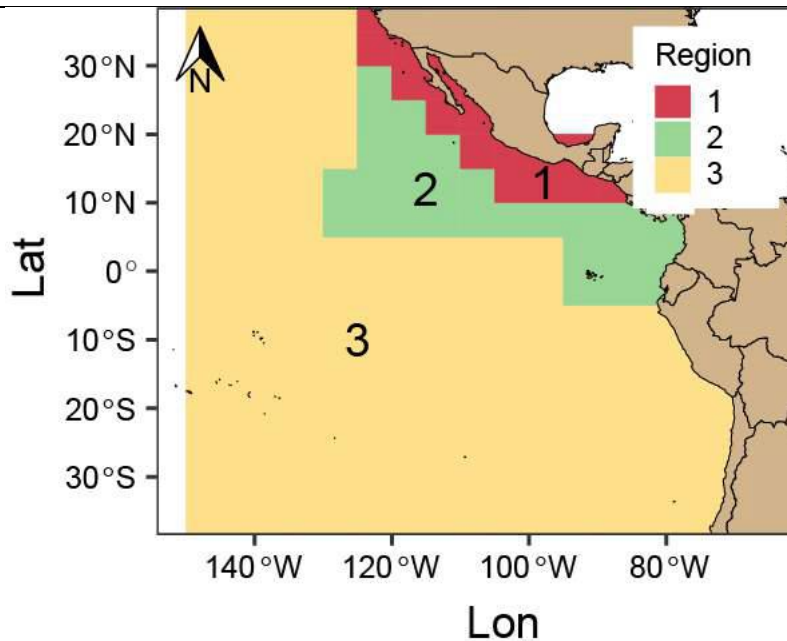


Figure 1. Regional divisions obtained using cluster analysis of length composition data from the purse seine fishery associated with dolphins. The EPO models consider all regions, the NE and NE_short models include regions 1 and 2, the SW model comprised only region 3. Further subdivisions in areas were made within each region based on the cluster analysis results, which were treated as different fisheries. **Source:** IATTC SAC-16-03, 2025.

The assessment results show the same stock status all four spatial-structure hypotheses with respect to the IATTC interim target and limit reference points (Table 2 and Figure 3). The stock(s) is estimated to be well above the spawning biomass correspond to MSY (S_{MSY}) and the staff proposed MSY proxy $S_{30\%}$ with low probability of being below these. The fishing mortality is estimated to be well below the level corresponding to MSY and the MSY proxy $F_{30\%}$ with low probability of being above these. The assessment estimates zero probability that the spawning biomass or fishing mortality limit reference points have been breached.

	EPO	NE	NE_short	SW
S_{MSY}/S_0^*	0.180	0.189	0.194	0.162
$S_{MSY_d}/S_0_d^*$	0.190	0.192	0.201	0.170
$F_{current}/F_{30\%S_0_d}$	0.559	0.718	0.643	0.757
$p(F_{current} > F_{30\%S_0_d})$	0.002	0.059	0.020	0.161
$F_{current}/F_{MSY}$	0.397	0.532	0.484	0.502
$p(F_{current} > F_{MSY})$	0.004	0.034	0.031	0.075
$F_{current}/F_{LIMIT}$	0.232	0.272	0.243	0.330
$p(F_{current} > F_{LIMIT})$	0.000	0.000	0.000	0.000
$S_{current}/30\%S_0_d$	1.73	1.35	1.49	1.46
$p(S_{current} < 30\%S_0_d)$	0.0000588	0.044	0.004	0.081
$S_{current}/S_{MSY_d}$	2.38	1.82	1.91	2.22
$p(S_{current} < S_{MSY_d})$	0.000	0.000	0.000	0.000
$S_{current}/S_{LIMIT}$	7.67	5.43	7.23	7.48
$p(S_{current} < S_{LIMIT})$	0.000	0.000	0.000	0.000

Table 2. Management quantities for yellowfin tuna in the EPO for each spatial structure hypothesis. The medians (or expected values *) and probabilities were obtained from the join probability distributions across models. **Source:** IATTC SAC-16-03, 2025.

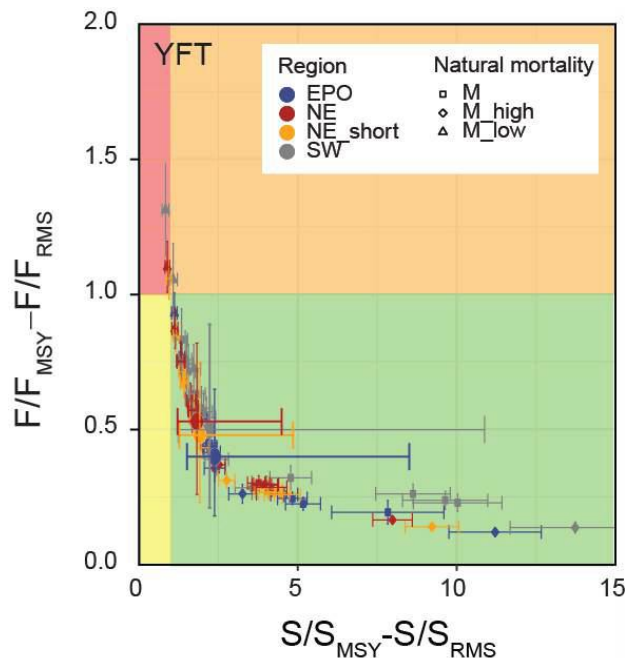


Figure 2. Kobe plot of the most recent estimates of spawning biomass (S) and fishing mortality (F) relative to their target reference points (S_{MSY_d} and F_{MSY}) for each hypothesis of spatial structure. Each dot is based on the average F over the most recent three years, 2021-2023, and the S for the first quarter of 2024 and the error bars represent the 80% confidence interval of model estimates. The larger dots represent the combined result for each spatial structure hypothesis. **Source:** IATTC SAC-16-03, 2025.

The species is considered, in its most recent stock assessment, to have a biomass above the limit reference point and therefore C1.2 is met.

References

IATTC SAC-17-01 (2026). The tuna fishery in the Eastern Pacific Ocean in 2025. 17th meeting of the IATTC Scientific Advisory Committee

<https://www.iattc.org/en-US/Event/DetailMeeting/Meeting-SAC-17>

IATTC SAC-16-03 (2025). Stock assessment of yellowfin tuna in the Eastern Pacific Ocean: 2025 benchmark assessment

<https://www.iattc.org/en-US/Event/DetailMeeting/Meeting-SAC-16>

Species name		Bigeye tuna (<i>Thunnus obesus</i>)	
Fishing area and stock		FAO 87 (Southeast Pacific) - Eastern Pacific Ocean (EPO) stock.	
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.			
Assessment and management of Bigeye tuna (<i>Thunnus obesus</i>) in the EPO is under the competency of the IATTC. The most recent benchmark assessment for bigeye tuna was conducted by the IATTC in 2024. In 2026 an update of the assessment was carried out for bigeye tuna in the EPO. Data updated for this assessment include new longline indices of relative abundance, longline and purse-seine catches, and purse-seine length compositions for 2024 and 2025, new longline length compositions for 2023 and 2024, and updated data for previous years were available, all of which were incorporated to estimate the current stock status. All model assumptions and parameters in this update assessment are set identically to those employed in the 2024 benchmark assessment. The 2026 update assessment identified twenty-two fishery fleets for bigeye tuna, classified by gear type (purse-seine or longline), purse-seine set type (floating-object (OBJ) or unassociated (NOA)), area of operation, and unit of longline catch (numbers or weight). Due to insufficient length composition data and a negligible contribution to total bigeye catch, both pole-and-line and dolphin-associated purse-seine catches are pooled into the NOA fisheries in this update assessment. The twenty-two fishery fleets comprise fourteen longline fishery fleets, five OBJ fishery fleets, one OBJ discard fleet, and two NOA fishery fleets. Total annual catches (t) of bigeye tuna, together with those of yellowfin tuna and skipjack, by all types of gear combined, in the Pacific Ocean from 1996 to 2025 are shown in Table 1 above. Fishery removals of the species in the fishery under assessment are included in the stock assessment process and therefore C1.1 is met.			
C1.2 The species is considered, in its most recent stock assessment, to have a biomass above the limit reference point (or proxy), OR removals by the fishery under assessment are considered by scientific authorities to be negligible.			
The overall results (joint probability distributions) of the risk analysis, summarized across the thirty-six reference models included in the update assessment, indicate the following: - 19.5% probability that the spawning biomass at the beginning of 2026 falls below the target reference point associated with the MSY (median $S_{current}/S_{MSY_dd}=1.43$).			

