

Scientist and fisheries managers to meet in Victoria, Seychelles to formulate recommendations relating to the management of tuna and tuna-like species in the Indian Ocean.

With the 25th session of the IOTC Scientific Committee taking place from the 5th to the 9th December 2022, at the Eden Blue Hotel, Victoria, Seychelles, scientists and fisheries managers are expected to focus on fine-tuning management advices for bigeye tuna. The recent stock assessment undertaken in 2022 at the 24th Session of the IOTC Working Party on Tropical Tunas (Virtual Meeting, 24 - 29 October 2022), determined that the bigeye tuna stock is overfished and subject to overfishing, i.e. being in the red quadrant of the KOBE plot, (figure 1 left). Bigeye tuna stock is now in the same situation to the yellowfin tuna stock, which has been in an overfished and subject to overfishing status since 2016. The yellowfin tuna stock assessment undertaken in 2021, determined the same status (figure 1 left).

Of the three tropical tuna species, only skipjack tuna is in the green (figure 1 right). For more details and for a copy of the report of the 24th session of the IOTC Working Party on Tropical Tuna, click on this link; <https://iotc.org/documents/WPTT/24/RE>

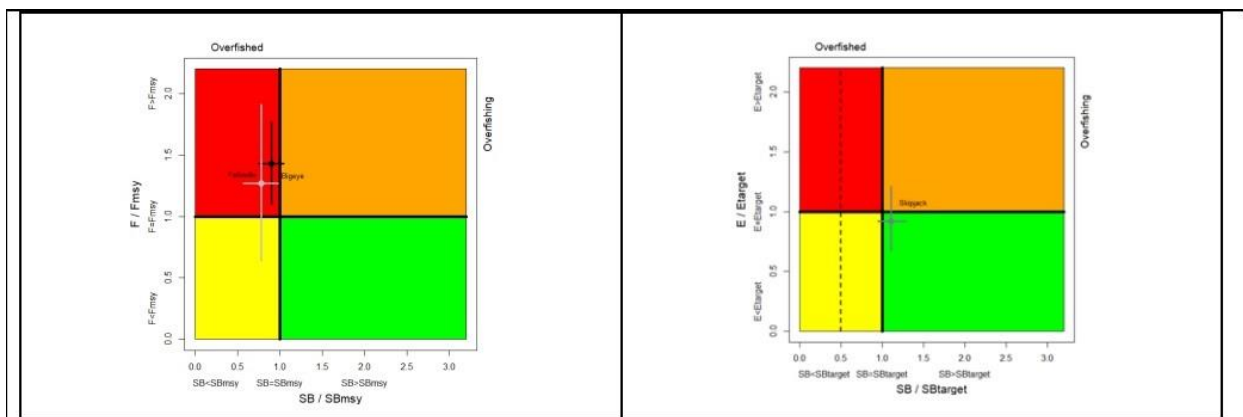


Figure 1. (Left) Combined Kobe plot for bigeye tuna (black: 2022), and yellowfin tuna (grey: 2021) showing the estimates of current stock size (SB) and current fishing mortality (F) in relation to optimal spawning stock size and optimal fishing mortality. (Right) Kobe plot for skipjack tuna showing the estimates of the current stock status (The dashed line indicates the limit reference point at 20%SB₀). Cross bars illustrate the range of uncertainty from the model runs with a 80% CI.

Stock summaries for tuna and tuna-like species which falls under the purview of the IOTC, as well as for other species taken in association with tuna fisheries, are presented in the below summaries. For further details, the report of the 24th session of the IOTC Scientific committee can be access via this link; <https://iotc.org/documents/SC/24/RE>.

Table 1. Status summary for species of tuna and tuna-like species under the IOTC mandate, as well as other species impacted by IOTC fisheries. (NOTE: the year column indicates the year the stock status was determined, not the terminal year of the assessment model)

Temperate and tropical tuna stocks: main stocks being targeted by industrial, and to a lesser extent, artisanal fisheries throughout the Indian Ocean, both on the high seas and in the EEZ of coastal states.

