



## UPDATES ON YELLOWFIN TUNA CATCH LIMITS FOR 2022 AND 2023

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### Purpose

To inform participants at the 18<sup>th</sup> Working Party on Data Collection and Statistics (WPDCS18) on the yellowfin tuna catch limits for 2022 (calculated) and 2023 (estimated) resulting from the application of the criteria set forth by IOTC Resolution 19/01 and 21/01 to the historical catch data of IOTC CPCs.

### Background

Considering among others:

- the discussions of the Working Parties on Tropical Tuna on the limitations and the uncertainties in the stock assessment models due to the unavailability of standardized yellowfin tuna CPUE data, and
- the objectives of the Commission to maintain stocks in perpetuity (and with high probability) at levels not less than those capable of producing their maximum sustainable yield

The IOTC adopted – at the 20<sup>th</sup> Session of its Commission in 2016 – [IOTC Resolution 16/01](#) *On interim plan for rebuilding the Indian Ocean yellowfin tuna stock in the IOTC area of competence*, which among other things called IOTC CPCs to reduce their future catches of yellowfin tuna on a gear-specific basis, if and when these exceeded a given threshold.

Res. 16/01 was eventually superseded by Resolutions [17/01](#), [18/01](#) and [19/01](#) which brought in minor changes to the procedures for the determination of per-gear catch reductions, while introducing mechanisms to penalize those CPCs that would exceed the maximum catch levels in one or more consecutive years.

In this document we will refer to the latest version of these resolutions (19/01, which still remains binding for five CPCs, while 18/01 remains binding for one) to compare its applicability and results with the outputs of Resolution [21/01](#).

The following points shall be noted:

- the **limits of applicability** of Res. 16/01, 17/01, 18/01 and 19/01, as indicated in the first paragraph of each version:  
*“This resolution shall apply to all fishing vessels targeting tuna and tuna like species in the Indian Ocean of 24 meters overall length and over, and those under 24 meters if they fish outside the EEZ of their flag State, within the IOTC area of competence”*
- the **source of historical catches** to be used to produce estimates of catch reductions and maximum catch levels is the [best scientific estimates of nominal catches](#) agreed by the IOTC Scientific Committee, with the exception of Indonesia whose catches are derived from the national Reports submitted to the IOTC Scientific Committee
- that India objected to Res. 19/01, and therefore Res. 18/01 remains binding in their case

The catch reductions requested by Res. 19/01 are limited to industrial fisheries only (see the *limits of applicability* of the Resolution), notwithstanding the fact that almost 50% of total catches of yellowfin tuna in the Indian Ocean are accounted for by artisanal fisheries in recent years.

Considering that both Res. 18/01 and 19/01 only apply to industrial catches, India's objection to Res. 19/01 does not introduce any difference in the output catch limits, as India did not report any active industrial fishery for tuna and tuna-like species exceeding the set threshold for the years 2016 and following, and therefore is not currently subject to any yellowfin tuna catch limit.

It is also worth recalling that the adoption of IOTC best scientific estimates to determine catch limits and the expected reductions in future catch levels could potentially introduce differences with catch limits calculated using official catch data available to IOTC CPCs, as the best scientific estimates attempt to break catches for species aggregates that might include yellowfin and – in some circumstances – re-estimate the species / gear composition of a given CPC as a whole (e.g., Indonesian artisanal fisheries).

In December 2020 the IOTC Secretariat prepared a summary table with the results of the application of Res. 19/01 to current catches of IOTC CPCs until 2019 which was eventually disseminated as [IOTC CIRCULAR 2020-55](#) (“*Regarding Resolution 19/01 yellowfin tuna allocated catch limits for 2021*”) and superseded by [IOTC CIRCULAR 2020-55 rev1](#) (“*Correction notice regarding Resolution 19/01 yellowfin tuna allocated catch limits for 2021*”).

Similarly, in December 2021 the IOTC Secretariat prepared a set of updated summary tables presenting the same outputs this time with the incorporation of the criteria expressed by Res. 21/01 (for the CPCs that did not object to its implementation), and with a tentative estimation of catch limits for 2022 which were disseminated as [IOTC CIRCULAR 2021-78](#) (“*Regarding yellowfin tuna allocated catch limits for 2022*”) and further complemented by [IOTC CIRCULAR 2022-04](#) (“*Regarding the interpretation of Resolution 21/01 in relation to the yellowfin tuna allocated catch limits for 2022*”), which provides additional details on the way in which penalty mechanisms were incorporated in the estimates.

## **IOTC Resolution 21/01**

Res. 21/01 was adopted by the IOTC at its 25<sup>th</sup> session in June 2021. Objections were received after its adoption and therefore an extension period of 60 days was further applied.

However, only six objections were received and as these accounted for less than one third of the members the Resolution entered in force on 17 December 2021.

Compared to the previous resolutions (Res. 19/01 and preceding) the limits of applicability of Res. 21/01 are wider, as recalled by its first paragraph:

*“This resolution shall apply to all CPCs within the IOTC area of competence”*

which basically confirms that the resolution is relevant to **all** fisheries catching yellowfin tuna in the Indian Ocean, regardless of the size and area of operation of the vessels involved.

For this reason, Res. 21/01 takes into account also catches from artisanal fisheries to establish the base catch levels for each CPC and determine future catch reductions (when applicable). Artisanal catches were not considered *by design* in the preceding versions of this resolution, so catch levels and catch reductions are now global (at CPC level) and not gear-specific as in the past.