- 0.3% probability that the average fishing mortality in 2023-2025 exceeds the target reference point associated with the MSY (median $F/F_{MSY}=0.52$).
- 53.4% probability that the spawning biomass at the beginning of 2026 falls below the target reference point associated with 30% dynamic SBR (median $S/S_{30\%}=0.98$).
- 3.0% probability that the average fishing mortality in 2023-2025 exceeds the alternative target reference point associated with 30% dynamic SBR (median $F/F_{30\%}=0.70$).
- **0.0% probability that the spawning biomass at the beginning of 2026 falls below the limit reference point associated with 7.7% SBR (median $S/S_{limit}=3.45$).**
- 0.0% probability that the average fishing mortality in 2023-2025 exceeds the limit reference point associated with 7.7% SBR (median $F/F_{limit}=0.33$).

All models in level-1 hypothesis estimate that the average fishing mortality for 2023-2025 has dropped to a level significantly below F_{MSY} and that the spawning biomass at the beginning of 2026 has increased to a level above S_{MSY_dd} . These interpretations are, however, subject to considerable uncertainty, as indicated by the wide confidence intervals surrounding the most recent estimate in the phase plots (Figure 3).

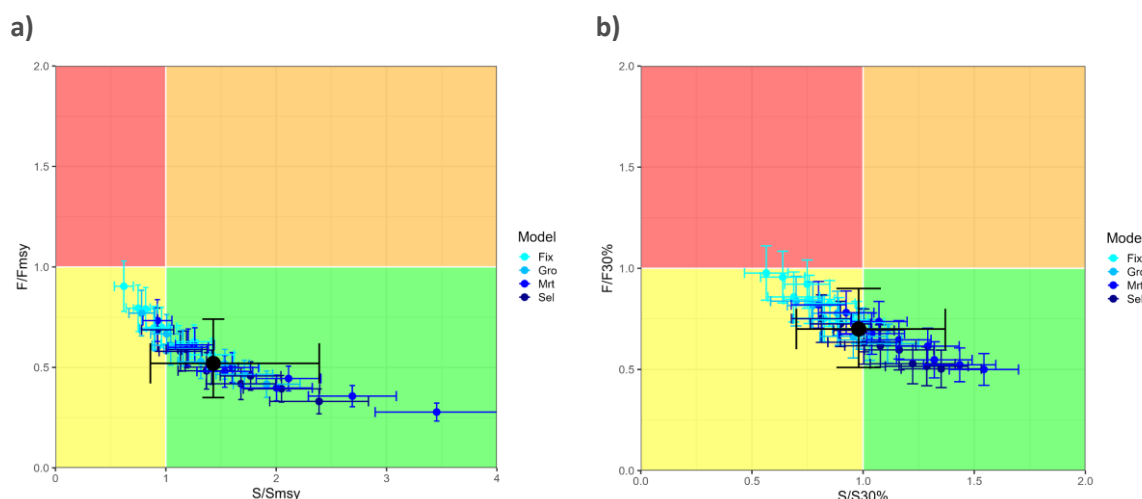


Figure 3. a) Phase (Kobe) plot of the most recent estimates of spawning biomass (S) and fishing mortality (F) relative to their MSY reference points (S_{MSY_d} and F_{MSY}) from the thirty-six reference models. Each color dot is based on S at the beginning of 2026 and average F over the most recent three years, 2023-2025, and its error bars represent the 80% confidence interval of model estimates. The large black circle and error bars represent the median and 80% confidence interval combined over all models, respectively. **b)** Phase plot of the most recent estimates of spawning biomass (S) and fishing mortality (F) relative to their 30% dynamic SBR reference points ($S_{30\%}$ and $F_{30\%}$) from the thirty-six reference models. Each color dot is based on S at the beginning of 2026 and average F over the most recent three years, 2023-2025, and its error bars represent the 80% confidence interval of model estimates. The large black circle and error bars represent the median and 80% confidence interval of combined over all models, respectively. **Source:** IATTC SAC-17-03, 2026.

The species is considered, in its most recent stock assessment, to have a biomass above the limit reference point and therefore C1.2 is met.

References

IATTC SAC-15-02 (2024) Bigeye tuna benchmark assessment 2024

<https://www.iattc.org/en-US/Event/DetailMeeting/Meeting-SAC-15>

IATTC SAC-17-01 (2026). The tuna fishery in the Eastern Pacific Ocean in 2025. 17th meeting of the IATTC Scientific Advisory Committee

<https://www.iattc.org/en-US/Event/DetailMeeting/Meeting-SAC-17>

IATTC SAC-17-03 (2026) Stock assessment of bigeye tuna in the Eastern Pacific Ocean: 2026 update assessment

<https://www.iattc.org/en-US/Event/DetailMeeting/Meeting-SAC-17>

Species name		Skipjack tuna (<i>Katsuwonus pelamis</i>)	
Fishing area and stock		FAO 87 (Southeast Pacific) - Eastern Pacific Ocean (EPO) stock.	
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.			
Assessment and management of Skipjack tuna (<i>Katsuwonus pelamis</i>) in the EPO is under the competency of the IATTC. The most recent benchmark assessment for skipjack tuna was conducted by the IATTC in 2024 and covered the period from 2006 to 2023. The assessment used an integrated statistical age-structured catch-at-length model in Stock Synthesis, which represented a significant update from the initial interim assessment conducted in 2022, with substantial advancements in the assessment methodologies. Sixteen fisheries are defined for the stock assessment of skipjack tuna in the EPO, classified by gear (purse-seine, longline), purse-seine set type, and geographical area of operation. The information used to estimate the total purse seine catch by species comes from canneries, on-board observers, vessel logbooks, and in-port sampling by IATTC staff. The observer and logbook databases also contain other information about the catches, such as the location, date, and set type. IATTC databases include data on the spatial and temporal distributions of longline catches of skipjack in the EPO by the fleets of distant-water CPCs (China, Chinese Taipei, French Polynesia, Japan, Korea, and Vanuatu) and EPO coastal CPCs (principally Mexico and the United States). Longline catches are reported in numbers by some fleets and in weight by others, and only a small pro-portion of skipjack catch was reported (only from observed vessels). The annual estimates of the longline catch are calculated by multiplying the number of hooks reported by the nominal CPUE, which is derived using observer data from four Members of the IATTC — China, Chinese Taipei, Japan, and Korea. If nominal quarterly CPUE data are not available, the quarterly-average CPUE in the same year is used instead. The pole-and-line catch of skipjack only makes up a few percent of the total catch over the assessment period and there has been little or none in recent years. Recreational catch is unknown and not included in the model. Two types of discards are considered, those resulting from inefficiencies in the fishing process and those related to the sorting of catches. Therefore, fisheries removals of the species in the fishery under assessment from reported catches are included in the stock assessment (data from 2006 to 2023 in Table 1 above), and complemented with estimations when necessary. C1.1 is met.			
C1.2 The species is considered, in its most recent stock assessment, to have a biomass above the limit reference point (or proxy), OR removals by the fishery under assessment are considered by scientific authorities to be negligible.			