| Stock | Indicators | 2017 | 2018 | 2019 | 2020 | 2021 | Advice to the Commission |
|--|--|--|------|------|------|------|--|
| Albacore <i>Thunnus alalunga</i> | Catch 2020 Average catch 2016–2020 MSY (1000 t) (95% CI) F_{MSY} (95% CI) SB _{MSY} (1000 t) (95% CI) F_{2017}/F_{MSY} (95% CI) SB ₂₀₁₇ /SB _{MSY} (95% CI) SB ₂₀₁₇ /SB ₁₉₅₀ (95% CI) | 38,082 t 38,781 t 35.7 (27.3–44.4) 0.21 (0.195–0.237) 23.2 (17.6–29.2) 1.346 (0.588–2.171) 1.281 (0.574–2.071) 0.262 (-) | | | | | <p>A stock assessment was carried out for albacore in 2019 to update the assessment undertaken in 2016.</p> <p>Although considerable uncertainty remains in the SS3 assessment conducted in 2019, particularly due to the conflicts in key data inputs, a precautionary approach to the management of albacore tuna should be applied. The K2SM indicates that catch reductions are required in order to prevent the biomass from declining to below MSY levels in the short term, due to the low recent recruitment levels. Although there is considerable uncertainty in the projections, current catches are exceeding the estimated MSY level (35,700 t).</p> <p>The stock status in relation to the Commission's B_{MSY} and F_{MSY} target reference points indicates that the stock is not overfished but is subject to overfishing</p> <p>Click here for full stock status summary: Appendix 8</p> |
| Bigeye tuna <i>Thunnus obesus</i> | Catch in 2020 Average catch 2016–2020 MSY (1000 t) (80% CI) F_{MSY} (80% CI) SB _{MSY} (1,000 t) (80% CI) F_{2018}/F_{MSY} (80% CI) SB ₂₀₁₈ /SB _{MSY} (80% CI) SB ₂₀₁₈ /SB ₀ (80% CI) | 83,498 t 86,880 t 87 (75 – 108) 0.24 (0.18 – 0.36) 503 (370 – 748) 1.20 (0.70 – 2.05) 1.22 (0.82 – 1.81) 0.31 (0.21 – 0.34) | | | 38% | | <p>In 2019 a stock assessment was carried out for bigeye tuna in the IOTC area of competence to update the stock status undertaken in 2016.</p> <p>The stock status determination changed qualitatively in 2019 to not overfished but subject to overfishing. If catches remain at 2018 levels there is a risk of breaching MSY reference points with 58.9% and 60.8% probability in 2021 and 2028. Maintaining catches of at least 10% below 2018 levels will likely reduce the probabilities of breaching reference levels to 49.1% in 2028. Continued monitoring and improvement in data collection, reporting and analyses is required to reduce the uncertainty in assessments.</p> <p>Click here for full stock status summary: Appendix 9</p> |
| Skipjack tuna <i>Katsuwonus pelamis</i> | Catch in 2020 Average catch 2016–2020 C _{40%SB0} (t) (80% CI) C ₂₀₁₉ / C _{40%SB0} (80% CI) E _{40%SB0} (80% CI) E ₂₀₁₉ / E _{40%SB0} (80% CI) SB ₀ (t) (80% CI) | 555,211 t 546,095 t 535,964 (461,995–674,536) 1.02 (0.81–1.18) 0.59 (0.53–0.66) 0.92 (0.67–1.21) 1,992,089 (1,691,710–2,547,087) | | | | 60% | <p>A stock assessment was carried out for skipjack tuna in 2020 using Stock Synthesis with data up to 2019. On the weight-of-evidence available in 2020, the skipjack tuna stock is determined to be: (i) above the adopted biomass target reference point; (ii) not overfished (SB₂₀₁₉>SB_{40%SB0}); (iii) with fishing mortality below the adopted target fishing mortality, and; (iv) not subject to overfishing (E₂₀₁₉<E_{40%SB0}). The catch limit calculated applying the HCR specified in Resolution 16/02 is 513,572 t for the period 2021 -2023. The SC noted that this catch limit is higher than for the</p> |