Several different conditions apply to determine the CPCs subject to catch reductions and the extent of the latter under Res. 21/01, including:

- a) Catch levels for the year 2014 (to determine how the resolution applies)
- b) Nature of each CPC (coastal state, SIDS, distant water fishing nation)
- c) Development classification<sup>1</sup> of each CPC (least developed, developing, developed)
- d) Historical catch levels from 2014 to 2019 (chosen with different criteria depending on a), b), and c))
- e) Reductions from the catch levels identified in d) to determine the base catch limits (also depending on a), b) and c))

<sup>1</sup> Source: [United Nations World Economic Situation and Prospects, 2020](#)

- f) Potential penalties deriving from the application of IOTC Res. 19/01 to the years 2020 and 2021

Discussions on the various proposals for Res. 21/01 were supported by interactive simulations prepared by the IOTC Secretariat and based on best scientific estimates of historical catch data for years until 2019. These simulations were particularly useful to compare the outputs emerging from the two distinct proposals under consideration, and to assess the effect of changes in the revisions of criteria and reduction percentages.

The approval of the final proposal for Res. 21/01 was objected by the following six CPCs, to which one of the preceding resolutions (Res. 18/01 or Res. 19/01) still applies:

1. Indonesia
2. India (objected to Res. 19/01, and therefore Res. 18/01 applies in their case)
3. I.R. Iran
4. Oman
5. Madagascar
6. Somalia

The provisions of IOTC Res. 21/01 became effective on 1 January 2022, although due to the current IOTC data reporting cycle detailed information on catch levels for 2021, which are crucial to determine catch limits for 2022, were not available until 30 June 2022.

This paper provides an update on the **effective** yellowfin tuna catch limits for 2022 calculated using the officially reported catch data for 2021, and attempts to estimate **tentative** catch limits for 2023 by considering:

- a) That resolutions other than 21/01 might be binding for some CPCs, with all additional constraints that these imply (e.g., use of National Report catch data for Indonesia in the context of Res. 19/01)
- b) That catch levels for 2022 are not yet available, and that therefore the provided estimations for 2023 are based on assumptions that will be confirmed / falsified as soon as official catch data for 2022 is provided by all concerned CPCs (i.e., by the end of June 2023, tentatively)
- c) That for CPCs non objecting to Res. 21/01, Res. 19/01 remained in force until 31 December 2021, and that for this reason estimated penalties (in the form of additional catch reductions) might need to be applied to catch limits determined for 2022 for some CPCs, even in the context of Res. 21/01
- d) That Res. 21/01 applies to all fisheries, for which it determines catch limits on a CPC-by-CPC basis from 2022 onwards
- e) That Res. 19/01 applies to catches from industrial fisheries only, and that therefore artisanal catches for the CPCs bound to Res. 19/01 are not limited in any way
- f) That official catch data from Indonesia (to be used for the estimation of catch limits according to Res. 19/01) might be subject to revisions during the year, and furthermore differ from the best scientific estimates of nominal catches for the fisheries and years concerned

## Catch limit calculations

Considering the above, the estimation of catch limits and potential penalties in agreement with Res. 19/01 and 21/01 is a necessary requirement to produce the actual catch limits for 2022 and the estimated catch limits for 2023.

The estimation of catch limits according to Res. 19/01 applies to all non-objecting CPCs until 2021, and to all other until further notice, including those that are currently bound to Res. 21/01 as the latter has specific provisions to incorporate penalties from the former.

The IOTC Secretariat has prepared two sets of estimations, taking in consideration:

- 1) **Fishery-specific catch limits and penalties** for CPCs with industrial fisheries active in the Indian Ocean (according to Res. 18/01 and 19/01)
- 2) **Global catch limits for all CPCs** (according to Res. 21/01), which also include estimations for those CPCs objecting to Res. 21/01 as a reference

and the results of these estimations are presented in [Appendix 1](#) and [Appendix 2](#), respectively.

## Details on the calculation of base annual limits, overcatches and annual catch limits (2020-2023) according to Resolution 19/01

### Calculation of base annual limits

**Table A2** provides an overview of the information and procedures used to calculate the base annual limits **c** for all concerned fisheries (that applies from 2020 onwards) as well as the overcatches **f** resulting from the catch history in the years 2017-2019 (2018-2019 for Seychelles purse-seine and longline fisheries, and 2018-2019 for Maldives pole-and-line and handline fisheries).

The table includes four sub-sections, one for each gear category for which there are catches of yellowfin tuna reported by an industrial fishery active in the Indian Ocean from 2014 onwards, and the produced base annual limits **c** are now consolidated.

The cells highlighted in yellow identify the CPC that objected to Res. 21/01 and for which Res. 19/01 is currently binding regarding the determination of catch limits for 2022 and following years.

The **Year** and **Reduction** columns under the **Baseline** header indicate, for each industrial gear category / CPC combination, the baseline year and the expected, gear-specific reduction on catches recorded for that year.

The annual limit **c** results from applying the identified reduction to catches from the baseline year according to:

$$(1) \quad c = \text{catch}(\text{year}_{\text{baseline}}) \times (1 - \text{reduction}_{\text{baseline}}) \quad [ \text{base annual limit} ]$$

with  $\text{reduction}_{\text{baseline}}$  being a decimal value between 0 and 1 included, determined from the various criteria that apply to the specific gear category / CPC combination according to Res. 19/01

The sum of annual catch limits **d** is determined as (see Para. 9 of Res. 19/01):

$$(2) \quad d = c \times 2 \quad [ \text{threshold of base annual limits} ]$$

for Seychelles PS and LL and for Maldives BB and HL, or as:

$$(3) \quad d = c \times 3 \quad [ \text{threshold of base annual limits} ]$$

for all other fleets and fisheries.

The accumulated catch **e** is determined as (see Para. 9 of Res. 19/01):

$$(4) \quad e = \text{catch}(2018) + \text{catch}(2019) \quad [ \text{accumulated historical catches} ]$$

for Seychelles PS and LL and for Maldives BB and HL, or as:

$$(5) \quad e = \text{catch}(2017) + \text{catch}(2018) + \text{catch}(2019) \quad [ \text{accumulated historical catches} ]$$

for all other fleets and fisheries

The initial over-catch **f** is determined as:

$$(6) \quad f = 0 \quad [ \text{initial overcatch} ]$$

when  $e \leq d$ , or as:

$$(7) \quad f = e - d \quad [ \text{initial overcatch} ]$$

when  $e > d$ .