The reference model estimates that the spawning biomass is currently above the target proxy of 30% of the unexploited spawning biomass under either the static (SBR) or the dynamic (dSBR) spawning biomass ratio (Figure 4). Only one of the sensitivity analyses, which removed the ECHO index, estimates that the stock is below the proxy target and only when based on the static definition. None of these scenarios estimate that the stock is below the limit reference point.

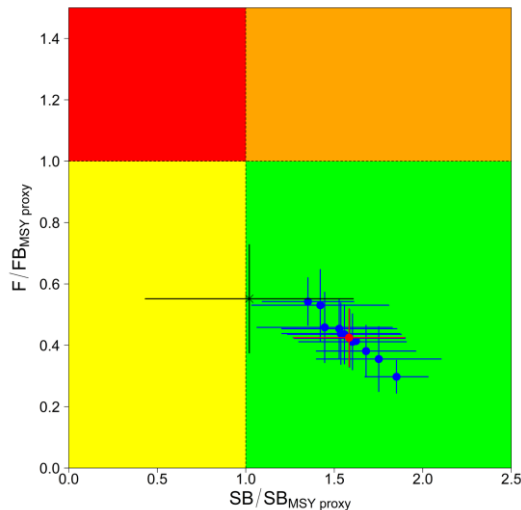


Figure 4. Kobe plot showing the most recent stock status estimates from all the models. The x-axis is $SB_{current}/0.3 \times \text{dynamic } SB_0$. Each dot is based on the average F over the most recent three years, 2021-2023, and the error bars represent the 80% confidence intervals of model estimates. 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. **Source:** IATTC-SAC-15-04, 2024.

The species is considered, in its most recent stock assessment, to have a biomass above the limit reference point and therefore C1.2 is met.

References

IATTC-SAC-15-04 (2024) Stock assessment of skipjack tuna in the Eastern Pacific Ocean: 2024 benchmark assessment

<https://www.iattc.org/en-US/Event/DetailMeeting/Meeting-SAC-15>

IATTC SAC-17-01 (2026). The tuna fishery in the Eastern Pacific Ocean in 2025. 17th meeting of the IATTC Scientific Advisory Committee

<https://www.iattc.org/en-US/Event/DetailMeeting/Meeting-SAC-17>

Species name		Pacific thread herring/pinchagua (<i>Opisthonema spp.</i>)
Fishing area and stock		FAO 87 - Ecuador
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.

The small pelagic fishery in Ecuador has substantial volumes of data and information available. In order to provide population estimates for assessment purposes, data series from biological sampling, size compositions, abundance indices, landings, acoustic surveys, and biological parameters of Ecuador's small pelagic resources were analyzed.

The landing data correspond to the period 1975–2023. For the 1980s, the data were obtained from the validation and recalculation process of catch data. From the 1990s through 2022, catches recorded in the factory landing database were used. These data were generated from the daily fishing reports submitted by the various processing companies, together with the monthly field sampling database. In addition, from 2016 onwards, information from the fishing database of the Observer Program for the purse-seine sardine fleet was incorporated.

Catches are assumed to have a very low level of error and to accurately represent the actual removals from the fishery. As a measure of uncertainty, a coefficient of variation of 5% is assigned to the catch data. Catches of Pacific thread herring/pinchagua (*Opisthonema spp.*) are shown in Table 3.

	ANCHOVETA	BOTELLA	CHUHUECO	JUREL	MACARELA	PICUDILLO	PINCHAGUA	SARDINA DEL SUR	SARDINA REDONDA	OTROS	TOTAL
2010	-	43489,0	6299,8	5201,4	57022,4	26688,7	15939,3	-	2400,3	62776,1	219817,1
2011	3544,1	60583,3	16595,3	75519,6	36628,5	11088,6	19725,9	-	2152,6	56598,5	282436,3
2012	13001,8	80373,4	6741,7	106,1	69411,2	13533,0	23472,9	-	2079,1	43034,3	251803,5
2013	2,1	33494,7	6862,2	3666,4	105618,5	16108,2	22375,2	-	2982,2	53453,4	244563,0
2014	-	41975,5	6802,5	9,1	79953,4	22569,6	27591,9	-	9248,0	30393,3	218543,4
2015	-	65006,7	18058,5	301,0	103602,2	21551,6	37865,5	1,5	12560,0	29472,5	288419,6
2016	-	54601,4	45836,2	24,3	96717,8	60961,0	13392,5	-	5315,6	127231,0	404079,7
2017	-	58457,7	33371,3	76,8	69013,3	45804,5	14083,5	-	5638,0	79400,7	308416,6
2018	-	64096,9	9170,1	51,7	31932,5	13375,3	17382,7	-	3737,9	61426,2	201173,2
2019	-	63896,6	12196,7	2,4	30952,7	9041,5	22407,8	-	5968,1	61156,1	207319,4
2020	187,1	56693,6	3195,6	13,9	65461,7	8612,6	10444,6	-	508,5	54205,2	199322,9
2021	39,9	30972,3	6184,0	0,6	164706,6	15587,3	7127,0	-	2679,0	24068,7	251338,8
2022	54,9	40133,1	9249,8	27,0	158121,4	12348,4	22064,4	119,2	4906,1	27267,9	274292,2
2023	23739,8	40107,6	8209,8	6,4	54930,8	52403,2	7741,8	0,0	1192,2	17311,7	206029,4
2024	-	76188,0	472,7	84,4	29495,7	9557,7	5596,1	-	358,9	25279,9	147033,4

Table 3. Annual landings of small pelagic species in Ecuador (2010-2024). **Source:** IPIAP, 2025.

Fishery removals of the species in the fishery under assessment are included in the stock assessment process and therefore C1.1 is met.

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

Stock assessments for small pelagic species are conducted using estimation models, and the results are discussed in relation to different hypotheses and Biological Reference Points.

Estimations for the Pacific thread herring show that, since the mid-1990s, annual fishing mortality has generally remained below the reference fishing mortality ($F_{msy} = 0.441$), avoiding notable episodes of overexploitation. Over the same period, adult biomass is estimated to have fluctuated with low variability around the reference biomass ($B_{msy} = 70,000$ t). A slight overall increasing trend is also evident, particularly in reproductive potential (SPR) during the last decade.

For assessment purposes, 40% of the unfished adult biomass is used as the management objective. Adult biomass is estimated to average approximately 86,000 tonnes, equivalent to 49% of the unfished biomass in the most recent years. Average fishing mortality levels are estimated to be 82% below the reference fishing mortality, F_{msy} (Table 4). The Kobe plot indicates that there is practically no risk of either overfishing or the stock being in an overexploited state (Figure 5).

