

**2019. STATUS SUMMARY FOR SPECIES OF TUNA AND TUNA-LIKE SPECIES UNDER THE IOTC MANDATE, AS WELL AS OTHER SPECIES IMPACTED BY IOTC FISHERIES.**

**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	2015	2016	2017	2018	2019	Advice to the Commission
Albacore <i>Thunnus alalunga</i>	Catch 2018: 41,603 t Average catch 2014–2018: 38,030 t MSY (1000 t) (95% CI): 35.7 (27.3–44.4) F <sub>MSY</sub> (95% CI): 0.21 (0.195–0.237) SB <sub>MSY</sub> (1000 t) (95% CI): 23.2 (17.6–29.2) F <sub>2017</sub> /F <sub>MSY</sub> (95% CI): 1.346 (0.588–2.171) SB <sub>2017</sub> /SB <sub>MSY</sub> (95% CI): 1.281 (0.574–2.071) SB <sub>2017</sub> /SB <sub>1950</sub> (95% CI): 0.262 (-)						A new stock assessment was carried out for albacore in 2019 to update the assessment undertaken in 2016.  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).  The stock status in relation to the Commission’s BMSY and FMSY target reference points indicates that the stock is <b>not overfished</b> but is <b>subject to overfishing</b>  Click here for full stock status summary: <a href="#">Appendix 8</a>
Bigeye tuna <i>Thunnus obesus</i>	Catch in 2018: 93,515 t (81,413 t <sup>1</sup> ) Average catch 2014–2018: 92,140 t (89,720 t <sup>1</sup> ) MSY (1000 t) (80% CI): 87 (75 – 108) F <sub>MSY</sub> (80% CI): 0.24 (0.18 – 0.36) SB <sub>MSY</sub> (1,000 t) (80% CI): 503 (370 – 748) F <sub>2018</sub> /F <sub>MSY</sub> (80% CI): 1.20 (0.70 – 2.05) SB <sub>2018</sub> /SB <sub>MSY</sub> (80% CI): 1.22 (0.82 – 1.81) SB <sub>2018</sub> /SB <sub>0</sub> (80% CI): 0.31 (0.21 – 0.34)		84%			38%	In 2019 a new stock assessment was carried out for bigeye tuna in the IOTC area of competence to update the stock status undertaken in 2016.  The stock status determination changed qualitatively in 2019 to <b>not overfished</b> but <b>subject to overfishing</b> . If catches remain at current levels there is a risk of breaching MSY reference points with 58.9% and 60.8% probability in 2021 and 2028. Reduced catches of at least 10% from current 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.  Click here for full stock status summary: <a href="#">Appendix 9</a>
Skipjack tuna <i>Katsuwonus pelamis</i>	Catch in 2018: 607,701 t (606,197 t <sup>1</sup> ) Average catch 2014–2018: 484,993 t (484,692 t <sup>1</sup> ) Yield <sub>40%SSB</sub> (1000 t) (80% CI): 510.1 (455.9–618.8) C <sub>2016</sub> /C <sub>40%SSB</sub> (80% CI): 0.88 (0.72–0.98) SB <sub>2016</sub> (1000 t) (80% CI): 796.66 (582.65–1,059.29) Total Biomass B <sub>2016</sub> (1000 t) (80% CI): 910.4 (873.6–1195)		47%				No new stock assessment was carried out for skipjack tuna in 2019, thus, stock status is determined on the basis of the 2016 assessment and other indicators presented in 2019. On the weight-of-evidence available in 2019, the skipjack tuna stock is determined to be <b>not overfished</b> and is <b>not subject to overfishing</b> . Based on the results of the stock assessment of skipjack tuna in 2017, the Commission, following Resolution 16/02, adopted an annual catch limit of 470,029 tonnes for the years 2018 to

<sup>1</sup> Considering the alternative purse seine log-associated catch composition for the EU fleet in 2018 as per IOTC-2019-WPTT21-R[E]

