# MarinTrust Standard V2

# By-product Fishery Assessment

## *SLV07 - Bigeye tuna in FAO area 51 (Western Indian Ocean)*

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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 area 51, Western Indian Ocean |
| | Country of origin of the product: | El Salvador, Ecuador, Spain, Panama |
| | Stock: | Indian Ocean bigeye tuna |
| Date | August 2024 | |
| Report Code | SLV07 | |
| Assessor | Jose Peiro Crespo | |
| Country of origin of the product - PASS | El Salvador, Ecuador, Spain, Panama | |
| Country of origin of the product - FAIL | None | |

| Application details and summary of the assessment outcome | | | |
|---|---|---|---|
| Company Name(s): Calvo Conservas El Salvador SA de CV | | | |
| Country: El Salvador | | | |
| Email address: | | Applicant Code: | |
| Certification Body Details | | | |
| Name of Certification Body: | | | |
| Assessor | Peer Reviewer | Assessment Days | Initial/Surveillance/ Re-approval |
| Jose Peiro Crespo | Sam Peacock | 0.2 | Re-approval |
| Assessment Period | Up to September 2025 | | |

| Scope Details | |
|---|---|
| Main Species | Bigeye tuna (*Thunnus obesus*) |
| Stock | Indian Ocean bigeye tuna |
| Fishery Location | FAO area 51, Western Indian Ocean |
| Management Authority (Country/ State) | Indian Ocean Tuna Commission (IOTC) |
| Gear Type(s) | Not provided |
| Outcome of Assessment | |
| Peer Review Evaluation | Agree with Assessor's recommendation |
| Recommendation | **Approve** |

# Table 2. Assessment Determination

| Assessment Determination |
| --- |
| Bigeye tuna (*Thunnus obesus*) has been categorised by the IUCN as Vulnerable, and does not appear in the CITES appendices. Therefore, it is eligible for approval for use as Marin Trust by-product raw material. The stock is managed using biomass-based limit reference points and has therefore been assessed under Category C.<br><br>The stock is managed and assessed by the Indian Ocean Tuna Commission (IOTC). The most recent stock assessment for bigeye tuna was conducted in 2022. Fishery removals of the species in the fishery under assessment are included in the stock assessment process. The most recent stock assessment indicated that the biomass of the stock was above the limit reference point (0.5*SBMSY). As a result, the fishery effectively **complies with clauses C1.1 and C1.2.**<br><br>Consequently, bigeye tuna (*Thunnus obesus*) caught in FAO area 51 is granted **approval** for the production of fishmeal and fish oil, adhering to the existing MarinTrust v2.3 by-products standard. |
| **Fishery Assessment Peer Review Comments** |
| The peer reviewer agrees that this stock is eligible for MarinTrust approval, and that it should be assessed under Category C. The assessor has demonstrated, with references, that the stock is subject to a regular stock assessment which incorporates fishery removals, and that stock biomass is currently above the limit reference point level. For these reasons, the peer reviewer agrees that this byproduct should be re-approved for use as a raw material. |
| **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] |
|---|---|---|---|---|---|---|
| Bigeye tuna | *Thunnus obesus* | Indian Ocean | IOTC | C | Vulnerable | 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** | | **Bigeye 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**.

Bigeye tuna in the Indian Ocean is subject to regular stock assessment by the Indian Ocean Tuna Commission (IOTC). The most recent stock assessment was carried out in 2022. Two models were applied to the bigeye stock (Statistical Catch at Size (SCAS) and Stock Synthesis (SS3)), with the SS3 stock assessment selected to provide scientific advice. The reported stock status is based on a grid of 24 model configurations designed to capture the uncertainty on stock recruitment relationship, longline selectivity, growth and natural mortality. The assessment incorporated catch data from several fisheries working in the Indian Ocean (see figure below) (IOTC 2023). The assessment includes all available catch data, ensuring that criterion **C1.1 is met**.