From the previous data it can be extracted that:

$B = 86,000$ tonnes

$B_{msy} = 70,000$ tonnes

$B/B_0 = 0.49$, therefore $B_0 = 175,510$ and $B_{msy}/B_0 = 0.4$

$PRI = 1/2 B_{msy} = 35,000$ tonnes; or $PRI = 0.20 B_0 = 35,102$ tonnes

Following the MarineTrust assessment guidance, in the case where B_{msy} is analytically determined to be greater than $40\%B_0$, and there is no analytical determination of the PRI, the default PRI should be $1/2 B_{msy}$ which in this case would be 35,000 tonnes. And, in the case where B_{msy} is analytically determined to be lower than $40\%B_0$ (as in some highly productive stocks), and there is no analytical determination of the PRI, the default PRI should be $20\%B_0$ (unless $B_{msy} < 27\%B_0$), which in this case would be 35,102 tonnes. Since B_{msy}/B_0 is 40%, both scenarios are considered. **Therefore, the species can be considered, in its most recent stock assessment, to have a biomass above the limit reference point and therefore C1.2 is met.**

Año	Biomasa	R R0	Fcr	F Fmrs	B Brms	B B0	SPR
2001	63669	0.36	0.31	0.71	0.90	0.36	0.41
2002	52450	0.76	0.20	0.44	0.74	0.30	0.41
2003	55562	0.50	0.11	0.24	0.79	0.32	0.49
2004	64664	0.56	0.12	0.26	0.92	0.37	0.60
2005	70765	0.58	0.10	0.24	1.00	0.40	0.67
2006	74479	0.65	0.21	0.48	1.06	0.42	0.70
2007	74093	0.75	0.17	0.39	1.05	0.42	0.68
2008	74985	0.41	0.32	0.71	1.06	0.43	0.67
2009	66146	0.45	0.33	0.74	0.94	0.38	0.59
2010	53713	0.73	0.70	1.58	0.76	0.31	0.50
2011	44234	0.98	0.40	0.91	0.63	0.25	0.41
2012	53261	0.83	0.54	1.22	0.76	0.30	0.46
2013	59537	0.62	0.18	0.41	0.85	0.34	0.46
2014	70060	0.69	0.31	0.70	0.99	0.40	0.52
2015	67201	0.55	0.47	1.06	0.95	0.38	0.50
2016	59687	0.57	0.14	0.31	0.85	0.34	0.46
2017	62883	0.61	0.39	0.88	0.89	0.36	0.51
2018	59378	0.63	0.11	0.26	0.84	0.34	0.50
2019	67089	0.51	0.19	0.42	0.95	0.38	0.58
2020	70273	0.64	0.08	0.18	1.00	0.40	0.62
2021	78206	0.96	0.09	0.20	1.11	0.44	0.69
2022	86755	0.51	0.23	0.52	1.23	0.49	0.73
2023	86922	0.72	0.08	0.18	1.23	0.49	0.70

Table 4. Estimates of adult biomass, recruitment, fishing mortality, depletion of unfished adult biomass, and spawning potential ratio (SPR) for the Pacific thread herring. **Source:** Canales C. M. and Jurado, V., 2024.

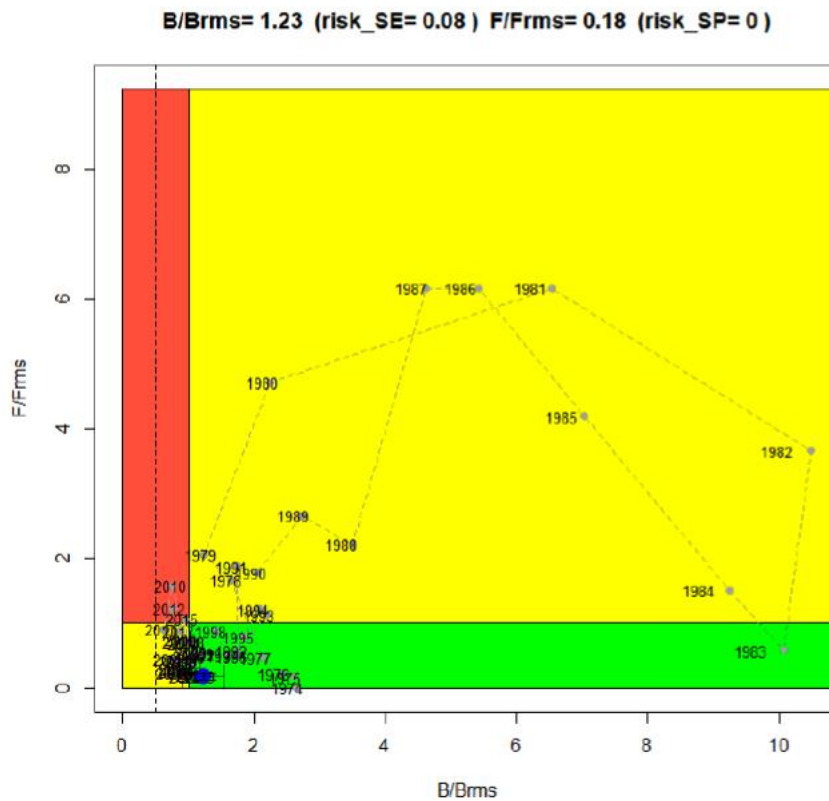


Figure 5. Kobe plot for the Pacific thread herring (*Opisthonema spp.*). rms=msy, SE=overexploitation; and SP= overfishing. **Source:** Canales C. M. and Jurado, V., 2024.

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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

MarinTrust By-Product assessment criteria, Version 3.2 (2025)

Species name		Pacific chub mackerel/macarela (<i>Scomber japonicus</i>)	
Fishing area and stock		FAO 87 - Ecuador	
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 already described, the small pelagic fishery in Ecuador has substantial volumes of data and information available. In order to provide population estimates for assessment purposes, data series from biological sampling, size compositions, abundance indices, landings, acoustic surveys, and biological parameters of Ecuador’s small pelagic resources were analyzed. The landing data correspond to the period 1975–2023. For the 1980s, the data were obtained from the validation and recalculation process of catch data. From the 1990s through 2022, catches recorded in the factory landing database were used. These data were generated from the daily fishing reports submitted by the various processing companies, together with the monthly field sampling database. In addition, from 2016 onwards, information from the fishing database of the Observer Program for the purse-seine sardine fleet was incorporated. Catches are assumed to have a very low level of error and to accurately represent the actual removals from the fishery. As a measure of uncertainty, a coefficient of variation of 5% is assigned to the catch data. Catches of Pacific chub mackerel/macarela (<i>Scomber japonicus</i>) are shown in Table 3 above. Fishery removals of the species in the fishery under assessment are included in the stock assessment process and therefore C1.1 is met.			
C1.2 The species is considered, in its most recent stock assessment, to have a biomass above the limit reference point (or proxy), OR removals by the fishery under assessment are considered by scientific authorities to be negligible.			
The time series of the annual fishing mortality shows that the overfishing threshold was exceeded only in 2022, and that the major changes in the population have been driven by fluctuations in recruitment. The reference fishing mortality (Fmsy) is estimated at 0.331. Since 2005, adult biomass is estimated to have fluctuated around Bmsy, with a slight declining trend over the last two years. Biomass has remained predominantly above or around the reference biomass, Bmsy. The most recent stock status indicates that spawning potential (SPR) declined to 40% of the level that would have existed in the absence of fishing, while the overexploitation ratio			

(B/B_{msy}) indicates that the stock fell below the reference biomass level only during the two most recent years. This decline is explained by the evidence of overfishing mentioned above.

For assessment purposes, 40% of the unfished adult biomass is used as the management objective. A spawning biomass of B_{msy} = 374,000 tonnes and a Maximum Sustainable Yield (msy) of 220,000 tonnes were estimated as proxies for MSY reference points. Adult biomass is estimated to average around 352,000 tonnes, equivalent to 38% of the unfished biomass, which is slightly below the target level. Similarly, average fishing mortality levels are estimated to be 64% below the reference fishing mortality, F_{msy} (Table 5). The Kobe plot indicates that there is no risk of overfishing, while the risk of the stock being in an overexploited state is estimated at 61% (Figure 6).

