MarinTrust Standard V2

By-product Fishery Assessment

Bigeye tuna (Thunnus obesus) in FAO 34, 41, 47

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Table 1 Application details and summary of the assessment outcome

Fishery Under Assessment	Species:	Bigeye tuna (*Thunnus obesus*)
	Geographical area:	FAO 34, 41, 47 Atlantic Ocean
	Country of origin of the product:	Thailand (Flag country: Senegal, Ghana, Liberia)
	Stock:	Atlantic bigeye tuna
Date	23 May 2023	
Report Code	THA04	
Assessor	Léa Lebechnech	
Country of origin of the product - PASS	Thailand (Flag country: Senegal, Ghana, Liberia)	
Country of origin of the product - FAIL	NA	

Application details and summary of the assessment outcome			
Company Name(s): Chotiwat Manufacturing Public Co. Ltd, Piyo Bhokabhan Company Limited			
Country: Thailand			
Email address:		Applicant Code:	
Certification Body Details			
Name of Certification Body:		Global Trust Certification	
Assessor	Peer Reviewer	Assessment Days	Initial/Surveillance/ Re-approval
Léa Lebechnech	Matthew Jew	0.5	Surveillance 1
Assessment Period	To May 2023		

Scope Details	
Main Species	Bigeye tuna (*Thunnus obesus*)
Stock	Atlantic bigeye tuna
Fishery Location	FAO 34, 41, 47 Atlantic Ocean
Management Authority (Country/ State)	International Commission for the Conservation of Atlantic Tunas (ICCAT) and Contracting (State) Parties
Gear Type(s)	Longline, pole & line and purse seine
Outcome of Assessment	
Peer Review Evaluation	Agree with assessor's recommendation
Recommendation	**APPROVED**

Table 2. Assessment Determination

Assessment Determination
If a 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 MarinTrust RS raw material. Bigeye tuna (*Thunnus obesus*) is not listed as Endangered or Critically Endangered on IUCN's Red List, nor it is listed in CITES appendices; therefore, Atlantic bigeye tuna is eligible for approval for use as MarinTrust RS by-product raw material.

At this point in time, it is assumed there is a single Atlantic-wide population of bigeye tuna. This is based on a lack of identified genetic heterogeneity, time/area distribution of fish and movement patterns of tagged fish, therefore, the Atlantic stock is considered in this report. This stock is managed at the international level by the International Commission for the Conservation of Atlantic Tunas (ICCAT), which ICCAT conducts stock assessments. The fishing mortality rate which, if applied constantly, would result in Maximum Sustainable Yield (MSY). ICCAT uses two reference points to determine the status of bigeye tuna populations in the Atlantic, $B_{current}/B_{MSY}$ and $F_{current}/F_{MSY}$.; so it has been assessed under Category C for this assessment.

Fishery removals of this stock are considered in the stock assessment processes so it PASSES Clause C1.1. However, the most recent stock assessment (2019) concluded that the stock is overfished at 58% and overfishing is occurring with a probability of 50%. Therefore, it FAILS Clause C1.2.

As per guidance, the stock has been assessed under category D: with an average productivity of 1.71 and susceptibility of 2.75, the stock passed the PSA risk-rating.

Therefore, Atlantic Ocean bigeye tuna (*Thunnus obesus*) in FAO zone 34, 41 and 47 is **APPROVED** for the production of fishmeal and fish oil under the current MarinTrust v 2.0 by-products standards.

Fishery Assessment Peer Review Comments

The assessor correctly classified Atlantic Ocean bigeye tuna (*Thunnus obesus*) in FAO zone 34, 41 and 47 as Category C, the stock is subject to a specific management regime and reference points are defined.

Fishery removals are considered in the stock assessment process. The most recent stock assessment shows that the stock is considered to be overfished. Therefore, the stock is considered to have biomass below the limit reference point (or proxy), so it was correctly assessed under Category D. The assessor correctly assigned values and scores on table D1. The given average attribute scores result in a passing score on Table D3.

Atlantic Ocean bigeye tuna *Thunnus obesus* in FAO zone 34, 41 and 47 passes Category D and the PSA and therefore should be approved under the MarinTrust Standard v.2.

Notes for On-site Auditor
N/A

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]
Bigeye tuna	*Thunnus obesus*	Atlantic bigeye tuna	ICCAT and Contracting (State) Parties	C	VU (Global)	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	Albacore tuna (*Thunnus alalunga*)	
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.	Yes
	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.	No
	Clause outcome:	**FAIL**

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.

