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MANAGEMENT OBJECTIVES AND ACCEPTABLE LEVELS OF EXPLOITATION FOR THE TROPICAL TUNA STOCKS - DISCUSSION PAPER

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MANAGEMENT OBJECTIVES AND ACCEPTABLE LEVELS OF EXPLOITATION FOR THE TROPICAL TUNA STOCKS

Discussion Paper
Prepared by the United States of America
for the
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This paper contains two parts, both related to workshop agenda item 3. The first is on management objectives and the second is on setting allowable levels of exploitation that stem from those objectives.

1. Management Objectives

1.1 Explanatory note

Suggested below is a new set of management objectives for inclusion in the tropical tunas measure, including a general qualitative objective for the measure as a whole, and quantitative objectives for each of the three tropical tunas stocks. The latter objectives are sufficient to formulate specific management measures for the fisheries. The basis for the specific objectives is as follows:

For skipjack tuna, the Commission has an interim target reference point, which is an appropriate and sufficient objective (noting that it is under reconsideration and subject to change).

For bigeye tuna and yellowfin tuna, the Commission has limit reference points (LRPs) but not target reference points (TRPs). The objectives in the existing measure are not related to the LRPs, but rather are precautionary benchmarks intended as temporary objectives until TRPs are adopted. We suggest shifting away from those temporary benchmarks to objectives that are based on the risk of breaching the LRPs. This is consistent with the approach being taken in developing TRPs for the two stocks, and would help set the stage for adopting TRPs in 2021 or later. The adoption of specific LRP risk levels in the measure is sufficient to inform the development or adjustment of specific management measures for the relevant fisheries.[1]

As specified in the Convention, management measures should be designed such that the risk of breaching LRPs is "very low". The meaning of "very low" depends on the magnitude of the associated LRP—that is, how conservative it is. The Commission's LRPs are quite conservative, as noted by the Scientific Committee (paragraph 103 of the report of SC12):

[1] The Commission could consider translating the risk levels into associated stock sizes, but that step is not needed to fully inform the development of specific management measures.

… SC12 recommended that WCPFC13 notes that levels of risk for breaching LRP should be considered coupled with the corresponding conservative or liberal nature of the LRP. For example, the bigeye tuna LRP (20% of unfished spawning biomass) is very close to the depletion expected to occur (0.21) if the fishery attained the spawning biomass at MSY. Therefore the bigeye tuna LRP is viewed as conservative and could have associated higher levels of risk for breaching the LRP.

According to the scientific service provider's most recent analyses to inform discussions on candidate target reference points (WCPFC17-2020-12_rev1), an LRP risk level of 20% is associated with a depletion level for WCPO bigeye tuna of 29-33% unfished SSB (depending on recruitment conditions). In comparison, the most recent stock assessment indicates that SSB_{MSY} is about 23% unfished SSB (the mean of the 24 models in the structural uncertainty grid) (SC16-SA-WP-03).

For WCPO yellowfin tuna, an LRP risk level of 10% is associated with a depletion level of about 31% unfished SSB (analyses were not attempted at the 20% risk level because "significantly greater levels of future purse seine and longline fishing were required to drive the stock to levels where risk increased"). In comparison, the most recent stock assessment indicates that SSB_{MSY} is about 23% unfished SSB (the mean of the 72 models in the structural uncertainty grid) (SC16-SA-WP-04).

Thus, for both bigeye tuna and yellowfin tuna, an LRP risk level as high as 20% would be expected to result in stock sizes considerably larger than those associated with MSY.

As a comparative example, the IATTC has adopted LRPs for the tropical tuna stocks in the eastern Pacific ocean that correspond to depletion levels of about 8% unfished SSB (IATTC Resolution C-16-02). This is a much lower level than the WCPFC LRPs of 20% unfished SSB, and thus should be accompanied by lower levels of risk.

In conclusion, an LRP risk level of 20% is very low and appropriately cautious for all three tropical tuna stocks,[2] and it is a suitable management objective for bigeye tuna and yellowfin tuna until TRPs are adopted.

[2] Further information to support this conclusion is available in WCPFC13-2016-DP23.

1.2 Suggested objectives for CMM 2021-01

General objective

This measure is intended and designed to support thriving fisheries for skipjack tuna, bigeye tuna, and yellowfin tuna in the Convention Area, and to do so in a way that is fair to all members and addresses the special requirements of developing States and participating territories. The measure's provisions are based on the stock-specific objectives below, as well as other relevant provisions of the Convention and decisions of the Commission. As the harvest strategies for the tropical tuna stocks and/or their associated fisheries are developed, the objectives and provisions of the measure will be amended accordingly.

Specific objectives

WCPO skipjack tuna: The spawning biomass is to be maintained, on average, at a level consistent with the interim target reference point.

WCPO bigeye tuna: Fishing mortality is to be limited such that the risk of breaching the limit reference point is no greater than 20 percent.

WCPO yellowfin tuna: Fishing mortality is to be limited such that the risk of breaching the limit reference point is no greater than 20 percent.