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|---|---|--|-----|--|--|-----|---|
| | <p>SB₂₀₁₉ (t) (80% CI) 870,461 (660,411–1,253,181) SB_{40%SB0} (t) (80% CI) 794,310 (672,825–1,019,056) SB_{20%SB0} (t) (80% CI) 397,155 (336,412–509,528) SB₂₀₁₉ / SB₀ (80% CI) 0.45 (0.38-0.5) SB₂₀₁₉ / SB_{40%SB0} (80% CI) 1.11 (0.95-1.29) SB₂₀₁₉ / SB_{MSY} (80% CI) 1.99 (1.47-2.63) MSY (t) (80% CI) 601,088 (500,131–767,012) E₂₀₁₉ / E_{MSY} (80% CI) 0.48 (0.35-0.81)</p> | | | | | | <p>previous period notwithstanding regular overshooting of the previous established catch limit. This is attributed to the new stock assessment which estimates a higher productivity of the stock and a higher stock level relative to the target reference point, possibly due to skipjack life history characteristics and favourable environmental conditions. Thus, it is likely that the recent catches that have exceeded the limits established for the period 2018-2020 have been sustained by favourable environmental conditions. Therefore, the Commission needs to ensure that catches of skipjack tuna during this period (2021 – 2023) do not exceed the agreed limit.</p> <p>Click here for full stock status summary: Appendix 10</p> |
| <p>Yellowfin tuna <i>Thunnus albacares</i></p> | <p>Catch 2020 432,624 t Average catch 2016–2020 434,569 t MSY (1000 t) (80% CI) 349 (286–412) F_{MSY} (80% CI) 0.18 (0.15–0.21) SB_{MSY} (1,000 t) (80% CI) 1,333 (1,018–1,648) F₂₀₂₀/F_{MSY} (80% CI) 1.32 (0.68–1.95) SB₂₀₂₀/SB_{MSY} (80% CI) 0.87 (0.63–1.10) SB₂₀₂₀/SB₀ (80% CI) 0.31 (0.24 – 0.38)</p> | | 94% | | | 68% | <p>A new stock assessment was carried out for yellowfin tuna in 2021. On the weight-of-evidence available since 2018, the yellowfin tuna stock is determined to remain overfished and subject to overfishing</p> <p>It is noted that the estimated productivity of the stock (MSY) was very low for some of the scenarios of the reference grid. Their plausibility and reasons for this low productivity are yet to be fully investigated. It is noted that there is also considerable uncertainty in the reported catches by some fisheries. In particular, several artisanal fisheries have increased their catches substantially in recent years, the implication of which should be further investigated. There was a lack of information to explain this sharp increase in catch. A number of additional uncertainties were identified that require further exploration, including those related to growth, natural mortality and longline catchability. Inconsistencies in the biomass trend by region also remain unresolved and this deserves further investigation.</p> <p>According to the K2SM,</p> <ul style="list-style-type: none"> • if catches are reduced to 60% of 2020 levels¹ there is >50% probability of being above Bmsy levels by 2023. • if catches are reduced to < 80% of 2020 levels there is a >50% probability of being above BMSY in 2030. • if catches are reduced to less than 80% of 2020 levels there would be a >50% probability of ending overfishing (F<Fmsy) by 2023 and also by 2030. • The probability of breaching the biological limit reference point (0.4Bmsy) with 2020 catches is 7% by 2023 and 64% by 2030. The probability of breaching the F limit reference point (1.4 Fmsy) with 2020 catch is 52% by 2023 and 78% by 2030. |

¹ 2020 catch levels indicate the nominal catch available to the WPTT at its session in October 2021 (WPTT23).

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| | | | | | | | | <p>The Commission has an interim plan for the rebuilding the yellowfin stock, with catch limitations based on 2014/2015 levels (Resolution 21/01 which superseded 19/01, 18/01 and 17/01). Some of the fisheries subject to catch reductions have achieved a decrease in catches in 2020 in accordance with the levels of reductions specified in the Resolution; however, these reductions were offset by increases in the catches from CPCs exempt from and some CPCs subject to limitations on their catches of yellowfin tuna.</p> <p>Click here for full stock status summary: Appendix 11</p> |
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Billfish: The billfish stocks are exploited by industrial and artisanal fisheries throughout the Indian Ocean, both on the high seas and in the EEZ of coastal states. While marlins and sailfish are not usually targeted by most fleets, they are caught and retained as bycatch by the main industrial fisheries, and are also important for localised small-scale and artisanal fisheries or as targets in sports and recreational fisheries.

| Stock | Indicators | 2017 | 2018 | 2019 | 2020 | 2021 | Advice to the Commission | | | | |
|-------------------------------------|---|----------|----------|------------|------------------|------------|--------------------------|------------------|------------------|-----|--|
| Swordfish <i>Xiphias gladius</i> | Catch 2020 Average catch 2016-2020 MSY (1,000 t) (80% CI) F_{MSY} (80% CI) SB _{MSY} (1,000 t) (80% CI) F_{2018}/F_{MSY} (80% CI) SB _{2018}/SB_{MSY} (80% CI) SB_{2018}/SB₁₉₅₀ (80% CI)}} | 26,005 t | 30,858 t | 33 (27–40) | 0.23 (0.15–0.31) | 59 (41–77) | 0.60 (0.40–0.83) | 1.75 (1.28–2.35) | 0.42 (0.36–0.47) | 98% | <p>An assessment was undertaken in 2020 using stock synthesis with fisheries data up to 2018. On the weight-of-evidence available in 2020, the stock is determined to be not overfished and not subject to overfishing.</p> <p>The most recent catches (32,671 t in 2019) are at approximately the MSY level (33,000 t). Under the current levels of catches, the spawning biomass is projected to remain relatively stable, with a high probability of maintaining at or above the SBMSY for the longer term. Nevertheless, the Commission should consider limiting the catches so as not to exceed the 2018 catch level (30,847 t) to ensure that the probability of exceeding the SBMSY target reference points in the long term remains minimal (2%). Projections indicate that an increase of 40% or more from 2018 catch levels will likely result in the biomass dropping below the SBMSY level for the longer term (>75% probability). Taking into account the updated information regarding swordfish stock structure (IOTC-2020-WPB18-09), as well as the differential CPUE and biomass trends between regions, the WPB should continue to discuss the swordfish stock assessment model specifications and consider the feasibility of including a multi-stock assessment in 2023. Recognising that there is recurring evidence for localised depletion in the southern regions (particularly the South West) the WPB expresses concern and suggests this should continue to be monitored.</p> <p>Click here for full stock status summary: Appendix 12</p> |