A stock assessment for bigeye tuna was conducted in 2021 (Anon. 2021a) using fishery data from the 1950-2020 period and through a process that included a data preparatory meeting in April and an assessment meeting in July. The stock assessment used fishery data from the period 1950-2019 and indices of relative abundance used in the assessment were calculated through 2019 (Figure 1, named "BET-Figure 3", TAC is represented by the red line).

The total annual Task I catch (Figure 1 "BET-Figure 3") increased continuously up to the mid1970s reaching 60,000 t and fluctuated over the next 15 years. In 1992, catch reached 100,000 t and continued to increase, reaching a historic high of about 135,000 t in 1994. Since then, reported and estimated catch continuously declined and fell to 59,192 t by 2006. From the low level of 2006, catches increased again and reached 79,524 t in 2015. Catches averaged 77,241 t in the period 2015-2019. The preliminary catch reported for 2020 was 57,486 t, below the TAC of 62,500 t.

Catches are presented below:
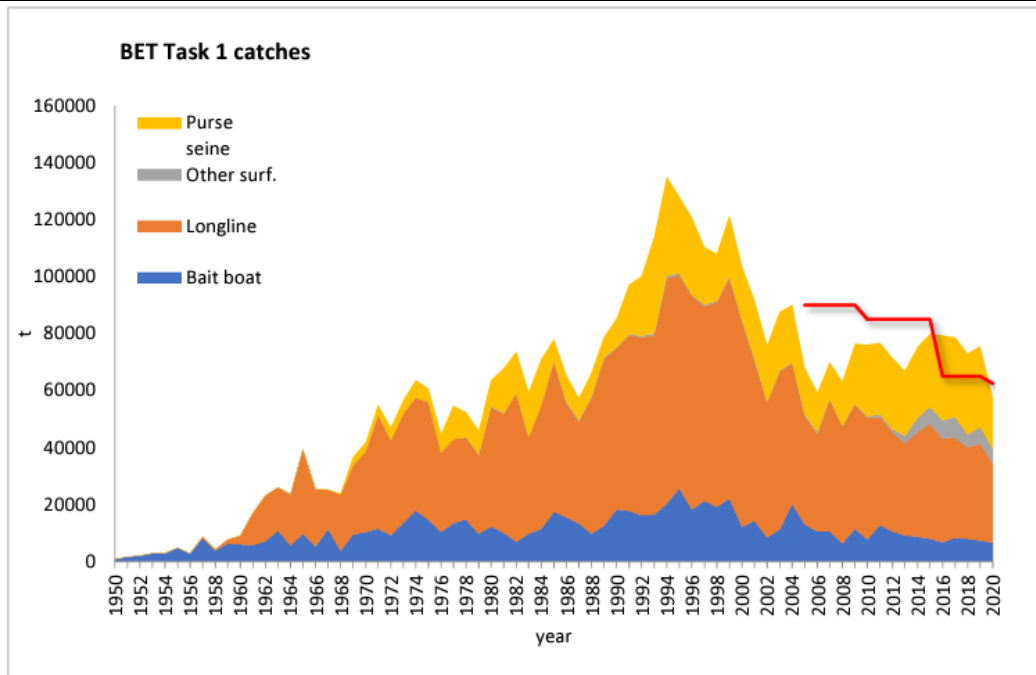
BET-Figure 3. Bigeye tuna estimated and reported catches for all the Atlantic stock (t). The value for 2020 represents catch reports until September 18, 2021.

Source: ICCAT, 2021b.