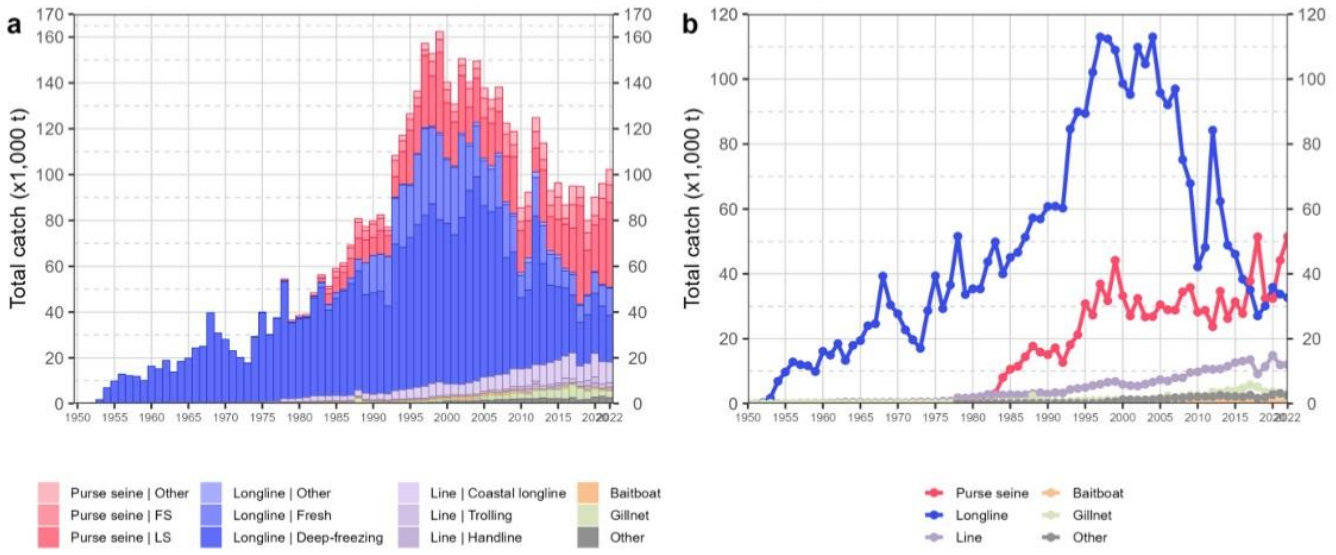


FIGURE 1 ANNUAL TIME SERIES OF (A) CUMULATIVE NOMINAL CATCHES (METRIC TONNES; T) BY FISHERY AND (B) INDIVIDUAL NOMINAL CATCHES (METRIC TONNES; T) BY FISHERY GROUP FOR BIGEYE TUNA DURING 1950-2022 (IOTC 2023)

**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 new stock assessment was carried out for bigeye tuna in 2023 and so the advice is based on the 2022 assessment. As indicated, in 2022 two models were applied to the bigeye stock (Statistical Catch at Size (SCAS) and Stock Synthesis (SS3)), with the SS3

stock assessment selected to provide scientific advice. The reported stock status was based on a grid of 24 model configurations designed to capture the uncertainty on stock recruitment relationship, longline selectivity, growth and natural mortality. Spawning biomass in 2021 was estimated to be 25% (80% CI: 23-27%) of the unfished levels and 90% (75-105%) of the level that can support MSY. Fishing mortality was estimated at 1.43 (1.1-1.77) times the FMSY level. Considering the characterized uncertainty, the assessment indicates that SB2021 is below SBMSY and that F2021 is above FMSY (79%). On the weight-of-evidence available in 2022, the bigeye tuna stock was determined **to be overfished and subject to overfishing.** However, for the MT purposes, the stock is considered to be over SBlim (0.5 SBMSY). Therefore, there is a very low probability of the biomass being below the limit reference point, and **C1.2 is met.**