2. Acceptable Levels of Exploitation

2.1 Explanatory note

Table 1 includes several management scenarios, expressed in terms of longline and purse seine exploitation levels relative to 2016-2018 average fishing patterns. Because the risk of breaching the LRP is greater for bigeye tuna than for yellowfin tuna, the scenarios are based on the risk for bigeye tuna, and they include risk levels from 5% to 20%. The management objective suggested in the first part of this paper, a 20% LRP risk level for bigeye tuna, is highlighted in bold font. Also shown are the expected outcomes if the current CMM (2018-01 or 2020-01) were continued (assuming the optimistic and "recent" recruitment scenarios).

Under all the LRP risk levels for bigeye tuna, from 5% to 20%, there is room for an increase in bigeye tuna and yellowfin tuna exploitation relative to both the 2016-2018 baseline and CMM 2018-01 levels. WCPFC17-2020-16 provides information that can be used to evaluate various combinations of exploitation adjustments in the longline and purse seine sectors. Given the Scientific Committee's advice to reduce mortality in fisheries that take juvenile bigeye tuna,[3] we suggest that exploitation of bigeye tuna by purse seine not be increased from the level expected under CMM 2018-01. Thus, in Table 1, for all management scenarios, the purse seine scalar is specified as 1.11, the level associated with CMM 2018-01. The longline scalar accordingly increases as the LRP risk for bigeye tuna increases.

In Table 2, the scalars for each of the management scenarios in Table 1 are converted into catches for longline and sets for purse seine, using the information available in WCPFC17-2020-16a.

[3] SC16 paragraph 97: *SC16 noted that levels of fishing mortality and depletion differ among regions, and that fishery impact was higher in the tropical regions (Regions 3, 4, 7 and 8 in the stock assessment model), with particularly high fishing mortality on juvenile bigeye tuna in these regions. There is also evidence that the overall stock status is buffered with biomass kept at more elevated level overall by low exploitation in the temperate regions (1, 2, 6 and 9). SC16 therefore re-iterates that WCPFC17 could continue to consider measures to reduce fishing mortality from fisheries that take juveniles, with the goal to increase bigeye fishery yields and reduce any further impacts on the spawning biomass for this stock in the tropical regions.*

Table 1. Bigeye tuna and yellowfin tuna LRP risk levels and stock sizes under various management scenarios.

	PS scalar	LL scalar	Bigeye tuna		Yellowfin tuna	
			Risk of breaching LRP	Expected stock size $SB_{2048}/SB_{F=0}$	Risk of breaching LRP	Expected stock size $SB_{2048}/SB_{F=0}$
2016-2018 baseline (recent BET R)	1	1	0%	0.48	0%	0.59
CMM 2018-01 (opt; recent BET R)	1.11[a]	1[a]	0%[b]	0.47[b]	0%	0.58
5% BET risk	1.11	1.8	5%	0.35	0%	0.54
10% BET risk	1.11	2.0	10%	0.32	0%	0.53
15% BET risk[c]	1.11	>2.0	15%	<0.32	?	<0.53
20% BET risk[c]	**1.11**	**>2.0**	**20%**	**0.29**	**?**	**<0.53**

- The estimates for the 2016-2018 baseline and CMM 2018-01 are from WCPFC17-2020-14_rev1.
- The estimates for the other management scenarios are from WCPFC17-2020-12_rev1 and WCPFC17-2020-16.
- Additional indicators of fishery performance under various management scenarios are available in WCPFC17-2020-12_rev1.

[a] For reference, the "pessimistic" PS and LL scalars for CMM 2018-01 are 1.13 and 1.51, respectively.

[b] For reference, under the "long-term" BET recruitment "optimistic" scenarios, CMM 2018-01 is expected to result in an LRP risk level for bigeye tuna of 6% and a bigeye tuna stock size of 0.42.

[c] The scalars in WCPFC17-2020-16 do not go beyond 2.0, so the longline scalars and associated bigeye tuna and yellowfin tuna stock sizes for the 15% and 20% BET LRP risk scenarios are not known.

Table 2. Purse seine and longline exploitation levels under various management scenarios.

	PS scalar	LL scalar	Bigeye tuna LL catch (mt/yr)	Yellowfin tuna LL catch (mt/yr)	PS associated effort (sets/yr)	PS unassoc. effort (sets/yr)
2016-2018 baseline (recent BET R)	1	1	59,312	67,653	15,075	29,399
CMM 2018-01 (opt; recent BET R)	1.11	1	59,312	67,653	16,583	32,339
5% BET risk	1.11	1.8	106,762	121,775	16,583	32,339
10% BET risk	1.11	2.0	118,625	135,306	16,583	32,339
15% BET risk[a]	1.11	>2.0	>120,000	>136,000	16,583	32,339
20% BET risk[a]	**1.11**	**>2.0**	**>120,000**	**>136,000**	**16,583**	**32,339**

[a] The scalars in WCPFC17-2020-16a do not go beyond 2.0, so the longline scalars and associated bigeye tuna and yellowfin tuna annual catches for the 15% and 20% BET LRP risk scenarios are not known.

2.2 Suggested allowable levels of exploitation in CMM 2021-01

Longline

Allowable exploitation of bigeye tuna by longline is limited to 120,000 mt per year.

Purse seine

Allowable exploitation of bigeye tuna by purse seine is limited to the level expected from 17,000 associated sets and 32,000 unassociated sets per year.