



MarinTrust Standard V2

By-product Fishery Assessment *FAO 77, 87 Pacific Eastern Central, Southeast Yellowfin Tuna*

MarinTrust Programme

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Table 1 Application details and summary of the assessment outcome.

Fishery Under Assessment	Species:	Yellowfin Tuna, <i>Thunnus albacares</i>
	Geographical area:	FAO 77 (Pacific, Eastern Central) FAO 87 (Pacific, Southeast)
	Country of origin of the product:	USA, Cook Islands, Tokelau, Fiji, Vanuatu, Samoa, Korea (Flag Country)
	Stock:	Western Central Pacific Ocean (WCPO) Yellowfin Tuna Eastern Pacific Ocean (EPO) Yellowfin Tuna
Date	May 2022	
Report Code	VNM01	
Assessor	Vito Romito	
Country of origin of the product - PASS	USA, Cook Islands, Tokelau, Fiji, Vanuatu, Samoa, Korea (Flag Country)	
Country of origin of the product - FAIL		

Application details and summary of the assessment outcome			
Company Name(s): Thien Quynh Co Ltd			
Country: Vietnam			
Email address:		Applicant Code:	
Certification Body Details			
Name of Certification Body:		Global Trust Certification	
Assessor	Peer Reviewer	Assessment Days	Initial/Surveillance/ Re-approval
Vito Romito	Ivan Mateo	0.5	Re-approval
Assessment Period	To May 2022		

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

Table 2. Assessment Determination

Assessment Determination
<p>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 Marin Trust by-product raw material.</p> <p>For assessment and management purposes, two discrete stocks of yellowfin tuna are recognised in the Pacific Ocean delimited based on their being east and west of 150°W longitude:</p> <ol style="list-style-type: none"> 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). <p>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.</p> <p>Since the two stock are assessed they are assessed as Category C stocks. Fishery removals of both Pacific Yellowfin Tuna stocks are considered in their respective stock assessment processes such that the fishery PASSES Clause C1.1.</p> <p>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.</p> <p>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 Marin Trust v 2.0 Standard for by-products.</p>
Fishery Assessment Peer Review Comments
<p>The assessor correctly classified Western Central Pacific Ocean (WCPO) yellowfin and the Eastern Pacific Ocean (EPO) yellowfin as category C, the stocks are managed, and reference points are defined to assess the stock status against.</p> <p>Fishery removals from the stocks are considered in the stock assessment process. The most recent stock assessment shows that both stocks are considered to have a biomass well above the limit reference point. Therefore, Western Central Pacific Ocean (WCPO) yellowfin and the Eastern Pacific Ocean (EPO) yellowfin fisheries pass both C1.1 and C1.2 and therefore the Western Central Pacific Ocean (WCPO) yellowfin and the Eastern Pacific Ocean (EPO) yellowfin are approved</p>
Notes for On-site Auditor
None.

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 a 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	<i>Thunnus albacares</i>	WCPO and EPO Yellowfin Tuna	WCPFC and IATTC	C	Globally: LC	No

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 are included in the stock assessment process via Western and Central Pacific Fisheries Commission (WCPFC) processes. Eastern Pacific Yellowfin Tuna Catches of tunas 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).

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%SBF=0) as a limit reference point for this stock. The stock is currently assessed as being well above the limit reference point, as shown in the figure below.