	$SB_{2016}/SB_{40\%SSB}$ (80% CI): 0.40 (0.35–0.47) $SB_{2016}/SB_0$ (80% CI): 0.59 (0.53–0.65) $E^3_{40\%SSB}$ (80% CI): 2,015,220 (1,651,230–2,296,135) $SB_0$ (80% CI): 2,296,135						<p>2020. Total catches in 2018 (607,701 t) were 29% larger than the catch limit generated by the Harvest Control Rule (470,029 t) which applies to the years 2018–2020, and there has been an increasing trend in catches over the past 3 years. The Commission needs to ensure that future catches of skipjack do not exceed the agreed limit for the 2018-2020 period.</p> <p>Click here for full stock status summary: <a href="#">Appendix 10</a></p>
Yellowfin tuna <i>Thunnus albacares</i>	Catch 2018: 423,815 t (437,422 t <sup>2</sup> ) Average catch 2014–2018: 404,655 t (407,377 t <sup>2</sup> ) MSY (1000 t) (80% CI): 403 (339–436) FMSY (80% CI): 0.15 (0.13–0.17) SBMSY (1,000 t) (80% CI): 1069 (789–1387) F2017/FMSY (80% CI): 1.20 (1.00–1.71) SB2017/SBMSY (80% CI): 0.83 (0.74–0.97) SB2017/SB0 (80% CI): 0.30 (0.27 – 0.33)	94%	68%		94%		<p>No new stock assessment was carried out for yellowfin tuna in 2019, thus, stock status is determined on the basis of the 2018 assessment and other indicators presented in 2019. On the weight-of-evidence available in 2018 and 2019, the yellowfin tuna stock is determined to remain <b>overfished</b> and <b>subject to overfishing</b>.</p> <p>The decline in stock status to below MSY reference level is not well understood due to various uncertainties. As a precautionary measure, the Commission should ensure that catches are reduced to end overfishing and allow the SSB to recover to SBMSY levels. At this stage, no revised specific catch limits are recommended.</p> <p>In the 2018 Scientific Committee a Workplan was developed to address the issues identified in the assessment review, aimed at increasing the Committee’s ability to provide more concrete and robust advice by the 2019 meeting of the Scientific Committee. The workplan started in January 2019 which aimed at addressing the issues identified by the WPTT and the external reviewer in 2018. The draft workplan is attached as Appendix 38 of the 2018 Scientific Committee Report (IOTC-2018-SC21-R). The Commission should ensure that this workplan is budgeted appropriately. Despite the progress made to reduce the uncertainties inherent to this fishery, the WPTT agreed that no new advice could be provided in 2019.</p> <p>The Commission has an interim plan for the rebuilding the yellowfin stock, with catch limitations based on 2014/2015 levels (Resolution 19/01, which superseded 17/01 and 18/01). Some of the fisheries subject to catch reductions had fully achieved a decrease in catches in 2018 in accordance with the levels of reductions specified in the Resolution; however, these reductions were offset by increases in the catches from CPCs exempt and some CPCs subject to limitations on their catches of yellowfin tuna (see table 9 in IOTC-2019-WPTT21-R). Thus, the total catches of yellowfin in 2018 increased by around 9% from 2014/2015 levels. The Commission should ensure that any revision of the management measure can effectively achieve any prescribed catch reduction to ensure the effectiveness of the management measure.</p>

<sup>2</sup> Considering the alternative purse seine log-associated catches for the EU fleet in 2018 as per IOTC-2019-WPTT21-R