Considering that the information currently available on annual yellowfin tuna catches by CPC and gear spans from 1950 to 2021 (as of November 2022), it is therefore possible to calculate the effective catch limit for 2022 according to Res. 19/01.

On the contrary, calculating the catch limit for 2023 (for those CPCs objecting to Res. 21/01, and to which 19/01 still applies) requires information on catches of yellowfin tuna for the statistical year 2022 for all CPCs / fishery concerned.

Therefore, in absence of this data, the catch limit for 2023 is estimated assuming that catches of yellowfin tuna for 2022 (by CPC / fishery) are at the same exact level as the calculated catch limit for 2022 (data available to the Secretariat), i.e., that CPCs have caught the maximum amount of yellowfin tuna possible given their respective catch limit for the year.

### Calculation of annual catch limits for 2020-2022 and estimation of catch limit for 2023

**Table A3** provides an overview of the information and process used to **calculate** the catch limits for 2020-2022 (columns **c**, **f**, and **i**) and **estimate** the catch limits for 2023 (column **l**), including references to the base annual limit (column **a**, derived from **Table A2**) and to the catches / overcatches for 2020 and 2021 (columns **d**, **e** and **g**, **h**, respectively).

Catch limits for 2022-2023 in this table are calculated / estimated only for those CPCs for which Res. 19/01 remains binding.

The process unrolls as follows:

- The catch limit **c** for 2020 is set to the base annual limit **a**, as 2020 is the first year of application of Res. 19/01
- The overcatches **e** for 2020 are calculated as the difference between the reported catches **d** for 2020 and the catch limit **c** for 2020, i.e.:

$$(8) \quad e = d - c \quad [ \text{calculated overcatches for 2020} ]$$

when  $c \leq d$ , or as:

$$(9) \quad e = 0 \quad [ \text{calculated overcatches for 2020} ]$$

when  $c > d$  (i.e., annual catches are lower than the catch limit)

- The catch limit **f** for 2021 is calculated as the base annual limit **a**, minus the combined overcatches **b** for 2017, 2018, 2019, minus 50% of the overcatches **e** for 2020, i.e.:

$$(10) \quad f = a - b - e / 2 \quad [ \text{calculated catch limit for 2021} ]$$

- The overcatches **h** for 2021 are calculated as the difference between the reported catches **g** for 2021 and the calculated catch limit **f** for 2021, i.e.:

$$(11) \quad h = g - f \quad [ \text{calculated overcatches for 2021} ]$$

when  $f \leq g$ , or as:

$$(12) \quad h = 0 \quad [ \text{calculated overcatches for 2021} ]$$

when  $f > g$  (i.e., annual catches are lower than the catch limit)

- The catch limit **i** for 2022 is calculated as the base annual limit **a**, minus 50% of the overcatches **h** for 2021, minus 50% of the overcatches **e** for 2020, i.e.:

$$(13) \underline{j} = a - h/2 - e/2$$

[ *calculated catch limit for 2022* ]

- In absence of other information, to estimate the potential overcatches for 2022 we assume that catch levels for 2022 are identical to the catch limit calculated for 2022, and that therefore that ***catch(2022) = limit(2022)***
- Hence, the overcatches ***k*** for 2022 are estimated as:

$$(14) \underline{k} = j - i$$

[ *estimated overcatches for 2022* ]

and are generally equal to zero, as we assume that catches for 2022 have the same level of the calculated limit for the year, except those CPC / gear combinations with a **negative** catch limit, for which 2022 catch levels are assumed to be zero.

- Finally, the catch limit ***l*** for 2023 is estimated as the base catch limit ***a***, minus 50% of the overcatches ***k*** for 2022, minus 50% of the overcatches ***h*** for 2021:

$$(15) \underline{l} = a - k/2 - h/2$$

[ *estimated catch limit for 2023* ]

- The penalties (i.e., deducted overcatches) assigned to the catch limits as per (13) and (15) are incremented by 25%<sup>2</sup> if overcatches occur for two consecutive years (2020-2021 or 2021-2022).

The results of applying (15) to the CPCs still bound by Res. 19/01 are shown in the column ***l*** of **Table A3** and represent the estimated 2023 catch limits by type of industrial fishery for the CPCs objecting to Res. 21/01.

## Details on the calculation of base annual limits and annual catch limits (2022-2023) according to Resolution 21/01

### Calculation of base annual limit

**Table A4** provides an overview of the procedure and supporting information used to calculate the base catch limits for each bound CPC according to paragraphs 5-13 of IOTC Res. 21/01.

These theoretical limits are exclusively based on historical catches of yellowfin tuna from 2014 to 2019 and on the status and classification of each CPC, and therefore are not affected by catch levels reported for the statistical years from 2020 onwards.

The annual catch limit for 2022 is **calculated** by deducting from the base annual limit the penalties estimated in accordance with Res. 19/01<sup>3</sup> using available catches up to 2021.

Conversely, the annual catch limits for 2023 and following years are **estimated** by deducting from the base annual limit the penalties calculated in accordance with Res. 19/01 (for the years up to 2021) and the penalties calculated in accordance with Res. 21/01 for 2022 and following years<sup>4</sup>.

As already done for the calculation of catch limits for 2023 in the context of Res. 19/01, the **estimated** catch limits introduced by Res. 21/01 for 2023 will be determined with the assumption that catch levels for 2022 are exactly at the same level as the **calculated** catch limit for the same year.

All data on catches included in **Table A4** are taken from the IOTC best scientific estimates, and the resulting calculated base annual limits ***j*** are in line with the simulations performed during (and agreed by) the 25<sup>th</sup> Session of the Commission in June 2021.

**Table A4** presents the results of this calculation for all CPCs bound by Res. 21/01.

<sup>2</sup> Res. 19/01 – Paragraph 13.c

<sup>3</sup> Res. 21/01 – Paragraph 14.a

<sup>4</sup> Res. 21/01 – Paragraph 14.b

More specifically, the columns **Year** and **Catches (h)** under the **Reference** header indicate the reference year (or years) and the corresponding catches for each CPC which constitute the starting point from which base annual limits are further determined.