Therefore, fishery removals of the species in the fishery under assessment are included in the stock assessment process, so it PASSES Clause C1.1.
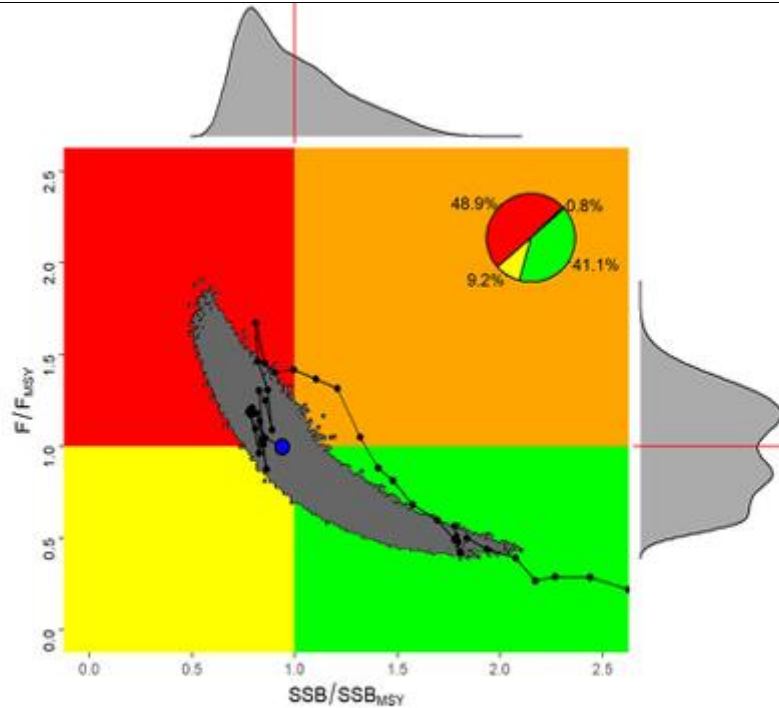
C1.2 The species is considered, in its most recent stock assessment, to have a biomass above the limit reference point (or proxy), OR removals by the fishery under assessment are considered by scientific authorities to be negligible.

The 2021 stock assessment was conducted using similar assessment models to those used in 2018, updating the data until 2019, but with some significant changes in natural mortality assumptions, derived from new information and new assumptions on maximum age, the relative abundance indices used and the fleet structure of the model used for providing management advice.

The Atlantic bigeye tuna stock in 2019 was estimated to be overfished but not undergoing overfishing. According to the Kobe strategy matrix, a future constant catch of 61,500 t, which is the TAC established in Rec. 19-02, will have a high probability (97%) of maintaining the stock in the green quadrant of the Kobe plot by 2034.

Furthermore, it needs to be noted that the estimated catches for 2020 and the assumed catches for 2021 (TAC= 61,500 t) result in a strong reduction of fishing mortality and a growth in SSB in those two first years of the projection period. This leads to a prediction that the BET stock at the end of 2021 will be in a significantly better status (probability of being in the green zone > 80%) than the stock at the end of the last year of the assessment in 2019 (probability of being in the green zone=41%). The rapid change in probabilities of overfishing and overfished during 2020 and 2021 are the result of the fact that estimated stock status is close to the centre point of the Kobe plot. When a stock is at such centre point, decreases in fishing mortality initially lead to large changes in these probabilities as can be seen from the marginal histograms (Figure 2, named "BET-Figure 8").

In this last stock assessment, Relative Spawning Biomass (SSB_{2019}/SSB_{MSY}) was set at 0.94 (0.71-1.37) and the stock status was estimated at 58% overfished. As shown in the Kobe plot below, the stock is slightly below limits and catches from the countries under assessment are not negligible.

BET-Figure 8. Stock Synthesis: Kobe plot of SSB/SSB$_{MSY}$ and F/F$_{MSY}$ for stock status of Atlantic bigeye tuna in 2019 based on the log multivariate normal approximation across the 27 uncertainty grid model runs of Stock Synthesis with an insert pie chart showing the probability of being in the red quadrant (48.9 %), green quadrant (41.1 %), orange (0.8%) and in yellow (9.2 %). Blue circle is the median and marginal histograms represent distribution of either SSB/SSB$_{MSY}$ or F/F$_{MSY}$.

Source: ICCAT 2021b

Therefore, the species is considered, in its most recent stock assessment, to have a biomass below the limit reference point (or proxy and removals are not negligible), so it FAILS Clause C1.2.

As per guidance, the stock is slightly below limits and catches from the countries under assessment are not negligible, so the fishery has been assessed under category D.

References	
ICAAT 2021a. REPORT OF THE 2021 ICCAT BIGEYE TUNA STOCK ASSESSMENT MEETING (Online, 19- 29 July 2021): https://www.iccat.int/Documents/SCRS/DetRep/BET_SA_ENG.pdf ICAAT 2021b. Summary of the REPORT OF THE 2021 ICCAT BIGEYE TUNA STOCK ASSESSMENT MEETING (Online, 19- 29 July 2021): https://iccat.int/Documents/SCRS/ExecSum/BET_ENG.pdf ICCAT stock assessments: https://iccat.int/en/assess.html	
Links	
MarinTrust Standard clause	1.3.2.2
FAO CCRF	7.5.3
GSSI	D.3.04, D5.01