**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 byproduct 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	2015	2016	2017	2018	2019	Advice to the Scientific Committee
Swordfish <i>Xiphias gladius</i>	Catch 2018: 31,628 t Average catch 2014-2018: 31,343 t MSY (1,000 t) (80% CI): 31.59 (26.30-45.50) F <sub>MSY</sub> (80% CI): 0.17 (0.12-0.23) SB <sub>MSY</sub> (1,000 t) (80% CI): 43.69 (25.27-67.92) F <sub>2015</sub> /F <sub>MSY</sub> (80% CI): 0.76 (0.41-1.04) SB <sub>2015</sub> /SB <sub>MSY</sub> (80% CI): 1.50 (1.05-2.45) SB <sub>2015</sub> /SB <sub>1950</sub> (80% CI): 0.31 (0.26-0.43)						<p>No new stock assessment was carried out for swordfish in 2019, thus, the stock status is determined on the basis of the 2017 assessment and other indicators presented in 2019.</p> <p>On the weight-of-evidence available in 2019, the stock is determined to be <b>not overfished</b> and <b>not subject to overfishing</b>.</p> <p>The most recent catches (33,352 t in 2017) are higher than MSY (31,590 t) and should be reduced to the MSY level.</p> <p>Click here for full stock status summary: <a href="#">Appendix 12</a></p>
Black marlin <i>Makaira indica</i>	Catch 2018: 18,180 t Average catch 2014-2018: 18,074 t MSY (1,000 t) (80% CI): 12.93 (9.44-18.20) F <sub>MSY</sub> (80% CI): 0.18 (0.11-0.30) B <sub>MSY</sub> (1,000 t) (80% CI): 72.66 (45.52-119.47) F <sub>2017</sub> /F <sub>MSY</sub> (80% CI): 0.96 (0.77-1.12) B <sub>2017</sub> /B <sub>MSY</sub> (80% CI): 1.68 (1.32-2.10) B <sub>2017</sub> /B <sub>0</sub> (80% CI): 0.62 (0.49-0.78)						<p>No new stock assessment for black marlin was carried out in 2019, thus, the stock status is determined on the basis of the 2018 assessment based on JABBA and other indicators presented in 2019. The Kobe plot from the JABBA model indicated that the stock is <b>not subject to overfishing</b> and is currently <b>not overfished</b>, however these status estimates are subject to a high degree of uncertainty.</p> <p>Current catches (&gt;14,600 t in 2017) are higher than MSY estimate (12,930 t), which is likely to associate with high uncertainty. The catch limits as stipulated in Resolution 18/05 have also been exceeded. 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: <a href="#">Appendix 13</a></p>