The **Criteria** column under the **Catch limit (2022)** header indicates the paragraph – in the text of Res. 21/01 – where the specific criteria that applies to each CPC is reported and is identified based on the historical catch series, CPC status (i.e., *coastal, small island developing state, distant water fishing nation*) and level of development (i.e., *least developed, developing, developed*) of each CPC.

In general terms, the base annual limit **j** is determined through the application of the percentage of reduction **i** to the reference catches **h** according to the formula:

$$(16) j = h \times (1 - i) \quad [ \text{base annual limit} ]$$

where the percentage **i** is expressed as a decimal value between 0 and 1 (included).

The base annual limit calculated through (16) is only considered for those CPCs for which the criteria in paragraphs 5 and 6 of Res. 21/01 apply (see the **Criteria** column in **Table A4**).

For all other CPCs, the base annual limit **j** is determined by how historical catches trigger the mutually exclusive criteria in paragraphs 7-9 of Res. 21/01, and can correspond to one of the following:

$$(17) j = \quad [ \text{base annual limit} ]$$

- The maximum catch level reported across the years 2017-2019 for those CPCs identified under para. 7, or
- 500 t or 700 t for those CPCs identified under paras. 8 and 9, or
- 2000 t for those CPCs identified under para. 8

The base annual limit **j** does not necessarily correspond to the calculated catch limit for the year 2022, as other factors came into play when determining the latter, and specifically the overcatches recorded for the years 2020 and 2021 calculated in accordance with Res. 19/01, that was still enforced during those years.

### Calculation of annual catch limit for 2022 and estimation of catch limit for 2023

**Table A5** provides an overview of the information and process used to **calculate** the catch limits for 2022 (column **e**) and **estimate** the catch limits for 2023 (column **h**), including references to the base annual limit (column **a**, derived from **Table A4**) and to the catches / overcatches for 2022 (columns **f** and **g**, respectively).

Catch limits for 2022-2023 in this table are calculated / estimated only for those CPCs for which Res. 21/01 remains binding.

The process unrolls as follows:

- The catch limit **e** for 2022 is set to the base annual limit **a**, minus 50% of the overcatches **b** for 2020, minus 50% of the overcatches **c** for 2021, i.e.:

$$(18) e = a - b/2 - c/2 \quad [ \text{calculated catch limit 2022} ]$$

- In absence of other information, to estimate the potential overcatches for 2022 we assume that catch levels for 2022 are identical to the catch limit calculated for 2022, and that therefore that **catch(2022) = limit(2022)**
- Hence, the overcatches **g** for 2022 are estimated as:

$$(19) g = f - e \quad [ \text{estimated overcatches for 2022} ]$$

and are equal to zero, as we assume that catches for 2022 have the same level of the calculated limit for the year, i.e., **f = e**.



- The catch limit  $h$  for 2023 is estimated as the base annual limit  $a$ , minus 50% of the overcatches  $b$  for 2020, minus 50% of the overcatches  $c$  for 2021, minus 50% of the estimated overcatches  $g$  for 2022, i.e.:

$$(20) f = a - b/2 - c/2 - g/2$$

[ *estimated catch limit for 2023* ]

China, EU, and Seychelles are the only CPCs bound to Res. 21/01 that see their catch limit for 2022 reduced by the over-catches estimated for 2020 and 2021 according to Res. 19/01.

## Overall catch limits for 2020-2023

Table 1 and Table 2 below summarize the catch limits for CPCs bound to Res. 21/01 and Res. 19/01 respectively and are extracted from Table A1 provided in the appendices of this document.

YFT annual catch limits (t) for 2022 (calculated) and 2023 (estimated) as per Res. 21/01			
CPC	Base annual limit	Catch limits	
		2022	2023
AUS – Australia	2,000	2,000	2,000
BGD – Bangladesh	2,000	2,000	2,000
CHN – China	10,557	7,658	7,658
COM – Comoros	5,279	5,279	5,279
ERI – Eritrea	2,000	2,000	2,000
EU – European Union	73,078	72,447	72,447
FRA – France (territories)	500	500	500
GBR – United Kingdom (...)	500	500	500
JPN – Japan	4,003	4,003	4,003
KEN – Kenya	3,654	3,654	3,654
KOR – Republic of Korea	9,056	9,056	9,056
LKA – Sri Lanka	33,245	33,245	33,245
MDV – Maldives	47,195	47,195	47,195
MOZ – Mozambique	2,000	2,000	2,000
MUS – Mauritius	10,490	10,490	10,490
MYS – Malaysia	2,000	2,000	2,000
PAK – Pakistan	14,468	14,468	14,468
PHL – Philippines	700	700	700
SDN – Sudan	2,000	2,000	2,000
SYC – Seychelles	39,577	36,587	36,587
THA – Thailand	2,000	2,000	2,000
TZA – Tanzania	3,905	3,905	3,905
YEM – Yemen	26,262	26,262	26,262
ZAF – South Africa	2,000	2,000	2,000
<b>Totals</b>	<b>298,469</b>	<b>291,948</b>	<b>291,948</b>

**Table 1:** YFT annual catch limits (all fisheries, catches in tons) for 2022 (calculated) and 2023 (estimated) for CPCs currently bound to Res. 21/01. Catch limits for 2023 are estimated with the assumption that catches for 2022 do not exceed the catch limit calculated for the year.

Cells with lighter backgrounds correspond to CPC / years where the catch limit (calculated or estimated) is lower than the base annual catch.