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| Black marlin <i>Istiompax indica</i> | Catch 2020 Average catch 2016–2020 MSY (1,000 t) (95% CI) F _{MSY} (95% CI) B _{MSY} (1,000 t) (95% CI) F _{current} /F _{MSY} (95% CI) B _{current} /B _{MSY} (95% CI) B _{current} /B ₀ (95% CI) | 16,977 t 18,289 t 17.30 (11.00-35.02) 0.20 (0.12-0.34) 87.39 (53.82-167.70) 0.53 (0.22 – 1.05) 1.98 (1.42 – 2.57) 0.73 (0.53 – 0.95) | | | | | | <p>A stock assessment based on JABBA, a Bayesian state-space production model (age-aggregated), was conducted in 2021 for black marlin. Since 2018, there has been no discernable improvement in the data available for black marlin and the subsequent assessment outputs remain uncertain and should be interpreted with caution. As such, there is no reasonable justification to change the stock status from “Not assessed/Uncertain”.</p> <p>The 2020 catches (16,977 t) (Fig. 1) were substantially higher than the MSY limits stipulated in Res (18/05) which is 9,932 t. The Commission should provide mechanisms to ensure that catch limits are not exceeded by all concerned fisheries. Projections were not carried out due to the poor predictive capabilities identified in the assessment diagnostics.</p> <p>Click here for full stock status summary: Appendix 13</p> |
| Blue marlin <i>Makaira nigricans</i> | Catch 2020 Average catch 2016-2020 MSY (1,000 t) (80% CI) F _{MSY} (80% CI) B _{MSY} (1,000 t) (80% CI) H ₂₀₁₇ /H _{MSY} (80% CI) B ₂₀₁₇ /B _{MSY} (80% CI) B ₂₀₁₇ /B ₀ (80% CI) | 6,958 t 8,701 t 9.98 (8.18 –11.86) 0.21 (0.13 – 0.35) 47 (29.9 – 75.3) 1.47 (0.96 – 2.35) 0.82 (0.56 – 1.15) 0.41 (0.28 – 0.57) | | | 87% | | | <p>No new stock assessment for blue marlin was carried out in 2021 so the stock status is based on the 2019 assessment conducted using the Bayesian State-Space Surplus Production model JABBA, which suggests that there is an 87% probability that the Indian Ocean blue marlin stock in 2017 is in the red zone of the Kobe plot, indicating the stock is overfished and subject to overfishing.</p> <p>The current catches of blue marlin (average of 8,701 t in the last 5 years, 2016-2020) are lower than MSY (9,984 t). The assessment conducted in 2017 indicated that the stock was overfished and subject to overfishing. In order to achieve the Commission objectives of being in the green zone of the Kobe Plot by 2027 (F₂₀₂₇ < F_{MSY} and B₂₀₂₇ > B_{MSY}) with at least a 60% chance, the catches of blue marlin would have to be reduced by 35% compared to the average of the last 3 years, to a maximum value of approximately 7,800 t.</p> <p>Click here for full stock status summary: Appendix 14</p> |
| Striped marlin <i>Kajikia audax</i> | Catch 2020 Average catch 2016-2020 MSY (1,000 t) (JABBA) MSY (1,000 t) (SS3) F _{MSY} (JABBA) F _{MSY} (SS3) B _{MSY} (JABBA) SB _{MSY} (SS3) F _{current} /F _{MSY} (JABBA) F _{current} /F _{MSY} (SS3) B _{current} /B _{MSY} (JABBA) SB _{current} /SB _{MSY} (SS3) B _{current} /B ₀ (JABBA) | 2,587 t 3,292 t 4.60 (4.12 - 5.08)3 4.82 (4.48 - 5.16) 0.26 (0.20–0.33) 0.23 (0.23 - 0.23) 17.89 (14.34 - 23.11) 6.162 (6.343, 5.837) 2.04 (1.35 - 2.93) 3.93 (2.30 - 5.31) 0.32 (0.22 - 0.51) 0.47 (0.35 - 0.63) 0.12 (0.10 – 0.19) | | | 99% | | 100% | <p>In 2021 a stock assessment was conducted based on two different models: JABBA, a Bayesian state-space production model (age-aggregated); and SS3, an integrated model (age-structured). Both models were generally consistent with regards to stock status and confirmed the results from 2012, 2013, 2015, 2017 and 2018 assessments. On the weight-of-evidence available in 2021, the stock status of striped marlin is determined to be overfished and subject to overfishing.</p> <p>Current or increasing catches have a very high risk of further decline in the stock status. The current 2020 catches (2,587 t) are lower than MSY (4,601 t) but the stock has been overfished for more than a decade and is now in a highly depleted state. If the Commission wishes to recover the stock to the green quadrant of the Kobe plot with a probability</p> |