<p>Blue marlin <i>Makaira nigricans</i></p>	<p>Catch 2018: 9,969 t Average catch 2014-2018: 11,382 t MSY (1,000 t) (80% CI): 9.98 (8.18 –11.86) F<sub>MSY</sub> (80% CI): 0.21 (0.13 – 0.35) B<sub>MSY</sub> (1,000 t) (80% CI): 47 (29.9 – 75.3) H<sub>2017</sub>/H<sub>MSY</sub> (80% CI): 1.47 (0.96 – 2.35) B<sub>2017</sub>/B<sub>MSY</sub> (80% CI): 0.82 (0.56 – 1.15) B<sub>2017</sub>/B<sub>0</sub> (80% CI): 0.41 (0.28 – 0.57)</p>					87%	<p>Stock status based on the Bayesian State-Space Surplus Production model JABBA 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 <b>overfished</b> and <b>subject to overfishing</b>.</p> <p>The current catches of blue marlin (average of 11,761 t in the last 5 years, 2013-2017) are higher than MSY (9,984 t) and the stock is currently overfished and subject to overfishing. In order to achieve the Commission objectives of being in the green zone of the Kobe Plot by 2027 (F<sub>2027</sub> &lt; F<sub>MSY</sub> and B<sub>2027</sub> &gt; B<sub>MSY</sub>) 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: <a href="#">Appendix 14</a></p>
<p>Striped marlin <i>Tetrapturus audax</i></p>	<p>Catch 2018: 2,791 t Average catch 2014-2018: 3,247 t MSY (1,000 t) (JABBA): 4.73 (4.27–5.18) F<sub>MSY</sub> (JABBA): 0.26 (0.20–0.34) B<sub>MSY</sub> (1,000 t) (JABBA): 17.94 (14.21–23.13) F<sub>2017</sub>/F<sub>MSY</sub> (JABBA): 1.99 (1.21–3.62) B<sub>2017</sub>/B<sub>MSY</sub> (JABBA): 0.33 (0.18–0.54) SB<sub>2017</sub>/SB<sub>MSY</sub> (SS3): 0.373 B<sub>2017</sub>/K(JABBA): 0.12 (0.07–0.20) SB<sub>2017</sub>/SB<sub>1950</sub> (SS3): 0.13 (0.09–0.14)</p>					99%	<p>No new stock assessment for striped marlin was carried out in 2019, thus, the stock status is determined on the basis of the 2018 assessment and other indicators presented in 2019. On the weight-of-evidence available in 2019, the stock status of striped marlin is determined to be <b>overfished</b> and <b>subject to overfishing</b>.</p> <p>Current or increasing catches have a very high risk of further decline in the stock status. Current 2017 catches are lower than MSY (4,730 t) but the stock has been overfished for more than two decades 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 ranging from 60% to 90% by 2026, it needs to provide mechanisms to ensure the maximum annual catches remain between 1,500 t – 2,200 t.</p> <p>Click here for full stock status summary: <a href="#">Appendix 15</a></p>
<p>Indo-Pacific Sailfish <i>Istiophorus platypterus</i></p>	<p>Catch 2018: 36,911 t Average catch 2014-2018: 31,267 t MSY (1,000 t) (80% CI): 23.9 (16.1 – 35.4) F<sub>MSY</sub> (80% CI): 0.19 (0.14 - 0.24) B<sub>MSY</sub> (1,000 t) (80% CI): 129 (81–206) F<sub>2017</sub>/F<sub>MSY</sub> (80% CI): 1.22 (1 – 2.22) B<sub>2017</sub>/B<sub>MSY</sub> (80% CI): 1.14 (0.63 – 1.39) B<sub>2017</sub>/B<sub>0</sub> (80% CI): 0.57 (0.31 – 0.70)</p>						<p>A new stock assessment was carried out for Indo-Pacific sailfish in 2019 using the C-MSY model. The data poor stock assessment techniques indicated that F was above F<sub>MSY</sub> (F/F<sub>MSY</sub>=1.22) and B above B<sub>MSY</sub> (B/B<sub>MSY</sub>=1.14). On the weight-of-evidence available in 2019, the stock status <b>cannot be assessed</b> and is determined to be uncertain.</p> <p>The catch limits as stipulated in Resolution 18/05 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</p>

								evaluate the degree of localised depletion in Indian Ocean coastal areas. Click here for full stock status summary: <a href="#">Appendix 16</a>
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**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		2015	2016	2017	2018	2019	Advice to the Commission
Bullet tuna <i>Auxis rochei</i>	Catch 2018:	31,615 t						<p>No quantitative stock assessment is currently available for bullet tuna in the Indian Ocean, and due to a lack of fishery data for several gears, only preliminary stock status indicators can be used. Stock status in relation to the Commission's BMSY and FMSY reference points remains <b>unknown</b></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: <a href="#">Appendix 17</a></p>
	Average catch 2014–2018:	16,364 t						
	MSY (1,000 t)	unknown						
	F <sub>MSY</sub> :	unknown						
	B <sub>MSY</sub> (1,000 t):	unknown						
	F <sub>current</sub> /F <sub>MSY</sub> :	unknown						
	B <sub>current</sub> /B <sub>MSY</sub> :	unknown						
	B <sub>current</sub> /B <sub>0</sub> :	unknown						
Frigate tuna <i>Auxis thazard</i>	Catch 2018:	82,909 t						<p>No quantitative stock assessment is currently available for frigate tuna in the Indian Ocean, and due to a lack of fishery data for</p>
	Average catch 2014–2018:	89,253 t						