YFT annual catch limits (t) for 2020, 2021, 2022 (calculated) and 2023 (estimated) as per Res. 19/01						
CPC	Fishery	Base annual limit	Catch limits			
			2020	2021	2022	2023
IDN – Indonesia	LL	11,381	11,381	11,381	11,381	11,381
	PS	12,395	12,395	7,515	1,666	3,402
	ART	-	-	-	-	-
IND - India	LL	-	-	-	-	-
	ART	-	-	-	-	-
IRN – I.R. Iran	GN	21,961	21,961	-28,907	-1,866	-8,989
	PS	-	-	-	-	-
	ART	-	-	-	-	-
MDG – Madagascar	LL	-	-	-	-	-
	ART	-	-	-	-	-
OMN – Oman	LL	-	-	-	-	-
	ART	-	-	-	-	-
SOM – Somalia	IND	-	-	-	-	-
	ART	-	-	-	-	-

**Table 2:** YFT annual catch limits (by fishery, catches in tons) for 2020, 2021, 2022 (calculated) and 2023 (estimated), for CPCs currently bound to Res. 18/01 (India) and 19/01 (all others). Catch limits for 2023 are estimated with the assumption that catches for 2022 do not exceed the catch limit calculated for the year.

Cells with lighter backgrounds correspond to CPC / fishery / years where the catch limit (calculated or estimated) is lower than the base annual catch.

Values in red correspond to negative catch limits.

LL = Industrial longline, PS = Industrial purse seine, GN = Industrial gillnet, ART = Artisanal, IND = All other industrial fisheries

## Conclusions

CPCs are invited to assess and review the procedures adopted to produce the outputs of **Table 1** and **Table 2**, confirm the validity of the results, and eventually provide a tentative estimate of their yellowfin tuna catches for 2022 (not yet available to the Secretariat) to update the estimates of catch limits for 2023.

All CPCs are also requested to consider how to best progress to ensure that catches of yellowfin tuna for the year 2023 are properly monitored and do not exceed the limits set overall (or by fishery) by the resolutions they are bound to.

**Appendix 1 – YFT catch limits for 2022 (calculated) and 2023 (estimated) according to Res. 19/01 and 21/01**

CPC			Base annual limit (t)	Catches (t)				Overcatches (19/01, t)			Annual catch limits				Resolution
Code	Status	Fishery		2018	2019	2020	2021	2017-2019	2020	2021	2020	2021	2022	2023 (estimated)	
IND	DG, C	IND	none	7	13	2	1	none	none	none	none	none	none	none	18/01
IND	DG, C	ART	none	37,481	33,541	20,793	24,515	none	none	none	none	none	none	none	
IDN**	DG, C	LL	11,381	9,610	4,261	5,656	10,555	-	-	-	11,381	11,381	11,381	11,381	19/01
IDN**	DG, C	PS	12,395	12,342	16,388	15,866	21,904	3,144	3,471	14,389	12,395	7,515	1,666	3,402	
IDN**	DG, C	ART	none	18,355	20,834	22,949	24,647	none	none	none	none	none	none	none	
IRN	DG, C	GN	21,961	35,534	44,024	20,607	18,746	50,868	-	47,653	21,961	- 28,907	- 1,866	- 8,989	
IRN	DG, C	ART	none	19,218	14,020	27,708	25,534	none	none	none	none	none	none	none	
MDG	LD, C	IND	none	29	40	33	29	none	none	none	none	none	none	none	
MDG	LD, C	ART	none	675	675	675	675	none	none	none	none	none	none	none	
OMN	DG, C	IND	none	177	297	207	168	none	none	none	none	none	none	none	
OMN	DG, C	ART	none	28,660	36,735	68,578	74,912	none	none	none	none	none	none	none	
SOM	LD, C	ALL	none	N/R	N/R	N/R	N/R	none	none	none	none	none	none	none	
CHN	DG, DW	LL	12,027	15,486	12,640	12,781	12,570	4,123	755	5,043	12,027	7,526	N/A	19/01 (until 2021)	
EU	DD, DW	PS	77,694	78,148	71,791	71,058	75,208	3,749	-	1,263	77,694	73,945			
LKA	DG, C	LL	7,763	8,554	10,746	7,481	5,255	2,461	-	-	7,763	5,302			
SYC	DG, S, C	LL	5,836	6,484	9,790	8,126	3,778	4,603	2,290	3,690	5,836	88			
SYC	DG, S, C	PS	33,211	35,023	33,006	30,502	29,407	1,607	-	-	33,211	31,605			
AUS	DD, C	ALL	2,000	39	46	18	18	-	-	-	N/A	2,000	2,000	21/01	
BGD	LD, C		2,000	-	-	2	142	-	-	-		2,000	2,000		
CHN	DG, DW		10,557	15,486	12,640	12,781	12,570	4,123	755	5,043		7,658	7,658		
COM	LD, S, C		5,279	3,194	5,279	6,745	3,770	-	-	-		5,279	5,279		
ERI	LD, C		2,000	N/R	N/R	N/R	N/R	-	-	-		2,000	2,000		
EU	DD, DW		73,078	78,877	72,501	71,800	76,040	3,749	-	1,263		72,447	72,447		
FRA	DD, C		500	-	-	-	-	-	-	-		500	500		
GBR	DD, DW		500	13	17	8	-	-	-	-		500	500		
JPN	DD, DW		4,003	3,382	2,597	2,083	931	-	-	-		4,003	4,003		
KEN	DG, C		3,654	3,592	3,654	3,563	3,641	-	-	-		3,654	3,654		
KOR	DG, DW		9,056	6,990	10,790	3,687	6,208	-	-	-		9,056	9,056		
LKA	DG, C		33,245	39,817	44,756	37,013	31,318	2,461	-	-		33,245	33,245		
MDV	DG, S, C		47,195	47,217	44,702	42,705	24,548	-	-	-		47,195	47,195		
MOZ	LD, C		2,000	155	269	301	358	-	-	-		2,000	2,000		
MUS	DG, S, C		10,490	11,656	12,684	9,779	9,711	-	-	-		10,490	10,490		
MYS	DG, C		2,000	446	428	374	391	-	-	-		2,000	2,000		
PAK	DG, C		14,468	18,384	9,358	7,919	8,470	-	-	-		14,468	14,468		
PHL	DG, DW		700	-	-	-	-	-	-	-		700	700		
SDN	LD, C		2,000	N/R	N/R	N/R	N/R	-	-	-		2,000	2,000		
SYC	DG, S, C		39,577	42,069	43,755	39,603	34,101	6,209	2,290	3,690		36,587	36,587		
THA	DG, C	2,000	-	-	-	1	-	-	-	2,000	2,000				
TZA	LD, C	3,905	3,904	3,905	3,905	3,905	-	-	-	3,905	3,905				
YEM	LD, C	26,262	18,077	18,110	18,134	18,134	-	-	-	26,262	26,262				
ZAF	DG, C	2,000	331	389	217	308	-	-	-	2,000	2,000				