From the previous data it can be extracted that:

B= 352,000 tonnes

B_{msy}=374,000 tonnes

B/B₀=0.38, therefore B₀=926315 and B_{msy}/B₀=0.4

PRI=1/2 B_{msy}= 187,000 tonnes; or PRI=0.20 B₀=185,263 tonnes

Following the MarinTrust assessment guidance, in the case where B_{msy} is analytically determined to be greater than 40%B₀, and there is no analytical determination of the PRI, the default PRI should be ½B_{msy} which in this case would be 187,000 tonne. And, in the case where B_{msy} is analytically determined to be lower than 40%B₀ (as in some highly productive stocks), and there is no analytical determination of the PRI, the default PRI should be 20%B₀ (unless B_{MSY}<27%B₀), which in this case would be 185,263 tonnes. Since B_{msy}/B₀ is 40%, both are considered. **Therefore, the species can be considered, in its most recent stock assessment, to have a biomass above the limit reference point and therefore C1.2 is met.**

Año	Biomasa	R R0	Fcr	F Fmrs	B Brms	B B0	SPR
2001	833247	0.39	0.11	0.32	2.22	0.89	0.8
2002	676180	0.95	0.03	0.08	1.8	0.72	0.76
2003	584895	0.64	0.06	0.17	1.56	0.62	0.78
2004	528133	1.28	0.08	0.25	1.41	0.56	0.79
2005	529994	0.48	0.2	0.59	1.41	0.56	0.78
2006	510254	0.49	0.06	0.17	1.36	0.54	0.72
2007	583681	0.64	0.07	0.21	1.55	0.62	0.75
2008	558114	1.32	0.04	0.11	1.49	0.59	0.75
2009	532321	0.51	0.06	0.18	1.42	0.57	0.78
2010	559195	0.62	0.07	0.23	1.49	0.6	0.8
2011	623277	1.16	0.05	0.17	1.66	0.66	0.81
2012	609018	1.08	0.07	0.22	1.62	0.65	0.81
2013	598166	0.88	0.15	0.45	1.59	0.64	0.8
2014	623948	0.49	0.14	0.43	1.66	0.66	0.77
2015	647471	0.56	0.16	0.49	1.72	0.69	0.74
2016	603937	0.46	0.17	0.53	1.61	0.64	0.7
2017	512977	0.81	0.15	0.46	1.37	0.55	0.65
2018	451723	0.58	0.07	0.21	1.2	0.48	0.64
2019	450408	0.89	0.03	0.08	1.2	0.48	0.68
2020	495742	0.62	0.12	0.37	1.32	0.53	0.76
2021	482873	0.95	0.32	0.97	1.28	0.51	0.74
2022	408074	0.81	0.38	1.14	1.09	0.43	0.6
2023	352837	1	0.12	0.36	0.94	0.38	0.51

Table 5. Estimates of adult biomass, recruitment, fishing mortality, depletion of unfished adult biomass, and spawning potential ratio (SPR) for the Pacific chub mackerel. **Source:** Canales C. M. and Jurado, V., 2024.

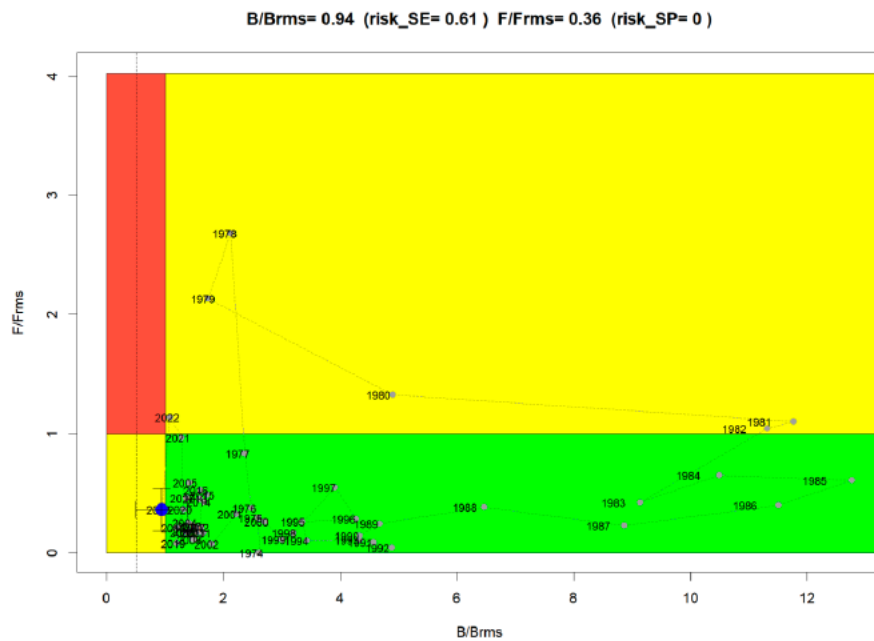


Figure 6. Kobe plot for the Pacific chub mackerel (*Scomber japonicus*). rms=msy, SE=overexploitation; and SP= overfishing. **Source:** Canales C. M. and Jurado, V., 2024.

References

IPIAP (2025) Estadísticas pesqueras 2025

https://institutopesca.gob.ec/wp-content/uploads/2025/11/1.-URP_DesempPPP_2010-2024.pdf

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

MarinTrust By-Product assessment criteria, Version 3.2 (2025)

Species name		Sardina redonda (<i>Etrumeus acuminatus</i>)	
Fishing area and stock		FAO 87 - Ecuador	
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 already explained above, the small pelagic fishery in Ecuador has substantial volumes of data and information available. In order to provide population estimates for assessment purposes, data series from biological sampling, size compositions, abundance indices, landings, acoustic surveys, and biological parameters of Ecuador’s small pelagic resources were analyzed. The landing data correspond to the period 1975–2023. For the 1980s, the data were obtained from the validation and recalculation process of catch data. From the 1990s through 2022, catches recorded in the factory landing database were used. These data were generated from the daily fishing reports submitted by the various processing companies, together with the monthly field sampling database. In addition, from 2016 onwards, information from the fishing database of the Observer Program for the purse-seine sardine fleet was incorporated. Catches are assumed to have a very low level of error and to accurately represent the actual removals from the fishery. As a measure of uncertainty, a coefficient of variation of 5% is assigned to the catch data. Catches of Pacific chub mackerel/macarela (<i>Scomber japonicus</i>) are shown in Table 3 above. Fishery removals of the species in the fishery under assessment are included in the stock assessment process and therefore C1.1 is met.			
C1.2 The species is considered, in its most recent stock assessment, to have a biomass above the limit reference point (or proxy), OR removals by the fishery under assessment are considered by scientific authorities to be negligible.			
Biomass is estimated to have remained significantly above the reference biomass (Bmsy), with episodes of overexploitation occurring only during the 2014–2017 period. Since 2017, biomass has shown a slight but sustained increase. This increase is also reflected in the adult biomass that would have existed in the absence of fishing. The spawning potential ratio (SPR) values are around 77% of the adult biomass that would have existed in the absence of fishing. The management objective for this fishery is to maintain 40% of the unfished adult biomass. The estimated adult biomass of approximately 19,000 tonnes is equivalent to 64% of the unfished biomass and is 40% above the target biomass (Bmsy). Average fishing mortality levels are estimated to be 90% below the reference fishing mortality, Fmsy (Figure 6). The Kobe plot indicates that there			

is no risk of either overfishing or the stock being in an overexploited state (Figure 7). **Therefore, the species can be considered, in its most recent stock assessment, to have a biomass above the limit reference point and therefore C1.2 is met.**