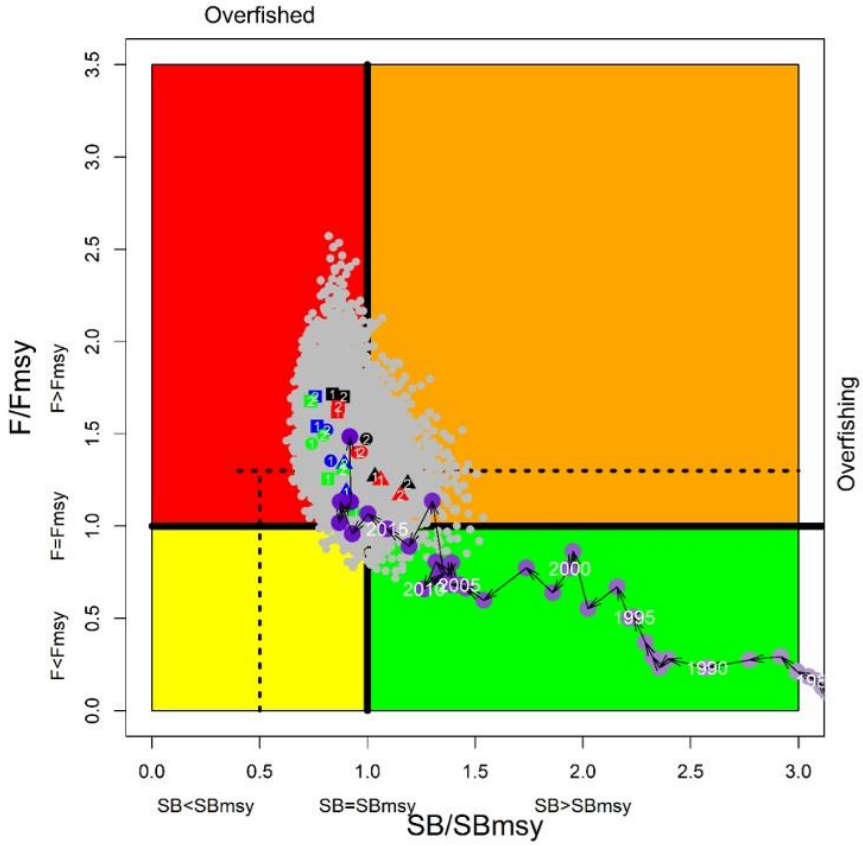


**FIGURE 2 BIGEYE TUNA: SS3 AGGREGATED INDIAN OCEAN ASSESSMENT KOBE PLOT. THE COLOURED POINTS REPRESENT STOCK STATUS ESTIMATES FROM THE 24 MODEL OPTIONS. COLOURED SYMBOLS REPRESENT MAXIMUM POSTERIOR DENSITY (MPD) ESTIMATES FROM INDIVIDUAL MODELS: SQUARE, CIRCLE, AND TRIANGLES REPRESENTS ALTERNATIVE STEEPNESS OPTIONS; BLACK, RED, BLUE, AND GREEN REPRESENTS ALTERNATIVE GROWTH AND NATURAL MORTALITY OPTION COMBINATION; 1,2, REPRESENTS ALTERNATIVE SELECTIVITY OPTIONS. THE PURPLE DOT AND ARROWED LINE REPRESENT ESTIMATES OF THE REFERENCE MODEL (THE LAST PURPLE DOT REPRESENTS THE TERMINAL YEAR OF 2021). GREY DOTS REPRESENT UNCERTAINTY FROM INDIVIDUAL MODELS. THE DASHED LINES REPRESENT LIMIT REFERENCE POINTS FOR IO BIGEYE TUNA (SBLIM = 0.5 SBMSY AND FLIM = 1.4 FMSY) (IOTC 2023).**

| Area[1] | Indicators | | 2022 stock status determination[4] |
|---|---|---|---|
| Indian Ocean | Catch 2022[2] (t)<br>Mean annual catch 2018-2022 (t)[3] | 102,266<br>92,687 | 79% |
| | MSY (1,000 t) (80% CI)<br>$F_{MSY}$ (80% CI)<br>$SB_{MSY}$ (1,000 t) (80% CI)<br>$F_{2021}/F_{MSY}$ (80% CI)<br>$SB_{2021}/B_{MSY}$ (80% CI) | 96 (83 – 108)<br>0.26 (0.18 – 0.34)<br>513 (332 – 694)<br>1.43 (1.10–1.77)<br>0.25 (0.23 – 0.27) | |

[1]Boundaries for the Indian Ocean stock assessment are defined as the IOTC area of competence
[2]Proportion of 2022 catch fully or partially estimated by IOTC Secretariat: 18.7%
[3]Including re-estimations of EU PS species composition for 2018 (only requested for stock assessment purposes)
[4]2021 is the final year that data were available for this assessment
*Estimated probability that the stock is in the respective quadrant of the Kobe Plot (**Table 2**), derived from the confidence intervals associated with the current stock status.

FIGURE 3 STATUS OF BIGEYE TUNA (THUNNUS OBESUS) IN THE INDIAN OCEAN (IOTC 2023)

**References**

IOTC (2023). Indian Ocean bigeye tuna stock status and advice. Executive summary. https://iotc.org/sites/default/files/content/Stock_status/2023/Bigeye_ES_2023.pdf

| 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)**<br>*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 | 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 |

| 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 |