**Table A1:** Catch limits for 2022 (actual) and 2023 (estimated) by CPC objecting / subject to Res. 21/01.

## Appendix 2 – YFT base annual limits and catch limits for 2022 (calculated) and 2023 (estimated) according to Res. 19/01

1. Purse seine													
CPC	Status	Baseline		Catch (tonnes)						c. Base annual limit	Res. 19/01 para 13a (2017, 2018, 2019)*		f. Overcatch 2017+2018+2019* = e- d
		Year	Reduction	2014	2015	2016	2017	2018	2019		d. Sum of annual limits = c x 3**	e. Accumulated catch	
EU	DD, DW	2014	15.0%	91,405	86,149	87,075	86,893	78,148	71,791	77,694	233,083	236,832	3,749
IDN~	DG, C	2014	15.0%	14,582	8,363	10,786	11,598	12,342	16,388	12,395	37,184	40,328	3,144
KOR	DG, DW	2014	15.0%	8,852	7,509	10,347	6,362	5,415	8,730	7,524	22,573	20,507	-
MUS	DG, S, C	2018	7.5%	4,844	5,448	7,404	7,681	11,322	12,290	10,473	31,419	31,293	-
SYC	DG, S, C	2015	15.0%	23,463	39,072	40,014	41,694	35,023	33,006	33,211	66,422	68,029	1,607

  

2. Longline													
Fleet	Status	Baseline		Catch (tonnes)						c. Base annual limit	Res. 19/01 para 13a (2017, 2018, 2019)*		f. Overcatch 2017+2018+2019* = e- d
		Year	Reduction	2014	2015	2016	2017	2018	2019		d. Sum of annual limits = c x 3**	e. Accumulated catch	
CHN	DG, DW	2014	10.0%	13,363	15,714	18,770	12,077	15,486	12,640	12,027	36,080	40,203	4,123
IDN~	DG, C	2014	10.0%	12,645	10,549	10,404	10,527	9,610	4,261	11,381	34,142	24,398	-
SYC	DG, S, C	2018	10.0%	1,606	2,339	2,739	3,647	6,484	9,790	5,836	11,671	16,274	4,603
LKA	DG, C	2014	10.0%	8,625	5,933	3,939	6,448	8,554	10,746	7,763	23,288	25,748	2,461

  

3. Gillnet													
Fleet	Status	Baseline		Catch (tonnes)						c. Base annual limit	Res. 19/01 para 13a (2017, 2018, 2019)		f. Overcatch 2017+2018+2019 = e- d
		Year	Reduction	2014	2015	2016	2017	2018	2019		d. Sum of annual limits = c x 3	e. Accumulated catch	
IRN	DG, C	2014	10.0%	24,401	26,780	31,079	37,193	35,534	44,024	21,961	65,883	116,751	50,868

  

4. Other gears													
Fleet	Status	Baseline		Catch (tonnes)						c. Base annual limit	Res. 19/01 para 13a + 9 for SIDS (2018, 2019)		f. Overcatch 2018+2019 = e- d
		Year	Reduction	2014	2015	2016	2017	2018	2019		d. Sum of annual limits = c x 2	e. Accumulated catch	
MDV BB	DG, S, C	2014	5.0%	11,416	9,270	4,978	10,543	10,749	10,165	10,845	21,690	20,914	-
MDV HL	DG, S, C	2014	5.0%	17,831	19,247	24,648	16,713	16,704	15,918	16,939	33,879	32,622	-

Catch data 2014-2019 from IOTC best scientific estimates      CPCs that objected to Res. 21/01 and to whom Res. 19/01 still applies

~ Catch data 2014-2019 from National Reports (IOTC-2021-SC24-NR09 and previous)

\* 2018-2019 for Seychelles

\*\* c x 2 for Seychelles

**Table A2:** Calculated base annual limits (column c) and historical over-catch (column f) for industrial fisheries subject to reductions according to Res. 19/01.

1. Purse seine				2020			2021			2022			2023
CPC	Status	a. Base annual limit	b. Overcatch 2017+2018+2019*	c. Limit = a	d. Catch	e. Overcatch = d - c	f. Limit = a - b - e/2	g. Catch	h. Overcatch = g - f	i. Limit = a - h/2 - e/2	j. Catch = i	k. Overcatch = j - i	l. Limit = a - k/2 - h/2
EU	DD, DW	77,694	3,749	77,694	71,058	-	73,945	75,208	1,263.0	N/A	N/A	N/A	See 21/01
IDN~	DG, C	12,395	3,144	12,395	15,866	3,471	7,515	21,904	14,388.9	1,666	1,666	-	3,402
KOR	DG, DW	7,524	-	7,524	2,393	-	7,524	5,806	-	N/A	N/A	N/A	See 21/01
MUS	DG, S, C	10,473	-	10,473	9,681	-	10,473	9,641	-	N/A	N/A	N/A	See 21/01
SYC	DG, S, C	33,211	1,607	33,211	30,502	-	31,605	29,407	-	N/A	N/A	N/A	See 21/01

  

