MarinTrust Standard V2

By-product Fishery Assessment
Yellowfin Tuna
FAO Areas 77, and 87

Table 1 Application details and summary of the assessment outcome

Fishery Under Assessment	Species:	Yellowfin Tuna, *Thunnus albacares*
	Geographical area:	FAO 77 Pacific, Eastern Central FAO 87 Pacific, Southeast
	Country of origin of the product:	El Salvador, Ecuador, Spain, USA, Phillipines, Panama, Portugal (Flag Countries)
	Stock:	Western Central Pacific Ocean (WCPO) Yellowfin Tuna Eastern Pacific Ocean (EPO) Yellowfin Tuna
Date	April 21, 2022	
Report Code	SLV02	
Assessor	Ivan Mateo, Ph.D.	
Country of origin of the product - PASS	El Salvador, Ecuador, Spain, USA, Phillipines, Panama, Portugal (Flag Countries)	
Country of origin of the product - FAIL	NA	

Application details and summary of the assessment outcome			
Company Name(s): Calvo Conseras SA			
Country: El Salvador			
Email address:		Applicant Code:	
Certification Body Details			
Name of Certification Body:		Global Trust Certification	
Assessor	Peer Reviewer	Assessment Days	Initial/Surveillance/ Re-approval
Ivan Mateo, Ph.D.	Conor Donnelly	0.5	Surveillance 2
Assessment Period	To April 2022		

Scope Details	
Main Species	Yellowfin tuna, *Thunnus albacares*
Stock	Western Central Pacific Ocean (WCPO) Yellowfin Tuna Eastern Pacific Ocean (EPO) Yellowfin Tuna
Fishery Location	FAO 77 (Pacific, Eastern Central) FAO 87 (Pacific, Southeast)
Management Authority (Country/ State)	The Western and Central Pacific Fisheries Commission (WCPFC) The Inter-American Tropical Tuna Commission (IATTC).
Gear Type(s)	Longlines and purse seines
Outcome of Assessment	
Peer Review Evaluation	Agree with recommendation
Recommendation	APPROVED

Table 2. Assessment Determination

Assessment Determination
If any species is categorised as Endangered or Critically Endangered on IUCN's Red List, or if it appears in the CITES appendices, it cannot be approved for use as Marin Trust raw material. Yellowfin tuna does not appear as Endangered or Critically Endangered on IUCN's Red List, nor does it appear in CITES appendices; therefore, product originating from this fishery is eligible for approval for use as MarinTrust by-product raw material. Yellowfin tuna (*Thunnus albacares*) is listed on the IUCN Red List as globally Near Threatened (NT) and is not listed in CITES such that yellowfin derived products are eligible for approval for use as MarinTrust by-product raw material. For assessment and management purposes, two discrete stocks of yellowfin are recognised in the Pacific Ocean delimited based on their being east and west of 150°W longitude: 1. Western Central Pacific Ocean (WCPO) yellowfin (west of 150°W), managed via the Western and Central Pacific Fisheries Commission (WCPFC). 2. Eastern Pacific Ocean (EPO) yellowfin (east of 150°W), managed by the Inter-American Tropical Tuna Commission (IATTC). FAO areas 77 and 87 have their western boundary at 175°W such that yellowfin tuna taken in these areas may come from either of the Western Central Pacific or Eastern Pacific stocks; therefore, both stocks are considered in this assessment. Fishery removals of both Pacific yellowfin tuna stocks are considered in their respective stock assessment processes such that the fishery **PASSES** Clause C1.1. As of the latest assessments, both stocks are considered to have a biomass above their respective limit reference points such that the fishery **PASSES** Clause C1.2. As both Clause C1.1 and C1.2 are met, the by-product covered by this report is **APPROVED** for the production of fishmeal and fish oil under the current MarinTrust v 2.0 by-product standard.
Fishery Assessment Peer Review Comments
The assessor correctly classified Western Central Pacific Ocean (WCPO) yellowfin (west of 150°W) and Eastern Pacific Ocean (EPO) yellowfin (east of 150°W) as category C, the stocks are managed, and reference points are defined to assess stock status against. Fishery removals from the stocks are considered in the stock assessment process. The most recent stock assessments show that the stocks are considered to have a biomass above their limit reference points. Therefore, they pass both C1.1 and C1.2 and are approved.
Notes for On-site Auditor

Species Categorisation

NB: If any species is categorised as Endangered or Critically Endangered on the IUCN Red List, or if it appears in CITES Appendix 1, it **cannot** be approved for use as an MarinTrust raw material.