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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.
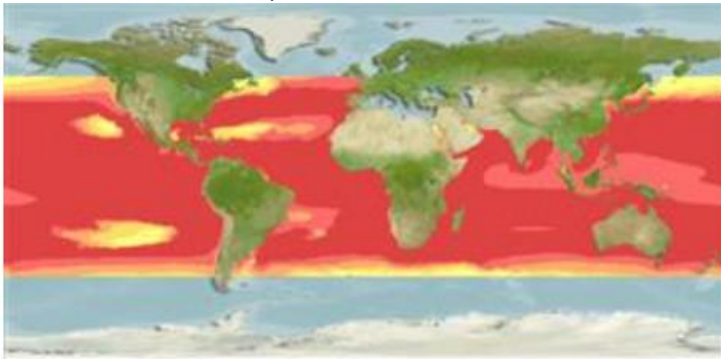
D1	**Species Name**	**Bigeye tuna** (*Thunnus obesus*)	
	Productivity Attribute	**Value**	**Score**
	Average age at maturity (years)	2.3	1
	Average maximum age (years)	11.6	2
	Fecundity (eggs/spawning)	4,274,342 [2,900,000-6,300,000]	1
	Average maximum size (cm)	200.1	2
	Average size at maturity (cm)	97.4	2
	Reproductive strategy	Broadcast spawner	1
	Mean trophic level	4.5	3
		Average Productivity Score	**1.71**
	Susceptibility Attribute	**Value**	**Score**
	Availability (area overlap)	More than 30% of the stock occurs in the area fished	3
	Encounterability (the position of the stock/species within the water column relative to the fishing gear)	Pelagic-oceanic, usually 0-500m	2
	Selectivity of gear type	Individuals < size at maturity are frequently caught and individuals < half size at maturity are retained by gear	3
	Post-capture mortality	Retained	3
		Average Susceptibility Score	**2.75**
		PSA Risk Rating (From Table D3)	**Pass**
		Compliance rating	**PASS**

Further justification for susceptibility scoring (where relevant)

The assessed fishery occurs in the FAO areas 34,41,47, which covers the half of the stock of Atlantic bigeye tuna, which has a global distribution for adult species:

This map was computer-generated and has not yet been reviewed.
Thunnus obesus   AquaMaps   Data sources: GBIF OBIS

References

Fishbase. *Thunnus obesus* (Lowe, 1839) Bigeye tuna:
https://www.fishbase.se/Summary/SpeciesSummary.php?ID=146&AT=bigeye

Standard clauses 1.3.2.2

Table D2 - Productivity / Susceptibility attributes and scores.

Productivity attributes	High productivity (Low risk, score = 1)	Medium productivity (medium risk, score = 2)	Low productivity (high risk, score = 3)
Average age at maturity	<5 years	5-15 years	>15 years
Average maximum age	<10 years	10-25 years	>25 years
Fecundity	>20,000 eggs per year	100-20,000 eggs per year	<100 eggs per year
Average maximum size	<100 cm	100-300 cm	>300 cm
Average size at maturity	<40 cm	40-200 cm	>200 cm
Reproductive strategy	Broadcast spawner	Demersal egg layer	Live bearer
Mean Trophic Level	<2.75	2.75-3.25	>3.25

Susceptibility attributes	Low susceptibility (Low risk, score = 1)	Medium susceptibility (medium risk, score = 2)	High susceptibility (high risk, score = 3)
Areal overlap (availability) Overlap of the fishing effort with the species range	<10% overlap	10-30% overlap	>30% overlap
Encounterability The position of the stock/species within the water column relative to the fishing gear, and the position of the stock/species within the habitat relative to the position of the gear	Low overlap with fishing gear (low encounterability).	Medium overlap with fishing gear.	High overlap with fishing gear (high encounterability). Default score for target species
Selectivity of gear type Potential of the gear to retain species	a Individuals < size at maturity are rarely caught	a Individuals < size at maturity are regularly caught.	a Individuals < size at maturity are frequently caught
	b Individuals < size at maturity can escape or avoid gear.	b Individuals < half the size at maturity can escape or avoid gear.	b Individuals < half the size at maturity are retained by gear.
Post-capture mortality (PCM) The chance that, if captured, a species would be released and that it would be in a condition permitting subsequent survival	Evidence of majority released post-capture and survival.	Evidence of some released post-capture and survival.	Retained species or majority dead when released.

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