2. Longline				2020			2021			2022			2023
Fleet	Status	a. Base annual limit	b. Overcatch 2017+2018+2019*	c. Limit = a	d. Catch	e. Overcatch = d - c	f. Limit = a - b - e/2	g. Catch	h. Overcatch = g - f	i. Limit = a - h/2 - e/2	j. Catch = i	k. Overcatch = j - i	l. Limit = a - k/2 - h/2
CHN	DG, DW	12,027	4,123	12,027	12,781	755	7,526	12,570	5,043.4	N/A	N/A	N/A	See 21/01
IDN~	DG, C	11,381	-	11,381	5,656	-	11,381	10,555	-	11,381	11,381	-	11,381
SYC	DG, S, C	5,836	4,603	5,836	8,126	2,290	88	3,778	3,690.4	N/A	N/A	N/A	See 21/01
LKA	DG, C	7,763	2,461	7,763	7,481	-	5,302	5,255	-	N/A	N/A	N/A	See 21/01

  

3. Gillnet				2020			2021			2022			2023
Fleet	Status	a. Base annual limit	b. Overcatch 2017+2018+2019	c. Limit = a	d. Catch	e. Overcatch = d - c	f. Limit = a - b - e/2	g. Catch	h. Overcatch = g - f	i. Limit = a - h/2 - e/2	j. Catch = i	k. Overcatch = j - i	l. Limit = a - k/2 - h/2
IRN	DG, C	21,961	50,868	21,961	20,607	-	28,907	18,746	47,653.4	1,866	-	1,865.8	8,989

  

4. Other gears				2020			2021			2022			2023
Fleet	Status	a. Base annual limit	b. Overcatch 2018+2019	c. Limit = a	d. Catch	e. Overcatch = d - c	f. Limit = a - b - e/2	g. Catch	h. Overcatch = g - f	i. Limit = a - h/2 - e/2	j. Catch = i	k. Overcatch = j - i	l. Limit = a - k/2 - h/2
MDV BB	DG, S, C	10,845	-	10,845	10,697	-	10,845	7,085	-	N/A	N/A	N/A	See 21/01
MDV HL	DG, S, C	16,939	-	16,939	15,181	-	16,939	8,928	-	N/A	N/A	N/A	See 21/01

Catch data 2014-2019 from IOTC best scientific estimates (t)   CPCs that objected to Res. 21/01 and to whom Res. 19/01 still applies

~ Catch data 2014-2019 from National Reports (t)

\* 2018-2019 for Seychelles

\*\* c x 2 for Seychelles

**Table A3:** Annual catch limits for industrial fisheries subject to Res. 19/01 for the years 2020-2022 (columns *c, f, i*, calculated) and 2023 (column *l*, estimated), the latter only for the industrial gears of those CPCs objecting to Res. 21/01.

Catches for 2022 (column *j*) estimated to the same exact level of catch limits calculated for 2021 (column *i*).

### Appendix 3 – YFT base annual limits and catch limits for 2022 (calculated) and 2023 (estimated) according to Res. 21/01

CPC		Catches (best scientific estimates)						Reference		Catch limit (2022)		
Code	Status	2014	2015	Average (2017-2019)	Max (2017-2019)	2018	Last year (2021)	Year	h. Catches	i. Reduction	Criteria	j. Base annual limit = $h * (1 - i)$ or fixed
AUS	DD, C	20	73	50	66	39	18	2014	20	-	Para. 8	2,000
BGD	LD, C	-	-	-	-	-	142	2014	-	-	Para. 8	2,000
CHN	DG, DW	13,363	15,714	13,401	15,486	15,486	12,570	2014	13,363	21%	Para. 5	10,557
COM	LD, S, C	1,399	1,748	4,426	5,279	3,194	3,770	2017-2019 (max)	5,279	-	Para. 7	5,279
ERI	LD, C	-	-	-	-	-	-	2014	-	-	Para. 8	2,000
EU	DD, DW	92,504	87,157	79,688	87,686	78,877	76,040	2014	92,504	21%	Para. 5	73,078
FRA	DD, C	-	-	-	-	-	-	2014	-	-	Para. 8 + 9	500
GBR	DD, DW	88	87	18	23	13	-	2014	88	-	Para. 8 + 9	500
JPN	DD, DW	4,072	3,478	3,327	4,003	3,382	931	2017-2019 (max)	4,003	-	Para. 7	4,003
KEN	DG, C	71	108	2,550	3,654	3,592	3,641	2017-2019 (max)	3,654	-	Para. 7	3,654
KOR	DG, DW	10,409	9,183	8,648	10,790	6,990	6,208	2014	10,409	13%	Para. 5 + 11	9,056
LKA	DG, C	37,778	32,673	40,850	44,756	39,817	31,318	2014	37,778	12%	Para. 5.a	33,245
MDV	DG, S, C	49,212	52,439	47,093	49,361	47,217	24,548	2015	52,439	10%	Para. 5.b + 10	47,195
MOZ	LD, C	5	69	197	269	155	358	2014	69	-	Para. 8	2,000
MUS	DG, S, C	4,908	5,530	10,786	12,684	11,656	9,711	2018	11,656	10%	Para. 6.b	10,490
MYS	DG, C	77	144	419	446	446	391	2014	144	-	Para. 8	2,000
PAK	DG, C	16,441	18,817	18,509	27,784	18,384	8,470	2014	16,441	12%	Para. 5.a	14,468
PHL	DG, DW	69	-	24	73	-	-	2014	69	-	Para. 8 + 9	700
SDN	LD, C	-	-	-	-	-	-	2014	-	-	Para. 8	2,000
SYC	DG, S, C	25,079	41,468	43,974	46,099	42,069	34,101	2017-2019 (avg.)	43,974	10%	Para. 5.b + 10	39,577
THA	DG, C	187	109	-	-	-	1	2014	187	-	Para. 8	2,000
TZA	LD, C	3,441	4,011	3,904	3,905	3,904	3,905	2017-2019 (max)	3,905	-	Para. 7	3,905
YEM	LD, C	29,180	24,518	18,083	18,110	18,077	18,134	2014	29,180	10%	Para. 5.b + 10	26,262
ZAF	DG, C	83	182	323	389	331	308	2014	182	-	Para. 8	2,000