IUCN Red list Category

By-product material from a species listed by IUCN (the International Union for Conservation of Nature) under the Red List for the following categories shall immediately fail the assessment;

- EXTINCT (E) AND EXTINCT IN THE WILD (EW)

- CRITICALLY ENDANGERED (CR) facing an extremely high risk of extinction in the wild.

- ENDANGERED (EN) facing a very high risk of extinction in the wild.

By-product material may be used from the following categories provided that all clauses in the MarinTrust standard are passed.

- VULNERABLE (VU) facing a high risk of extinction in the wild.

- NEAR THREATENED (NT) does not qualify for above now, but is close or is likely to qualify for, a threatened category in the near future.

- LEAST CONCERN (LC) Widespread and abundant.

- DATA DEFICIENT (DD) and NOT EVALUATED (NE)

Table 3 Species Categorisation Table

Common name	Latin name	Stock	Management	Category	IUCN Red List Category[1]	CITES Appendix 1[2]
Yellowfin tuna	*Thunnus albacares*	WCPO and EPO yellowfin tuna	WCPFC and IATTC	C	Globally: Near Threatened (NT)	No

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[1] https://www.iucnredlist.org/
[2] https://cites.org/eng/app/appendices.php

CATEGORY C SPECIES

In a by-product assessment, Category C species are those which are subject to a species-specific management regime and are usually targeted species in fisheries for human consumption.

Clause C1 should be completed for each Category C species. If there are no Category C species in the fishery under assessment, this section can be deleted. Where a species fails this Clause, it should be assessed as a Category D species instead.

Species Name	**Yellowfin 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

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.
Western Central Pacific yellowfin tuna fishery removals of the species in the fishery under assessment are included in the stock assessment process via Western and Central Pacific Fisheries Commission (WCPFC) processes. Eastern Pacific yellowfin tuna Catches within the IATTC area of competence are reported to the IATTC (e.g. IATTC, 2020) and these catches are subsequently included in the IATTC stock assessment process.

Therefore, fishery removals of both stocks of relevance to this assessment are included in their respective stock assessment processes such that the fishery **PASSES** Clause C1.1.

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.
Western Central Pacific Yellowfin Tuna. The most recent stock assessment for WCPO yellowfin was carried out in 2020 (Vincent *et al*. 2020). The WCPFC has adopted 20% of the unfished spawning potential (20%$SB_{F=0}$) as a LRP for this stock; Stock status is evaluated by estimating $SB_{recent}/SB_{F=0}$ and $SB_{latest}/SB_{F=0}$, where SB_{latest} and SB_{recent} are the estimated spawning potential in 2018 and the mean over 2015-2018, respectively. Kobe Plots presented in Vincent *et al*. (2020), show that the status of WCP yellowfin tuna not being overfished and overfishing is not occurring. Therefore, the stock is considered, in its most recent stock assessment, to be above the limit reference point defined by management.
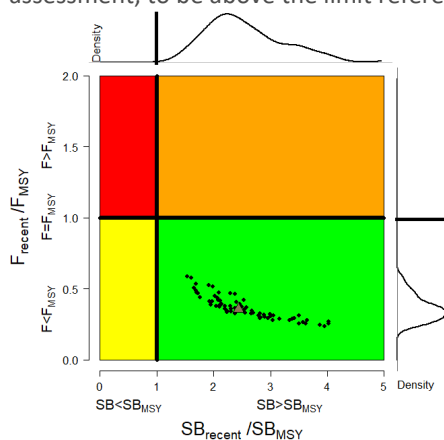

Figure 1. Kobe plot for the recent spawning potential (2015–2018) summarizing the results for each of the models in the structural uncertainty grid. The plots represent estimates of stock status in terms of spawning biomass depletion and fishing mortality relative to MSY quantities and marginal distributions of each are presented with the median of the structural uncertainty grid displayed as a brown triangle.

EPO Yellowfin Tuna

In 2020, the IATTC scientific staff completed new benchmark stock assessments for EPO Yellowfin Tuna. These assessments were conducted within a new risk analysis framework instead of the previous "best assessment" approach. The risk analysis framework employs "…a variety of reference models … to represent plausible alternative hypotheses about the biology of the fish, the productivity of the stocks, and/or the operation of the fisheries, thus effectively incorporating uncertainty into the management advice as it is formulated."

The risk analysis, is divided into: (1) an assessment of the current status of the stock; and, (2) an evaluation of the consequences of alternative management actions, specifically modifying the duration of the temporal closure of the purse-seine fishery, currently 72 days.