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| | SB _{current} /SB ₀ (SS3) | 0.06 (0.05 - 0.08) | | | | | | | <p>ranging from 60% to 90% by 2026 as per Resolution 18/05, it needs to provide mechanisms to ensure the maximum annual catches remain between 900 t – 1,500 t.</p> <p>Click here for full stock status summary: Appendix 15</p> |
| Indo-Pacific Sailfish <i>Istiophorus platypterus</i> | <p>Catch 2020</p> <p>Average catch 2016-2020</p> <p>MSY (1,000 t) (80% CI)</p> <p>F_{MSY} (80% CI)</p> <p>B_{MSY} (1,000 t) (80% CI)</p> <p>F₂₀₁₇/F_{MSY} (80% CI)</p> <p>B₂₀₁₇/B_{MSY} (80% CI)</p> <p>B₂₀₁₇/B₀ (80% CI)</p> | <p>26,890 t</p> <p>29,897 t</p> <p>23.9 (16.1 – 35.4)</p> <p>0.19 (0.14 - 0.24)</p> <p>129 (81–206)</p> <p>1.22 (1 – 2.22)</p> <p>1.14 (0.63 – 1.39)</p> <p>0.57 (0.31 – 0.70)</p> | | | | | | <p>No new stock assessment for Indo-Pacific sailfish was carried out in 2021, thus, the stock status is determined on the basis of the 2019 assessment using the C-MSY model. The data poor stock assessment techniques indicated that F was above F_{MSY} (F/F_{MSY}=1.22) and B is above B_{MSY} (B/B_{MSY}=1.14). However, both assessment models rely on catch data only, and the catch series is highly uncertain. In addition, aspects of the biology, productivity and fisheries for this species, combined with the data poor status on which to base a more formal assessment, are also a cause for concern. On the weight-of-evidence available in 2019, the stock status cannot be assessed and is determined to be uncertain.</p> <p>The catch limits as stipulated in Resolution 18/05 (25,000 t) have been exceeded. The Commission should provide mechanisms to ensure that catch limits are not exceeded by all concerned fisheries. Research emphasis on further developing possible CPUE indicators from gillnet fisheries, and further exploration of stock assessment approaches for data poor fisheries are warranted. Given the limited data being reported for coastal gillnet fisheries, and the importance of sports fisheries for this species, efforts must be made to rectify these information gaps. The lack of catch records in the Persian Gulf should also be examined to evaluate the degree of localised depletion in Indian Ocean coastal areas.</p> <p>Click here for full stock status summary: Appendix 16</p> | |

Neritic tunas and mackerel: These six species have become as important or more important as the three tropical tuna species (bigeye tuna, skipjack tuna and yellowfin tuna) to most IOTC coastal states. Neritic tunas and mackerels are caught primarily by coastal fisheries, including small-scale industrial and artisanal fisheries, and are almost always caught within the EEZs of coastal states. Historically, catches were often reported as aggregates of various species, making it difficult to obtain appropriate data for stock assessment analyses.

| Stock | Indicators | 2017 | 2018 | 2019 | 2020 | 2021 | Advice to the Commission |
|------------------------------------|--|----------|------|------|------|------|---|
| Bullet tuna <i>Auxis rochei</i> | <p>Catch 2020</p> <p>Average catch 2016–2020</p> | 32,251 t | | | | | A new assessment was carried out in 2021 using the data-limited techniques (CMSY and LB-SPR), however the catch data for bullet |