Año	Biomasa	R R0	Fcr	F Fmrs	B Brms	B B0	SPR
2001	25374.0	1.04	0.00	0.00	2.15	0.86	0.72
2002	27380.3	0.77	0.02	0.04	2.31	0.93	0.82
2003	26352.7	0.65	0.03	0.08	2.23	0.89	0.87
2004	21612.5	1.02	0.19	0.41	1.83	0.73	0.79
2005	19675.7	0.49	0.21	0.45	1.66	0.67	0.74
2006	19275.4	0.77	0.02	0.04	1.63	0.65	0.79
2007	19216.3	0.39	0.02	0.05	1.62	0.65	0.85
2008	16420.7	0.82	0.13	0.29	1.39	0.56	0.81
2009	16873.7	0.60	0.05	0.11	1.43	0.57	0.84
2010	16955.6	1.10	0.09	0.19	1.43	0.57	0.83
2011	19030.9	0.35	0.07	0.15	1.61	0.64	0.85
2012	18097.1	1.24	0.07	0.15	1.53	0.61	0.84
2013	20243.8	1.18	0.10	0.22	1.71	0.68	0.83
2014	15930.5	0.90	0.57	1.23	1.35	0.54	0.57
2015	11256.7	0.73	0.67	1.46	0.95	0.38	0.39
2016	10319.8	0.64	0.40	0.86	0.87	0.35	0.38
2017	9356.7	1.34	0.51	1.11	0.79	0.32	0.37
2018	14082.3	0.37	0.18	0.38	1.19	0.48	0.51
2019	14987.7	0.44	0.07	0.15	1.27	0.51	0.60
2020	14955.3	1.08	0.03	0.05	1.26	0.51	0.69
2021	17161.9	0.97	0.12	0.26	1.45	0.58	0.75
2022	17957.5	0.67	0.20	0.43	1.52	0.61	0.72
2023	18985.3	1.07	0.05	0.11	1.61	0.64	0.77

Table 6. Estimates of adult biomass, recruitment, fishing mortality, depletion of unfished adult biomass, and spawning potential ratio (SPR) for the Pacific chub mackerel. **Source:** Canales C. M. and Jurado, V., 2024.

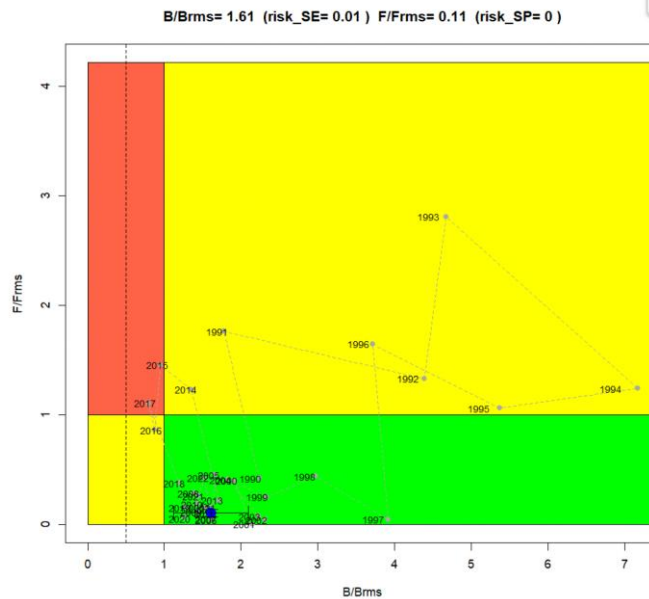


Figure 7. Kobe plot for the Sardina redonda (*Etrumeus acuminatus*). rms=msy, SE=overexplotation; and SP= overfishing. **Source:** Canales C. M. and Jurado, V., 2024.

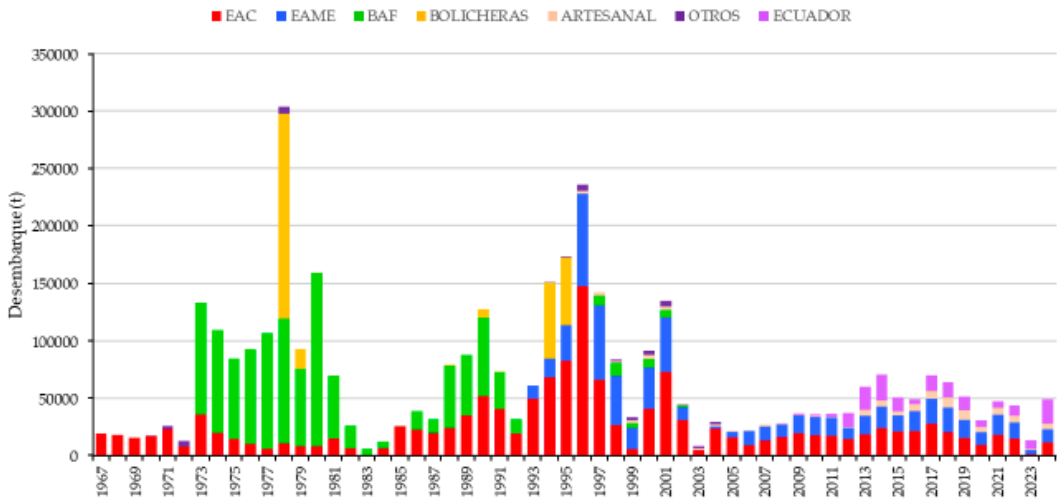
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IPIAP (2025) Estadísticas pesqueras 2025

https://institutopesca.gob.ec/wp-content/uploads/2025/11/1.-URP_DesempPPP_2010-2024.pdf

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

Species name		South Pacific hake (<i>Merluccius gayi</i>)
Fishing area and stock		FAO 87 - northern-central coast of Peru and off the coast of Ecuador
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. The hake stock assessment considers the existence of a single stock unit, distributed along the northern-central coast of Peru and off the coast of Ecuador. Within this framework, landings recorded in both countries were included in the assessment (Figure 8). The information on the industrial hake fishery collected includes fishing trip data (date and port of departure and arrival), details of fishing hauls or trawl sets (geographical coordinates, time, depth, among other information), catch composition by haul, and landing records. Information on landings from the artisanal hake fishery collects information on individual fishing trips, fishing gear, and other relevant data.		
		
Figure 8. Hake landings by fleet type during the period 1971–2024. Source: IMARPE, 2025. Fishery removals of the species in the fishery under assessment are included in the stock assessment process and therefore C1.1 is met.		

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

Two versions of the model were developed. The first version considers only the abundance indices estimated from stock assessment survey data, covering the period 2004–2020 (Calibration 1). The second version, in addition to the survey indices, incorporates abundance indices estimated from data collected during hake fishing operations (Calibration 2). The estimated mean biomass for 2025 was 158,148 t and 219,852 t for Calibrations 1 and 2, respectively (Figure 9). Both models provide similar estimates up to 2017. From 2018 onwards, the biomass estimated under Calibration 2 is higher, a difference mainly attributed to discrepancies in the recruitment estimates produced by the two approaches.

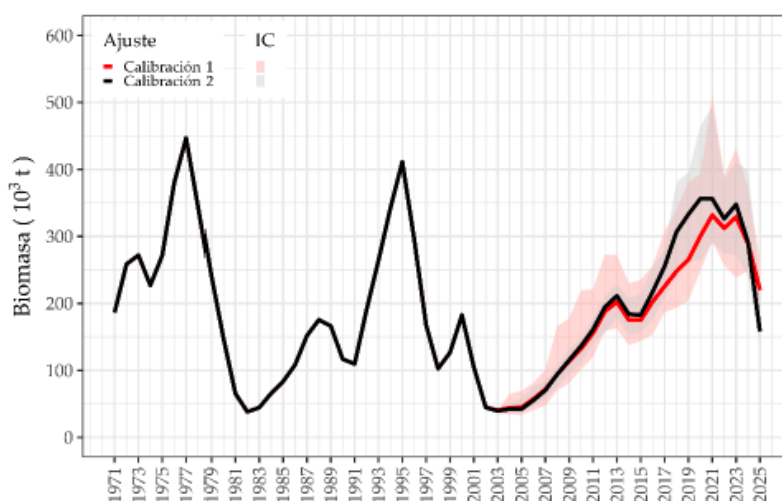


Figure 9. Mean hake biomass (tonnes) estimated under the two calibration approaches. **Source:** IMARPE, 2025.