Catches:  $0 \leq \text{catches} < 2000 \text{ t}$ ;  $2000 \text{ t} \leq \text{catches} < 5000 \text{ t}$ ;  $\text{catches} \geq 5000 \text{ t}$

Status: LD = least developed country, DG = developing country, DD = developed country, S = small islands developing state, C = coastal state, DW = distant water fishing nation

**Table A4:** Calculated base annual limits (column j) for CPCs subject to Res. 21/01.

CPC		a. Base annual limit	Overcatches (19/01)		2021	2022			2023
Code	Status		b. 2020	c. 2021	d. Catches	e. Limit = a - b/2 - c/2	f. Catches = e	g. Overcatch = f - e	h. Limit = a - b/2 - c/2 - g/2
AUS	DD, C	2,000	-	-	18	2,000	2,000	-	2,000
BGD	LD, C	2,000	-	-	142	2,000	2,000	-	2,000
CHN	DG, DW	10,557	755	5,043	12,570	7,658	7,658	-	7,658
COM	LD, S, C	5,279	-	-	3,770	5,279	5,279	-	5,279
ERI	LD, C	2,000	-	-	-	2,000	2,000	-	2,000
EU	DD, DW	73,078	-	1,263	76,040	72,447	72,447	-	72,447
FRA	DD, C	500	-	-	-	500	500	-	500
GBR	DD, DW	500	-	-	-	500	500	-	500
JPN	DD, DW	4,003	-	-	931	4,003	4,003	-	4,003
KEN	DG, C	3,654	-	-	3,641	3,654	3,654	-	3,654
KOR	DG, DW	9,056	-	-	6,208	9,056	9,056	-	9,056
LKA	DG, C	33,245	-	-	31,318	33,245	33,245	-	33,245
MDV	DG, S, C	47,195	-	-	24,548	47,195	47,195	-	47,195
MOZ	LD, C	2,000	-	-	358	2,000	2,000	-	2,000
MUS	DG, S, C	10,490	-	-	9,711	10,490	10,490	-	10,490
MYS	DG, C	2,000	-	-	391	2,000	2,000	-	2,000
PAK	DG, C	14,468	-	-	8,470	14,468	14,468	-	14,468
PHL	DG, DW	700	-	-	-	700	700	-	700
SDN	LD, C	2,000	-	-	-	2,000	2,000	-	2,000
SYC	DG, S, C	39,577	2,290	3,690	34,101	36,587	36,587	-	36,587
THA	DG, C	2,000	-	-	1	2,000	2,000	-	2,000
TZA	LD, C	3,905	-	-	3,905	3,905	3,905	-	3,905
YEM	LD, C	26,262	-	-	18,134	26,262	26,262	-	26,262
ZAF	DG, C	2,000	-	-	308	2,000	2,000	-	2,000

**Status:** LD = least developed, DG = developing, DD = developed country, S = small islands developing state, C = coastal state, DW = distant water fishing nation  
 Calculated annual catch limit differs from base annual limit

**Table A5:** Annual catch limits (columns *e*, *h*) for CPCs subject to Res. 21/01 for the years 2022 (calculated) and 2023 (estimated).

Catches for 2022 (column *f*) estimated to the same exact level of catch limits calculated for 2021 (column *e*).



## Appendix 4 – best scientific estimates of YFT nominal catches (all fisheries combined, 2014-2021)

CPC	Status	2014	2015	2016	2017	2018	2019	2020	2021	Trend
AUS	DD, C	20	73	67	66	39	46	18	18	
BGD	LD, C	0	0	0	0	0	0	2	142	
CHN	DG, DW	13363	15714	18770	12077	15486	12640	12781	12570	
COM	LD, S, C	1399	1748	5584	4806	3194	5279	6745	3770	
ERI	LD, C	0	0	0	0	0	0	0	0	
EU	DD, DW	92504	87157	88249	87686	78877	72501	71800	76040	
FRA	DD, C	0	0	0	0	0	0	0	0	
GBR	DD, DW	88	87	44	23	13	17	8	0	
IDN~	DG, C	45122	40571	36485	39910	40306	41483	44471	57106	
IND	DG, C	33427	17159	19244	13932	37488	33554	20795	24515	
IRN	DG, C	46216	42599	45110	56121	58650	58044	48314	44280	
JPN	DD, DW	4072	3478	3389	4003	3382	2597	2083	931	
KEN	DG, C	71	108	108	404	3592	3654	3563	3641	
KOR	DG, DW	10409	9183	11721	8164	6990	10790	3687	6208	
LKA	DG, C	37778	32673	33735	37977	39817	44756	37013	31318	
MDG	LD, C	735	747	736	703	704	715	709	704	
MDV	DG, S, C	49212	52439	53705	49361	47217	44702	42705	24548	
MOZ	LD, C	5	69	174	168	155	269	301	358	
MUS	DG, S, C	4908	5530	7585	8017	11656	12684	9779	9711	
MYS	DG, C	77	144	156	384	446	428	374	391	
OMN	DG, C	7208	15183	20983	19499	28837	37033	68785	75080	
PAK	DG, C	16441	18817	25560	27784	18384	9358	7919	8470	
PHL	DG, DW	69	0	0	73	0	0	0	0	
SDN	LD, C	0	0	0	0	0	0	0	0	
SOM	LD, C	0	0	0	0	0	0	0	0	
SYC	DG, S, C	25079	41468	43261	46099	42069	43755	39603	34101	
THA	DG, C	187	109	0	0	0	0	0	1	
TZA	LD, C	3441	4011	4013	3904	3904	3905	3905	3905	
YEM	LD, C	29180	24518	21253	18061	18077	18110	18134	18134	
ZAF	DG, C	83	182	183	247	331	389	217	308	

Catch data 2014-2021 from IOTC best scientific estimates

~ Catch data 2014-2020 from National Reports (IOTC-2021-SC24-NR09 and previous), catch data 2021 from form 1-RC

CPCs objecting to Res. 21/01

Table A6: Annual catches of yellowfin tuna by CPC and year (2014-2021)