Stock	Indicators		2015	2016	2017	2018	2019	Advice to the Commission
	MSY (1,000 t) $F_{MSY}$ : $B_{MSY}$ (1,000 t): $F_{current}/F_{MSY}$ : $B_{current}/B_{MSY}$ : $B_{current}/B_0$ :	unknown unknown unknown unknown unknown						<p>several gears, only preliminary stock status indicators can be used. Stock status in relation to the Commission's BMSY and FMSY reference points remains <b>unknown</b>.</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 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.</p> <p>Click here for a full stock status summary: <a href="#">Appendix 18</a></p>
Kawakawa <i>Euthynnus affinis</i>	Catch 2018: Average catch 2014-2018 MSY (1,000 t) [*] $F_{MSY}$ [*] $B_{MSY}$ (1,000 t) [*] $F_{2013}/F_{MSY}$ [*] $B_{2013}/B_{MSY}$ [*] $B_{2013}/B_0$ [*]	173,367 t 161,844 t 152 [125–188] 0.56 [0.42–0.69] 202 [151–315] 0.98 [0.85–1.11] 1.15 [0.97–1.38] 0.58 [0.33–0.86]						<p>A stock assessment was not undertaken for kawakawa in 2019 and the status is determined on the basis of the last assessment conducted in 2015, which used catch data from 1950 to 2013.</p> <p>Based on the weight-of-evidence available, the kawakawa stock for the Indian Ocean is classified as <b>not overfished and not subject to overfishing</b>.</p> <p>Although the stock status is classified as not overfished and not subject to overfishing, the Kobe strategy II matrix developed in 2015 showed that there is a 96% probability that biomass is below MSY levels and 100% probability that <math>F &gt; F_{MSY}</math> by 2016 and 2023 if catches are maintained at the 2013 levels. There is a 55% probability that biomass is below MSY levels and 91% probability that <math>F &gt; F_{MSY}</math> by 2023 if catches are maintained at around 2016 levels. The modelled probabilities of the stock achieving levels consistent with the MSY reference points (e.g. <math>S_B &gt; S_{BMSY}</math> and <math>F &lt; F_{MSY}</math>) in 2023 are 100% for a future constant catch at 80% of 2013 catch levels. If catches are reduced by 20% based on 2013 levels at the time of the assessment (170,181 t), the stock is</p>

Stock	Indicators		2015	2016	2017	2018	2019	Advice to the Commission
								<p>expected to recover to levels above MSY reference points with a 50% probability by 2023.</p> <p>Click here for a full stock status summary: <a href="#">Appendix 19</a></p>
Longtail tuna <i>Thunnus tonggol</i>	Catch 2018: Average catch 2014–2018: MSY (1,000 t) (*): $F_{MSY}$ (*): $B_{MSY}$ (1,000 t) (*): $F_{2015}/F_{MSY}$ (*): $B_{2015}/B_{MSY}$ (*): $B_{2015}/B_0$ (*):	136,906 t 138,352 t 140 (103–184) 0.43 (0.28–0.69) 319 (200–623) 1.04 (0.84–1.46) 0.94 (0.68–1.16) 0.48 (0.34–0.59)			67%			<p>No new stock assessment for Longtail tuna was carried out in 2019, thus, the stock status is determined on the basis of the 2017 assessment and other indicators presented in 2019.</p> <p>Based on the weight-of-evidence currently available, the stock is considered to be both <b>overfished</b> and <b>subject to overfishing</b>.</p> <p>There is a substantial risk of exceeding MSY-based reference points by 2018 if catches are maintained at current (2015) levels (63% risk that <math>B_{2018} &lt; B_{MSY}</math>, and 55% risk that <math>F_{2018} &gt; F_{MSY}</math>). If catches are reduced by 10% this risk is lowered to 33% probability <math>B_{2018} &lt; B_{MSY}</math> and 28% probability <math>F_{2018} &gt; F_{MSY}</math>. If catches are capped at current (2015) levels at the time of the assessment (i.e., 136,849 t), the stock is expected to recover to levels above MSY reference points with at least a 50% probability by 2025. Catches have remained below estimated MSY since 2015.</p> <p>Click here for a full stock status summary: <a href="#">Appendix 20</a></p>
Indo-Pacific king mackerel <i>Scomberomorus guttatus</i>	Catch 2018: Average catch 2014–2018: MSY (1,000 t) $F_{MSY}$ : $B_{MSY}$ (1,000 t): $F_{current}/F_{MSY}$ : $B_{current}/B_{MSY}$ : $B_{current}/B_0$ :	50,653 t 49,511 t Unknown Unknown Unknown Unknown Unknown Unknown						<p>No new stock assessment for Indo-Pacific king mackerel was carried out in 2019, thus, the stock status is determined on the basis of the 2016 assessment and other indicators presented in 2019.</p> <p>Given that no new assessment was undertaken in 2019, the WPNT considered that stock status in relation to the Commission's BMSY and FMSY target reference points remains <b>unknown</b>.</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 Indo-Pacific king mackerel a limit to the catches should be considered by the Commission, by ensuring that future catches do not exceed the average catches between 2009 and 2011 estimated at the time of the assessment (46,787 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 Indo-Pacific king mackerel MSY was reached between 2009 and 2011. This catch advice should be maintained until an assessment of Indo-Pacific king mackerel is available. This catch advice should be maintained until an assessment of Indo-Pacific king mackerel is available. Considering that MSY-based reference</p>