The Thompson and Bell short-term projection model was applied to estimate the corresponding changes in the main biological reference points (BRPs), as well as the population yield (LMCTP). The results are presented in Table 7 and 8.

Escenario	F- multiple	F bar 2-5	Rend (t)_2025	SSB med_2025	SSB med_2026	Tasa Explo	%Incr SSB
Fmax (2009)	0.71	0.481	35,887	68,537	73,445	0.32	7.16
F0,1 (2009)	0.38	0.258	21,344	75,764	93,700	0.19	23.67
Texplo 0.08	0.15	0.102	9,115	81521	112522	0.08	38.03
Texplo 0.09	0.17	0.115	10,223	81010	110751	0.09	36.71
Texplo 0.10	0.19	0.129	11,336	80495	108985	0.10	35.39
Texplo 0.11	0.21	0.142	12,453	79975	107225	0.11	34.07
Texplo 0.12	0.23	0.156	13,575	79452	105472	0.12	32.75
Texplo 0.13	0.25	0.170	14,700	78924	103726	0.13	31.42
Texplo 0.14	0.27	0.185	15,829	78393	101989	0.14	30.10
Texplo 0.15	0.30	0.200	17,004	77838	100196	0.15	28.72
Texplo 0.16	0.32	0.214	18,094	77320	98545	0.16	27.45
Texplo 0.17	0.34	0.229	19,230	76779	96838	0.17	26.13
Texplo 0.18	0.36	0.245	20,364	76235	95148	0.18	24.81
Texplo 0.19	0.39	0.260	21,495	75691	93477	0.19	23.50
Texplo 0.20	0.41	0.276	22,627	75145	91819	0.20	22.19

Table 7. Decision table under different exploitation scenarios for the biological year 1 July 2025–30 June 2026 (Calibration 1). **Source:** IMARPE (2025)

Escenario	F- multiple	Fbar 2-5	Rend (t) 2025	SSB med 2025	SSB med 2026	Tasa Explo	% Incr SSB
Fmax (2009)	0.67	0.481	33,774	118,117	114,475	0.32	-3.08
F0,1 (2009)	0.36	0.258	19,602	124,418	135,291	0.19	8.74
Texplo 0.08	0.14	0.103	8,259	129220	153356	0.08	18.68
Texplo 0.09	0.16	0.116	9,268	128801	151697	0.09	17.78
Texplo 0.10	0.18	0.129	10,286	128376	150034	0.10	16.87
Texplo 0.11	0.20	0.143	11,312	127947	148367	0.11	15.96
Texplo 0.12	0.22	0.157	12,346	127513	146698	0.12	15.05
Texplo 0.13	0.24	0.171	13,389	127073	145027	0.13	14.13
Texplo 0.14	0.26	0.185	14,438	126629	143355	0.14	13.21
Texplo 0.15	0.28	0.198	15,413	126215	141812	0.15	12.36
Texplo 0.16	0.30	0.216	16,639	125692	139886	0.16	11.29
Texplo 0.17	0.32	0.230	17,631	125267	138338	0.17	10.43
Texplo 0.18	0.34	0.245	18,708	124804	136668	0.18	9.51
Texplo 0.19	0.37	0.261	19,789	124337	135003	0.19	8.58
Texplo 0.20	0.39	0.277	20,870	123869	133351	0.20	7.66

Table 8. Decision table under different exploitation scenarios for the biological year 1 July 2025–30 June 2026 (Calibration 2). **Source:** IMARPE (2025)

Where:

Escenario (Scenario): Indicates the reference point considered under each scenario (BRP and/or exploitation rate).

Fbar 2–5: Mean fishing mortality for age groups 2–5.

Rend (Yield) (t) 2025: Total yield (t) for the biological year July 2025–June 2026 (LMCTP).

Mean SSB 2025: Mean spawning stock biomass (SSB) (t) as of June 2025.

Mean SSB 2026: Mean spawning stock biomass (SSB) (t) as of June 2026.

Tasa Explo (Exploitation rate): Exploitation rate applied to the stock, expressed as the ratio between M and Z.

% Increase in SSB: Percentage increase in spawning stock biomass.

The precautionary approach (FAO, 1997) for this situation was applied, which recommends exercising caution when selecting the level of exploitation. Accordingly, it was considered prudent to set the exploitation rate within the range of 0.15 to 0.18.

Using the aforementioned exploitation rates, stochastic recruitment projections (Monte Carlo method) were carried out under both calibration approaches. These projections allow the trend in hake spawning stock biomass (SSB) to be projected, showing that this strategy would maintain SSB above the biological reference point (BRP) established during the International Panel of Experts on Hake Assessment (Figure 10).

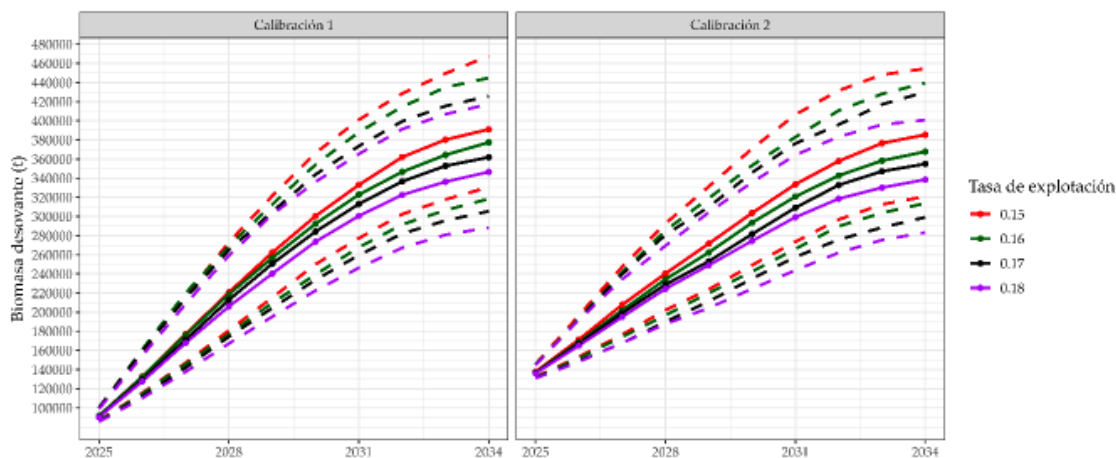


Figure 10. Medium-term stochastic projections of hake spawning stock biomass (Biomasa desovante) (SSB). **Source:** IMARPE (2025).

The stock assessment concludes that, although the results indicate a reduction in the biomass available within the Peruvian Maritime Domain, biomass remains above the biological reference points.