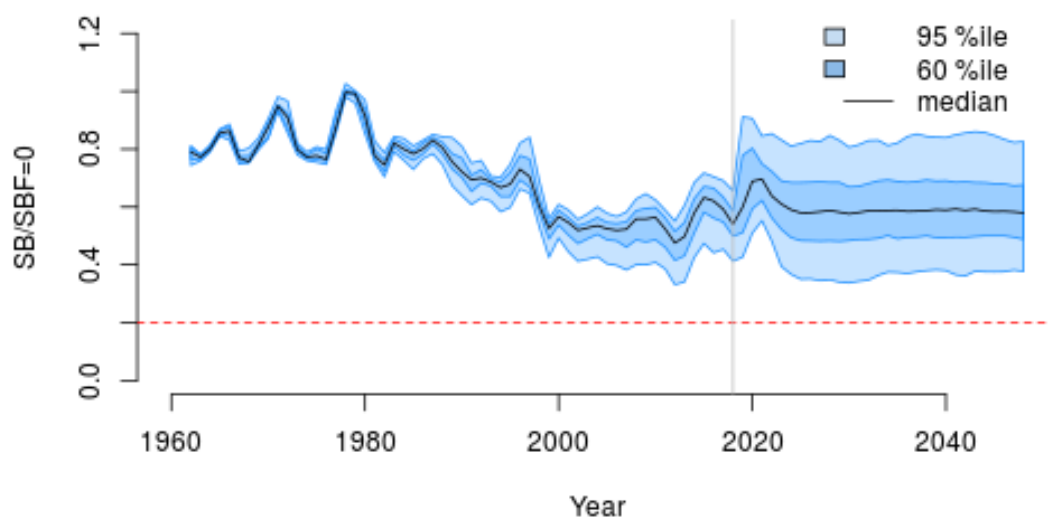


Figure 1. Time series of yellowfin tuna spawning biomass ($SB_t/SB_{t,F=0}$, where $SB_{t,F=0}$ is the average SB from $t-10$ to $t-1$) from the uncertainty grid of assessment models for the period 2000 to 2018, and stochastic projection results for the period 2019 to 2048 assuming 2016-2018/2018 fishing levels continue. Vertical gray line at 2018 represents the last year of the assessment. During the projection period (2019-2048) levels of recruitment variability are assumed to match

those over the time period used to estimate the stock-recruitment relationship (1962-2017). The red horizontal dashed line represents the agreed limit reference point.

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. For yellowfin, the overall results of the risk analysis, which include all 48 reference models, indicate only a 9% probability that the fishing mortality corresponding to the maximum sustainable yield (FMSY) has been exceeded. There is a 12% probability that the spawning stock biomass corresponding to the maximum sustainable yield (SMSY) has been breached. The probability that the F and S limit reference points have been exceeded is zero, hence the fishery is highly likely to be above the limit reference point (Table 1). The risk analysis unambiguously shows that the yellowfin stock in the EPO is healthy.

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 $P(F_{cur}/F_{MSY})$.

P (Model)	A. Proportional			B. Density dependence			C. Time block middle			D. Time block end			E(x) P=0.5	
	Base-A	EstGro-A	EstSel-A	Base-B	EstGro-B	EstSel-B	Base-C	EstGro-C	EstSel-C	Base-D	EstGro-D	EstSel-D		
	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 $P(S_{cur}/S_{MSY}<x) = 0.5$ and $P(F_{cur}/F_{MSY}>x) = 0.5$

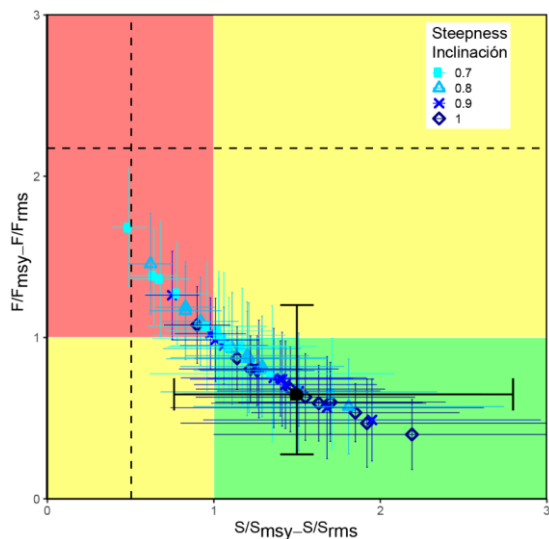


Figure 2. Kobe (phase) plot of the time series of estimates of spawning stock size (S) and fishing mortality (F) of Yellowfin Tuna relative to their MSY reference points. The colored panels are separated by the target reference points (SMSY and FMSY). Limit reference points (dashed lines), which correspond 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 $P(\text{Scur}/\text{SLIMIT} < x) = 0.5$ and $P(\text{Fcur}/\text{FMSY} > x) = 0.5$. 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. Therefore, the two stocks considered here have a biomass above the limit reference point and **pass C1.2**.

References

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. <https://www.iattc.org/GetAttachment/650968a3-f4c6-454a-8e8c-eef38fcb0dbb/Risk%20analysis%20for%20management>

CITES. 2022. Cites Appendix 1. <https://cites.org/eng/app/appendices.php>

Collette, B.B., Boustany, A., Fox, W., Graves, J., Juan Jorda, M. & Restrepo, V. 2021. Thunnus albacares. The IUCN Red List of Threatened Species 2021: e.T21857A46624561. <https://dx.doi.org/10.2305/IUCN.UK.2021-2.RLTS.T21857A46624561.en>. Accessed on 18 May 2022.

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). <https://meetings.wcpfc.int/node/11694>

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)		
	<i>For susceptibility attributes, please provide a brief rationale for scoring of parameters where there may be uncertainty affecting your decision</i>		
References			
Standard clauses 1.3.2.2			

Table D2 - Productivity / Susceptibility attributes and scores.

Productivity attributes	Low productivity/ High risk	Medium productivity/ Medium risk	High productivity/ Low risk
	Score 3	Score 2	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	Medium susceptibility/ Medium risk	Low susceptibility/ Low risk
		Score 3	Score 2	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	