Stock	Indicators		2015	2016	2017	2018	2019	Advice to the Commission
								<p>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: <a href="#">Appendix 21</a></p>
Narrow-barred Spanish mackerel <i>Scomberomorus commerson</i>	Catch 2018: 149,263 t Average catch 2014-2018: 163,209 t MSY (1,000 t) [*]: 131 [96–180] $F_{MSY}$ [*]: 0.35 [0.18–0.7] $B_{MSY}$ (1,000 t) [*]: 371 [187–882] $F_{2015}/F_{MSY}$ [*]: 1.28 [1.03–1.69] $B_{2015}/B_{MSY}$ [*]: 0.89 [0.63–1.15] $B_{2015}/B_0$ [*]: 0.44 [0.31–0.57]				89%			<p>No new stock assessment for Narrow-barred Spanish mackerel was carried out in 2019, thus, the stock status is determined on the basis of the 2017 assessment and other indicators presented in 2019.</p> <p>Based on the weight-of-evidence available, the stock appears to be <b>overfished and subject to overfishing</b>.</p> <p>There is a continued high risk of exceeding MSY-based reference points by 2025, even if catches are reduced to 80% of the 2015 levels (73% risk that <math>B_{2025} &lt; B_{MSY}</math>, and 99% risk that <math>F_{2025} &gt; F_{MSY}</math>). The modelled probabilities of the stock achieving levels consistent with the MSY reference levels (e.g. <math>B &gt; B_{MSY}</math> and <math>F &lt; F_{MSY}</math>) in 2025 are 93% and 70%, respectively, for a future constant catch at 70% of current catch level. If catches are reduced by 30% of the 2015 levels at the time of the assessment, which corresponds to catches below MSY, the stock is expected to recover to levels above the MSY reference points with at least a 50% probability by 2025.</p> <p>Click here for a full stock status summary: <a href="#">Appendix 22</a></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	2015	2016	2017	2018	2019	Advice to the Commission
Blue shark <i>Prionace glauca</i>	Reported catch 2018: 23,338 t Estimated catch 2015: 54,735 t Not elsewhere included (nei) sharks 2017: 52,487 t Average reported catch 2013–17: 29,293 t Average estimated catch 2011–15: 54,993 t Ave. (nei) sharks <sup>2</sup> 2012–16: 50,677 t MSY (1,000 t) (80% CI): 33.0 (29.5 - 36.6) F <sub>MSY</sub> (80% CI): 0.30 (0.30 - 0.31) SSB <sub>MSY</sub> (1,000 t) (80% CI): 39.7 (35.5 - 45.4) F <sub>2015</sub> /F <sub>MSY</sub> (80% CI): 0.86 (0.67 - 1.09) SSB <sub>2015</sub> /SSB <sub>MSY</sub> (80% CI): 1.54 (1.37 - 1.72) SSB <sub>2015</sub> /SSB <sub>0</sub> (80% CI): 0.52 (0.46 - 0.56)			72.6%			<p>No new stock assessment for blue sharks was carried out in 2019, thus, the stock status is determined on the basis of the 2017 assessment and other indicators presented in 2019.