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|---|---|--|--|--|--|--|--|---|
| | <p>MSY (1,000 t) unknown F_{MSY} unknown B_{MSY} (1,000 t) unknown $F_{current}/F_{MSY}$ unknown $B_{current}/B_{MSY}$ unknown $B_{current}/B_0$ unknown</p> | | | | | | | <p>tuna are very uncertain given the high percentage of the catches that had to be estimated due to a range of reporting issues. The lack of data on which to base an assessment of the stock are a cause for concern. Stock status in relation to the Commission's BMSY and FMSY reference points remains unknown</p> <p>For assessed species of neritic tunas in Indian Ocean (longtail tuna, kawakawa and narrow barred Spanish mackerel), the MSY was estimated to have been reached between 2009 and 2011 and both FMSY and BMSY were breached thereafter. Therefore, in the absence of a stock assessment of bullet tuna a limit to the catches should be considered by the Commission, by ensuring that future catches do not exceed the average catches estimated between 2009 and 2011 (8,870 t). The reference period (2009-2011) was chosen based on the most recent assessments of those neritic species in the Indian Ocean for which an assessment is available under the assumption that also for bullet tuna MSY was reached between 2009 and 2011. This catch advice should be maintained until an assessment of bullet tuna is available. Considering that MSY-based reference points for assessed species can change over time, the stock should be closely monitored. Mechanisms need to be developed by the Commission to improve current statistics by encouraging CPCs to comply with their recording and reporting requirements, so as to better inform scientific advice</p> <p>Click here for a full stock status summary: Appendix 17</p> |
| <p>Frigate tuna <i>Auxis thazard</i></p> | <p>Catch 2020 98,875 t Average catch 2016–2020 98,017 t MSY (1,000 t) unknown F_{MSY} unknown B_{MSY} (1,000 t) unknown $F_{current}/F_{MSY}$ unknown $B_{current}/B_{MSY}$ unknown $B_{current}/B_0$ unknown</p> | | | | | | | <p>A new assessment was carried out in 2021 using the data-limited techniques (CMSY and LB-SPR), however the catch data for frigate tuna are very uncertain given the high percentage of the catches that had to be estimated due to a range of reporting issues. The lack of data on which to base an assessment of the stock are a cause for considerable concern. Stock status in relation to the Commission's BMSY and FMSY reference points remains unknown.</p> <p>For assessed species of neritic tunas in Indian Ocean (longtail tuna, kawakawa and narrow barred Spanish mackerel), the MSY was estimated to have been reached between 2009 and 2011 and both FMSY and BMSY were breached thereafter. Therefore, in the absence of a stock assessment of frigate tuna a limit to the catches should be considered by the Commission, by ensuring that future catches do not exceed the average catches estimated between 2009 and 2011 (94,921 t). The reference period (2009-2011) was chosen based on the most recent assessments of those neritic species in the Indian Ocean for which an assessment is available under the assumption that also for bullet tuna MSY was reached</p> |

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| | | | | | | | | between 2009 and 2011. This catch advice should be maintained until an assessment of frigate tuna is available. Considering that MSY-based reference points for assessed species can change over time, the stock should be closely monitored. Mechanisms need to be developed by the Commission to improve current statistics by encouraging CPCs to comply with their recording and reporting requirements, so as to better inform scientific advice. Click here for a full stock status summary: Appendix 18 |
| Kawakawa <i>Euthynnus affinis</i> | Catch 2020 Average catch 2016–2020 MSY (80% CI) F _{MSY} (80% CI) B _{MSY} (80% CI) F _{current} /F _{MSY} (80% CI) B _{current} /B _{MSY} (80% CI) | 143,211 t 151,150 t 148,825 (124,114 – 222,505) t 0.44 (0.21–0.82) 355,670 (192,080 – 764,530) t 0.98 (0.85–1.11) 1.13 (0.75–1.58) | | | | 50% | | No new stock assessment was conducted for kawakawa in 2021 and so the results are based on the assessment carried out in 2020 using data-limited assessment techniques. Based on the weight-of-evidence available, the kawakawa stock for the Indian Ocean is classified as not overfished and not subject to overfishing . However, the assessment models rely on catch data, which is considered to be highly uncertain. The catch in 2018 (173,367 t) was above the then estimated MSY (152,000 t). The available gillnet CPUE of kawakawa showed a somewhat increasing trend although the reliability of the index as abundance indices remains unknown. Despite the substantial uncertainties, the stock is probably very close to being fished at MSY levels and that higher catches may not be sustained in the longer term. A precautionary approach to management is recommended. Click here for a full stock status summary: Appendix 19 |
| Longtail tuna <i>Thunnus tonggol</i> | Catch 2020 Average catch 2016–2020 MSY (80% CI) F _{MSY} (80% CI) B _{MSY} (80% CI) F _{current} /F _{MSY} (80% CI) B _{current} /B _{MSY} (80% CI) | 132,529 t 133,584 t 128,750 (99,902 – 151,357) 0.32 (0.15 – 0.66) 395,460 (129,240 – 751,316) 1.52 (0.751 – 2.87) 0.69 (0.45 – 1.21) | 67% | | | 76% | | No new assessment was conducted for longtail tuna in 2021 and so the results are based on the assessment carried out in 2020 using the Optimised Catch-Only Method (OCOM). Based on the weight-of-evidence currently available, the stock is considered to be both overfished and subject to overfishing . The catch in 2018 (136,906 t) was just below the estimated MSY (140,000 t) but the exploitation rate has been increasing over the last few years, as a result of the declining abundance. Despite the substantial uncertainties, this suggests that the stock is very close to being fished at MSY levels and that higher catches may not be sustained. A precautionary approach to management is recommended. Click here for a full stock status summary: Appendix 20 |
| | Catch 2020 | 42,471 t | | | | | | |