Current status relative to a reference point was calculated as a weighted average of the point estimates of the ratio from each of the alternative stock assessment models, with weights equal to the relative model probabilities (equal to the expected value under the normal distribution assumption made for each model). The probability of exceeding a reference point was calculated using the cumulative distribution functions (CDFs) for the ratios of Fcur and Scur relative to the reference points for each of the alternative models, which are then combined using the model probabilities.

For Yellowfin Tuna, considering the relative weights of the different models and their combined distributions for the management parameters, there is only a 9% probability that the fishing mortality corresponding to the maximum sustainable yield (F_{MSY}) has been exceeded. ($P(F_{cur}>F_{MSY})$ = 9%, **Table 1**). There is a 12% probability that the spawning stock biomass corresponding to the maximum sustainable yield (S_{MSY}) has been breached ($P(S_{cur}<S_{MSY})$ = 12%, **Table 1**). The probability that the F and S limit reference points have been exceeded is zero ($P(S_{cur}<S_{LIMIT})$ = 0%; $P(F_{cur}>F_{LIMIT})$ = 0%; **Table 1**).

TABLE 1. Management quantities for yellowfin tuna in the EPO. See explanation of codes in Table A. E(x) is the expected value. P=0.5: median of the distributions of P(S_{cur}/S_{MSY}) and P(F_{cur}/F_{MSY}).

	A. Proportional			B. Density dependence			C. Time block middle			D. Time block end			Combined	
	Base-A	EstGro-A	EstSel-A	Base-B	EstGro-B	EstSel-B	Base-C	EstGro-C	EstSel-C	Base-D	EstGro-D	EstSel-D	E(x)	P=0.5
P (Model)	0.01	0.05	0.06	0.03	0.13	0.09	0.05	0.10	0.24	0.03	0.06	0.14	1.00	
Fishing mortality (F)														
F_{cur}/F_{MSY}	1.24	0.95	0.69	1.01	0.65	0.55	0.93	0.72	0.47	0.79	0.72	0.73	0.67	0.65
$P(F_{cur}>F_{MSY})$	0.88	0.37	0.05	0.46	0.03	0.01	0.32	0.07	0.00	0.13	0.08	0.09	0.09	
F_{cur}/F_{LIMIT}	0.46	0.45	0.31	0.38	0.32	0.25	0.38	0.35	0.22	0.33	0.33	0.31	0.30	
$P(F_{cur}>F_{LIMIT})$	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Spawning biomass (S)														
S_{cur}/S_{MSY_d}	0.78	1.07	1.48	1.01	1.60	1.74	1.09	1.48	2.02	1.31	1.48	1.40	1.57	1.58
$P(S_{cur}<S_{MSY})$	0.93	0.41	0.07	0.48	0.04	0.08	0.34	0.06	0.03	0.15	0.09	0.11	0.12	
S_{cur}/S_{LIMIT}	1.87	1.96	2.60	2.62	3.24	3.70	2.33	2.53	3.25	2.99	2.94	3.08	2.98	
$P(S_{cur}<S_{LIMIT})$	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	

To be consistent with the probabilistic nature of the risk analysis and the HCR, the black dot on the Kobe plot representing the combined models is based on P(Scur/SMSY<x) = 0.5 and P(Fcur/FMSY>x) = 0.5
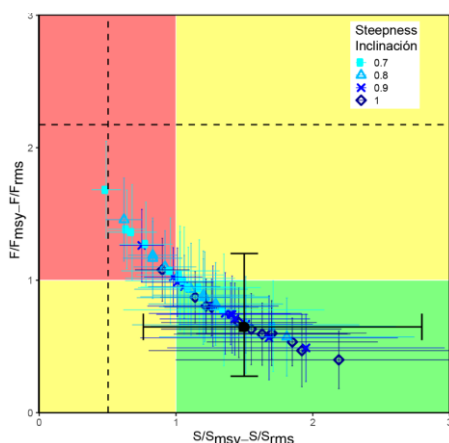

Figure 2. Kobe (phase) plot of the time series of estimates of spawning stock size (S) and fishing mortality (F) of Yellowfin Tuna relative to their MSY reference points. The colored panels are separated by the target reference points (SMSY and FMSY). Limit

reference points (dashed lines), which correspond to a 50% reduction in recruitment from its average unexploited level, based on a conservative steepness (h) of 0.75 for the Beverton-Holt stock-recruitment relationship, are merely indicative, since they vary by model and are based on all models combined. The center point for each model indicates the current stock status, based on the average fishing mortality (F) over the last three years; The solid black circle represents all models combined; to be consistent with the probabilistic nature of the risk analysis and the HCR, it is based on $P(S_{cur}/S_{LIMIT}<x) = 0.5$ and $P(F_{cur}/F_{MSY}>x) = 0.5$. The lines around each estimate represent its approximate 95% confidence interval.