Therefore, the species is considered, in its most recent stock assessment, to have a biomass above the limit reference point. **C1.2 is met.**

References

IMARPE (2025). Análisis De La Pesquería, Estado Poblacional Y Proyecciones De Pesca De La Merluza Peruana, Julio 2025 – Junio 2026

<https://www.gob.pe/institucion/imarpe/informes-publicaciones/7102842-informe-correspondiente-al-oficio-n-1479-2025>

Species name		Botella (frigate and bullet tunas, <i>Auxis thazard</i> and <i>Auxis rochei</i>)	
Fishing area and stock		FAO 87 - Ecuador	
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 already described, the small pelagic fishery in Ecuador has substantial volumes of data and information available. In order to provide population estimates for assessment purposes, data series from biological sampling, size compositions, abundance indices, landings, acoustic surveys, and biological parameters of Ecuador’s small pelagic resources were analyzed. The landing data correspond to the period 1975–2023. For the 1980s, the data were obtained from the validation and recalculation process of catch data. From the 1990s through 2022, catches recorded in the factory landing database were used. These data were generated from the daily fishing reports submitted by the various processing companies, together with the monthly field sampling database. In addition, from 2016 onwards, information from the fishing database of the Observer Program for the purse-seine sardine fleet was incorporated. Catches are assumed to have a very low level of error and to accurately represent the actual removals from the fishery. As a measure of uncertainty, a coefficient of variation of 5% is assigned to the catch data. Catches of Botella (frigate and bullet tunas, <i>Auxis thazard</i> and <i>Auxis rochei</i>) are shown in Table 3 above. Fishery removals of the species in the fishery under assessment are included in the stock assessment process and therefore C1.1 is met.			
C1.2 The species is considered, in its most recent stock assessment, to have a biomass above the limit reference point (or proxy), OR removals by the fishery under assessment are considered by scientific authorities to be negligible.			
In most years, biomass has remained significantly above the reference biomass, Bmsy (Table 9). Annual fishing mortality shows a sustained increase, with fishing mortality exceeding the reference fishing mortality, Fmsy, in some years during the last decade (Table 9). In terms of spawning potential ratio (SPR), the results indicate values around 42% of the adult biomass that would have existed in the absence of fishing (Table 9). The management objective for this fishery is to maintain 40% of the unfished adult biomass. A spawning biomass of Bmsy = 69,000 tonnes and a Maximum Sustainable Yield (MSY) of 41,000			

tonnes were estimated as proxies for MSY-based reference points. The fishing mortality rate consistent with this management objective was estimated at $F_{msy} = 0.70$ (Table 9).

Adult biomass is estimated to average approximately 74,000, equivalent to 43% of the unfished biomass. Average fishing mortality is estimated to be 10% below the reference fishing mortality, F_{msy} (Table 9). Nevertheless, the Kobe plot and associated uncertainty measures indicate that the risks of overfishing and overexploitation are moderate, at 32% and 37%, respectively (Figure 11).

From the previous data it can be extracted that:

$B = 74,000$ tonnes

$B_{msy} = 69,000$ tonnes

$B/B_0 = 0.43$, therefore $B_0 = 172,093$ and $B_{msy}/B_0 = 0.4$

$PRI = 1/2 B_{msy} = 34,500$ tonnes; or $PRI = 0.20 B_0 = 34,419$ tonnes

Following the MarineTrust assessment guidance, in the case where B_{msy} is analytically determined to be greater than $40\%B_0$, and there is no analytical determination of the PRI, the default PRI should be $\frac{1}{2}B_{msy}$ which in this case would be 34,500 tonnes. And, in the case where B_{msy} is analytically determined to be lower than $40\%B_0$ (as in some highly productive stocks), and there is no analytical determination of the PRI, the default PRI should be $20\%B_0$ (unless $B_{MSY} < 27\%B_0$), which in this case would be 34,419 tonnes. Since B_{msy}/B_0 is 40%, both scenarios are considered. **Therefore, the species can be considered, in its most recent stock assessment, to have a biomass above the limit reference point and therefore C1.2 is met.**

Año	Biomasa	R R0	Fcr	F Fmrs	B Brms	B B0	SPR
2001	144088	0.81	0.05	0.08	2.07	0.83	0.80
2002	142320	0.41	0.06	0.09	2.04	0.82	0.84
2003	130768	0.83	0.30	0.42	1.87	0.75	0.83
2004	93184	0.57	0.25	0.35	1.34	0.53	0.67
2005	84893	1.05	0.08	0.11	1.22	0.49	0.65
2006	91221	0.95	0.17	0.24	1.31	0.52	0.71
2007	103736	1.07	0.30	0.43	1.49	0.59	0.75
2008	108941	1.18	0.25	0.35	1.56	0.62	0.72
2009	117830	1.21	0.43	0.61	1.69	0.68	0.71
2010	119614	1.52	0.42	0.61	1.71	0.69	0.66
2011	124842	1.21	0.51	0.73	1.79	0.72	0.63
2012	130179	1.17	0.67	0.95	1.87	0.75	0.60
2013	121316	0.79	0.34	0.48	1.74	0.70	0.54
2014	125467	2.17	0.43	0.62	1.80	0.72	0.57
2015	112127	1.05	0.72	1.02	1.61	0.64	0.53
2016	121313	1.36	0.55	0.79	1.74	0.70	0.51
2017	117366	0.86	0.68	0.97	1.68	0.67	0.48
2018	100359	0.97	0.86	1.23	1.44	0.58	0.42
2019	78564	0.89	0.31	0.44	1.13	0.45	0.35
2020	86804	0.68	0.89	1.27	1.24	0.50	0.43
2021	67722	0.96	0.57	0.82	0.97	0.39	0.36
2022	63937	2.90	0.85	1.22	0.92	0.37	0.38
2023	74671	0.93	0.63	0.90	1.07	0.43	0.42

Table 9. Estimates of adult biomass, recruitment, fishing mortality, depletion of unfished adult biomass, and spawning potential ratio (SPR) for botella. **Source:** Canales C. M. and Jurado, V., 2024.

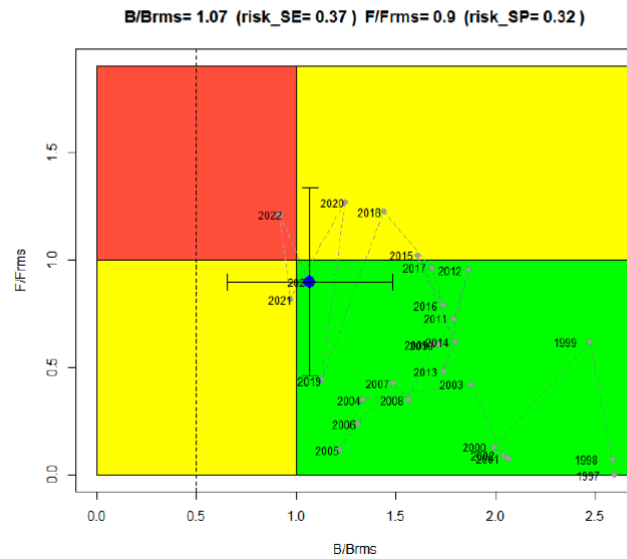


Figure 11. Kobe plot for botella (*Auxis thazard* and *Auxis rochei*). rms=msy, SE=overexploitation; and SP= overfishing. **Source:** Canales C. M. and Jurado, V., 2024.

References

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https://institutopesca.gob.ec/wp-content/uploads/2025/11/1.-URP_DesempPPP_2010-2024.pdf

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

Traceability information

Information provided for Step 3 Path 1 or Path 2

Species name		<i>Thunnus albaceres, Thunnus obesus, Katsuwonus pelamis</i>		
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 Risk downgraded to Medium Risk
	Ecuador	2.63	2.11	
	Panama	1.69	1.67	
	Nicaragua	2.25	1.44	
	Other FAO 77 & 87 countries	Medium Risk	N/A	

Species name		<i>Scomber japonicus, Auxis spp., Opisthonema spp., Etrumeus acuminatus, Merluccius gayi</i>		
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 Risk downgraded to Medium Risk
	Ecuador	2.63	2.11	
	Other FAO 87 Countries	Medium Risk	N/A	

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 does 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.