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|--|--|---|------------|--|--|------------|------------|--|
| <p>Indo-Pacific king mackerel <i>Scomberomorus guttatus</i></p> | <p>Average catch 2016-2020 MSY (1,000 t) F_{MSY} B_{MSY} (1,000 t) $F_{current}/F_{MSY}$ $B_{current}/B_{MSY}$ $B_{current}/B_0$</p> | <p>44,870 t 46.9 (37.7–58.4) 0.74 (0.56–0.99) 63.2 (42–94) 0.90 (0.78–2.01) 1.03 (0.46–1.19) 0.51 (0.23–0.60)</p> | | | | | <p>35%</p> | <p>A new assessment was carried out in 2021 using the data-limited techniques (CMSY and LB-SPR). The catch-only model has provided a more defensible approach in addressing the uncertainty of key parameters and the currently available catch data for the Indo-Pacific king mackerel appear to be of sufficiently improved quality for conducting an assessment albeit still with some uncertainty. Based on the weight-of-evidence currently available, the stock is considered to be not overfished and not subject to overfishing.</p> <p>Reported catches of Indo-Pacific king mackerel in the Indian Ocean has increased considerably since the late 2000s with recent catches fluctuating around estimated MSY, although the catch in 2019 was below the estimated MSY. This suggests that the stock is very close to being fished at MSY levels and that higher catches may not be sustained despite the substantial uncertainty associated with the assessment, a precautionary approach to management is recommended.</p> <p>Click here for a full stock status summary: Appendix 21</p> |
| <p>Narrow-barred Spanish mackerel <i>Scomberomorus commerson</i></p> | <p>Catch 2020 Average catch 2016-2020 MSY (80% CI) F_{MSY} (80% CI) B_{MSY} (80% CI) $F_{current}/F_{MSY}$ (80% CI) $B_{current}/B_{MSY}$ (80% CI)</p> | <p>157,687 t 167,678 t 157,760 (132,140–187,190) 0.49 (0.25–0.87) 323,500 (196,260–592,530) 1.24 (0.65–2.13) 0.80 (0.54–1.27)</p> | <p>89%</p> | | | <p>73%</p> | | <p>No new assessment was conducted for narrow-barred Spanish mackerel in 2021 and so the results are based on the assessment carried out in 2020 using the Optimised Catch-Only Method (OCOM).</p> <p>Based on the weight-of-evidence available, the stock appears to be overfished and subject to overfishing.</p> <p>The catch in 2019 was just below the estimated MSY and the available Gillnet CPUE show a somewhat increasing trend in recent years although the reliability of the Index as abundance indices remains unknown. Despite the substantial uncertainties, the stock is probably very close to being fished at MSY levels and that higher catches may not be sustained.</p> <p>Click here for a full stock status summary: Appendix 22</p> |

Sharks: Although sharks are not part of the 16 species directly under the IOTC mandate, sharks are frequently caught in association with fisheries targeting IOTC species. Some fleets are known to actively target both sharks and IOTC species simultaneously. As such, IOTC Contracting Parties and Cooperating Non-Contracting Parties are required to report information at the same level of detail as for the 16 IOTC species. The following are the main species caught in IOTC fisheries, although the list is not exhaustive.