Based on the above the stock is considered, in its most recent stock assessment, to be above the limit reference point defined by management. As of the latest assessments, both stocks are considered to have a biomass above their respective limit reference points such that the fishery **PASSES** Clause C1.2.

References
Vincent M, N, Ducharme-Barth, P. Hamer, J. Hampton, P. Williams, G. Pilling 2020 Stock assessment of Yellowfin Tuna in the western and central Pacific Ocean WCPFC-SC16-2020/SA-WP-04 (Rev.3).
Aires-da-Silva A, M. N. Maunder, H. Xu, C. Minte-Vera, J.L. Valero, C. E. Lennert-Cody 2020 Risk Analysis for Management of the Tropical Tuna Fishery in the Eastern Pacific Ocean IATTC DOCUMENT SAC-11-08 REV.

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

CATEGORY D SPECIES

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

D1	Species Name			
	Productivity Attribute		**Value**	**Score**
	Average age at maturity (years)			
	Average maximum age (years)			
	Fecundity (eggs/spawning)			
	Average maximum size (cm)			
	Average size at maturity (cm)			
	Reproductive strategy			
	Mean trophic level			
		Average Productivity Score		
	Susceptibility Attribute		**Value**	**Score**
	Availability (area overlap)			
	Encounterability (the position of the stock/species within the water column relative to the fishing gear)			
	Selectivity of gear type			
	Post-capture mortality			
		Average Susceptibility Score		
		PSA Risk Rating (From Table D3)		
		Compliance rating		
	Further justification for susceptibility scoring (where relevant) *For susceptibility attributes, please provide a brief rationale for scoring of parameters where there may be uncertainty affecting your decision*			
References				
Standard clauses 1.3.2.2				

Table D2 - Productivity / Susceptibility attributes and scores.

Productivity attributes	Low productivity/ High risk — Score 3	Medium productivity/ Medium risk — Score 2	High productivity/ Low risk — Score 1
Average age at maturity (years)	>4	2 to 4	<2
Average maximum age (years)	>30	10 to 30	<10
Fecundity (eggs/spawning)	<1 000	1 000 to 10 000	>10 000
Average maximum size (cm)	>150	60 to 150	<60
Average size at maturity (cm)	>150	30 to 150	<30
Reproductive strategy	Live bearer, mouth brooder or significant parental investment	Demersal spawner "berried"	Broadcast spawner
Mean trophic level	>3.25	2.5–3.25	<2.5

Susceptibility attributes		High susceptibility/ High risk — Score 3	Medium susceptibility/ Medium risk — Score 2	Low susceptibility/ Low risk — Score 1
Availability	1) Overlap of adult species range with fishery	>50% of stock occurs in the area fished	Between 25% and 50% of the stock occurs in the area fished	<25% of stock occurs in the area fished
	2) Distribution	Only in the country/ fishery	Limited range in the region	Throughout region/ global distribution
Encounterability	1) Habitat	Habitat preference of species make it highly likely to encounter trawl gear (e.g. demersal, muddy/sandy bottom)	Habitat preference of species make it moderately likely to encounter trawl gear (e.g. rocky bottom/reefs)	Depth or distribution of species make it unlikely to encounter trawl gear (e.g. epi-pelagic or meso-pelagic)
	2) Depth range	High overlap with trawl fishing gear (20 to 60 m depth)	Medium overlap with trawl fishing gear (10 to 20 m depth)	Low overlap with trawl fishing gear (0 to 10 m, >70 m depth)
Selectivity		Species >2 times mesh size or up to 4 m length	Species 1 to 2 times mesh size or 4 to 5 m length	Species <mesh size or >5 m length
Post capture mortality		Most dead or retained Trawl tow >3 hours	Alive after net hauled Trawl tow 0.5 to 3 hours	Released alive Trawl tow <0.5 hours

Note: Availability 2 is only used when there is no information for Availability 1; the most conservative score between Encounterability 1 and 2 is used.

D3		Average Susceptibility Score		
		1 - 1.75	1.76 - 2.24	2.25 - 3
Average Productivity Score	1 - 1.75	PASS	PASS	PASS
	1.76 - 2.24	PASS	PASS	TABLE D4
	2.25 - 3	PASS	TABLE D4	TABLE D4

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

Evidence

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

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

References	

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