</p> <p>On the weight-of-evidence currently available, the stock status is determined to be <b>not overfished</b> and <b>not subject to overfishing</b>. Even though the blue shark in 2017 is assessed to be not overfished nor subject to overfishing, current catches are likely to result in decreasing biomass and making the stock become overfished and subject to overfishing in the near future. If the Commission wishes to maintain stocks above MSY reference levels (<math>B &gt; B_{MSY}</math> and <math>F &lt; F_{MSY}</math>) with at least a 50% probability over the next 10 years, then a reduction of 20% in catches is advised. The stock should be closely monitored. Mechanisms need to be developed by the Commission to improve current statistics, by ensuring CPCs comply with their recording and reporting requirement on sharks, so as to better inform scientific advice in the future.</p> <p>Click below for a full stock status summary:</p> <ul style="list-style-type: none"> <li>Blue sharks – <a href="#">Appendix 23</a></li> </ul>
Oceanic whitetip shark <i>Carcharhinus longimanus</i>	Reported catch 2018: 35 t Not elsewhere included (nei) sharks: 35,758 t Average reported catch 2014–2018: 201 t Not elsewhere included (nei) sharks: 47,537 t						<p>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.</p> <p>Click below for a full stock status summary:</p> <ul style="list-style-type: none"> <li>Oceanic whitetip sharks – <a href="#">Appendix 24</a></li> <li>Scalloped hammerhead sharks – <a href="#">Appendix 25</a></li> <li>Shortfin mako sharks – <a href="#">Appendix 26</a></li> <li>Silky sharks – <a href="#">Appendix 27</a></li> <li>Bigeye thresher sharks – <a href="#">Appendix 28</a></li> </ul>
Scalloped hammerhead shark <i>Sphyrna lewini</i>	Reported catch 2018: 19 t Not elsewhere included (nei) sharks: 35,758 t Average reported catch 2014–2018: 47,537 t Not elsewhere included (nei) sharks:						
Shortfin mako <i>Isurus oxyrinchus</i>	Reported catch 2018: 1,499 t Not elsewhere included (nei) sharks: 35,758 t Average reported catch 2014–2018: 1,582 t						

	Not elsewhere included (nei) sharks:	47,537 t							<ul style="list-style-type: none"> <li>• Pelagic thresher sharks– <a href="#">Appendix 29</a></li> </ul>
Silky shark <i>Carcharhinus falciformis</i>	Reported catch 2018:	1,503 t							
	Not elsewhere included (nei) sharks:	35,758 t							
	Average reported catch 2014–2018:	2,162 t							
	Not elsewhere included (nei) sharks:	47,537 t							
Bigeye thresher shark <i>Alopias superciliosus</i>	Reported catch 2018:	2 t							
	Not elsewhere included (nei) sharks:	35,758 t							
	Average reported catch 2014–2018:	0 t							
	Not elsewhere included (nei) sharks:	47,537 t							
Pelagic thresher shark <i>Alopias pelagicus</i>	Reported catch 2018:	1 t							
	Not elsewhere included (nei) sharks:	35,758 t							
	Average reported catch 2014–2018:	0 t							
	Not elsewhere included (nei) sharks:	47,537t							

\*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		