| Stock | Indicators | | 2017 | 2018 | 2019 | 2020 | 2021 | Advice to the Commission |
|--|--|---------------------|-------|------|------|------|-------|---|
| Blue shark <i>Prionace glauca</i> | Reported catch 2020 | 21,344 t | 72.6% | | | | 99.9% | A new stock assessment for blue sharks was carried out in 2021 using an integrated age-structured model (SS3). |
| | Estimated catch 2019 | 43,240 t | | | | | | |
| | Not elsewhere included (nei) sharks 2020 | 20,552 t | | | | | | |
| | Average reported catch 2016–20 | 25,144 t | | | | | | |
| | Average estimated catch 2015–19 | 48,781 t | | | | | | |
| | Ave. (nei) sharks 2016–20 | 30,277 t | | | | | | |
| | MSY (1,000 t) (80% CI) | 36.0 (33.5 - 38.6) | | | | | | |
| | F _{MSY} (80% CI) | 0.31 (0.306 - 0.31) | | | | | | |
| | SB _{MSY} (1,000 t) (80% CI) | 42.0 (38.9 - 45.1) | | | | | | |
| | F ₂₀₁₉ /F _{MSY} (80% CI) | 0.64 (0.53 - 0.75) | | | | | | |
| | SB ₂₀₁₉ /SB _{MSY} (80% CI) | 1.39 (1.27 - 1.49) | | | | | | |
| | SB ₂₀₁₉ /SB ₀ (80% CI) | 0.46 (0.42 - 0.49) | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| Oceanic whitetip shark <i>Carcharhinus longimanus</i> | Reported catch 2020 | 30 t | | | | | | There is a paucity of information available for these species and this situation is not expected to improve in the short to medium term. There is no quantitative stock assessment and limited basic fishery indicators currently available. Therefore, the stock status is highly uncertain. The available evidence indicates considerable risk to the stock status at current effort levels. The primary source of data that drive the assessment (total catches) is highly uncertain and should be investigated further as a priority. |
| | Not elsewhere included (nei) sharks | 20,552 t | | | | | | |
| | Average reported catch 2016–2020 | 129 t | | | | | | |
| | Ave. (nei) sharks 2016–20 | 30,277 t | | | | | | |
| Scalloped hammerhead shark <i>Sphyrna lewini</i> | Reported catch 2020 | 38 t | | | | | | Click below for a full stock status summary: |
| | Not elsewhere included (nei) sharks | 20,552 t | | | | | | Oceanic whitetip sharks – Appendix 24 |
| | Average reported catch 2016–2020 | 67 t | | | | | | Scalloped hammerhead sharks – Appendix 25 |
| | Ave. (nei) sharks 2016–20 | 30,277 t | | | | | | Shortfin mako sharks – Appendix 26 |
| Shortfin mako <i>Isurus oxyrinchus</i> | Reported catch 2020 | 854 t | | | | | | |
| | Not elsewhere included (nei) sharks | 20,552 t | | | | | | |
| | Average reported catch 2016–2020 | 1,613 t | | | | | | |

| | | | | | | | | | |
|---|---|--|--|--|--|--|--|--|--|
| | Ave. (nei) sharks 2016–20 | 30,277 t | | | | | | | Silky sharks– Appendix 27 Bigeye thresher sharks– Appendix 28 Pelagic thresher sharks– Appendix 29 |
| Silky shark <i>Carcharhinus falciformis</i> | Reported catch 2020 Not elsewhere included (nei) sharks Average reported catch 2016–2020 Ave. (nei) sharks 2016–20 | 1,314 t 20,552 t 1,833 t 30,277 t | | | | | | | |
| Bigeye thresher shark <i>Alopias superciliosus</i> | Reported catch 2020 Not elsewhere included (nei) sharks Average reported catch 2016–2020 Ave. (nei) sharks 2016–20 | <1 t 20,552 t <1 t 30,277 t | | | | | | | |
| Pelagic thresher shark <i>Alopias pelagicus</i> | Reported catch 2020 Not elsewhere included (nei) sharks Average reported catch 2016–2020 Ave. (nei) sharks 2016–20 | 176 t 20,552 t 310 t 30,277 t | | | | | | | |

*Estimated probability that the stock is in the respective quadrant of the Kobe plot (shown below), derived from the confidence intervals associated with the current stock status.

| Colour key | Stock overfished ($SB_{year}/SB_{MSY} < 1$) | Stock not overfished ($SB_{year}/SB_{MSY} \geq 1$) |
|--|---|--|
| Stock subject to overfishing ($F_{year}/F_{MSY} > 1$) | | |
| Stock not subject to overfishing ($F_{year}/F_{MSY} \leq 1$) | | |
| Not assessed/Uncertain | | |

For a copy of the Seychelles National Report, produced for the upcoming 25th Scientific Committee meeting of the IOTC, click on this link; <https://iotc.org/documents/SC/25/NR22E>