



WCPO PS Tuna FIP - Current Harvest Strategies and Timeline Review

Outline: This harvest strategy document aims to compile and analyse current Harvest Strategies and timelines for each of the tuna species in this FIP to understand their current and future status.

Introduction: The current FIP is comparatively broad in scope. Encompassing fishing of skipjack, bigeye and yellowfin tuna caught in the Western Central Pacific by purse seine gear associated with FAD and FAD-free fishing. This implies that the current harvest strategy analysis falls under WCPFC governance, and not a single nation state fishing operation(s). Unless otherwise stated, all data utilised in this analysis pertains to the WCPFC area of operation.

Overview of current Harvest Strategies under WCPFC CMMs and timelines for Skipjack, Bigeye and Yellowfin tuna in WCPFC

WCPFC Conservation Management Measure (CMM 2014-06), along with its subsequent updates, commits WCPFC in developing and implementing a formal harvest strategy for key fishery species, including the 3 species in this FIP. The initial timeline set out in CMM 2014-06 to meet key targets was not achieved, and subsequently revised in CMM 2018-01 to amend the timeline ‘pending the establishment of Harvest Strategies, and any implementing CMM, the purpose of this measure is to provide for a robust transitional management regime that ensures the sustainability of bigeye, skipjack and yellowfin tuna stocks’ (see separate Gantt chart)

Specifically the purpose of CMM 2018-01 is to ‘create a bridge to the adoption of Harvest Strategies for bigeye, skipjack and yellowfin tuna stocks and/or fisheries in accordance with indicative timeframes set out in the Agreed Work Plan for the Adoption of Harvest Strategies under CMM 2014-06, which includes the development of management objectives and reference points’.

CMM 2018-01 further sets up capacity management measures in the tropical tuna fishery to restrict fishing effort, including the 3 species addressed here, with focus on the purse seine fishery (and longline). Measures included are a three-month (July-September) prohibition of deploying, servicing or setting on FADs, including the high seas and EEZs, in the area 20°N-20°S (under specific approval, excluding some exemptions for PNA vessels operating under the Vessel Day Scheme); A flag CMM shall ensure that each of its purse seine vessels shall have deployed at sea, at any one time, no more than 350 FADs with activated instrumented buoys; and zone-based and high seas effort and control.

Looking forward, WCPFC16 will take place between December 5-11, 2019. Respective to the FIP, the commission will prepare the following meeting papers and working documents, ‘Reference Document for the Review of CMM 2018-01 and Development of Harvest Strategies (Bigeye, Skipjack and Yellowfin Tunas); Current and projected stock status of WCPO skipjack tuna to inform consideration of an updated Target Reference Point, and; Minimum Target Reference Points for WCPO yellowfin and bigeye tuna consistent with alternative LRP risk levels, and multispecies implications (update of SC15-MI-WP01). These discussions will further progress the Harvest Strategies and timelines addressed in this FIP to ideally meet current timelines set forth in CMM 2014-06 (updated 2018).

The following of this document breaks down the harvest strategy employed by WCPFC for the 3 tuna species this FIP is addressing, with the latest information accessible at time of writing. This has been produced by analysing the key elements of the ‘planned’ harvest strategy employed by WCPFC. These elements include, a. Defined operational objectives; b. Target and limit reference points for each stock; c. Acceptable levels of risk of not breaching limit reference points; d. A monitoring strategy using best available information to assess performance against reference points; e. Decision rules that aim to achieve the Target Reference Point and aim to avoid the limit reference point, and; f. An evaluation of the performance of the proposed Harvest Control Rules against management objectives, including risk assessment.

To reduce repetition within the document, Harvest Strategy elements that are the same between species have only been listed once and referenced back to.



1. Skipjack (*Katsuwonus pelamis*)

a) Defined operational objectives, including timeframes, for the fishery or stock ('management objectives')

Currently, for Skipjack, Bigeye and Yellowfin Tuna stocks in WCPO, CMM 2014-06 has been supplemented with CMM 2018-01 (as described earlier).

The most recent updated timeframe for CMM 2014-06 states that in 2019, development of Harvest Control Rules and a management strategy evaluation will be undertaken (pending ongoing advice from SC on candidate HCR) within the year. Looking forward, 2020 follows on from 2019 with a plan of adoption of HCRs. 2021 intends to have a Harvest Strategy in place for skipjack dependent on 2020 progress (WCPFC15 summary report, 2019).

b) Target and limit reference points ('reference points')

Currently there is no formal Target Reference Point for skipjack outlined in WCPFC documents, but a Limit Reference Point of $20\%SB_{current, F=0}$, where 'current' is defined as the most recent ten-year period for which data is available for the stock assessment. However, at present, while TRPs are in development there is an Interim Harvest Strategy, which states that 'The spawning biomass of skipjack tuna is to be maintained on average at a level consistent with the interim Target Reference Point of 50% of the spawning biomass in the absence of fishing adopted in accordance with CMM 2014-06' (CMM 2015-06). This current measure is expected to ensure that F and SB remain at appropriate levels, supported by the current stock status and business as usual projections (see McKechnie et al, 2016; Vincent et al., 2019).

c) Acceptable levels of risk of not breaching limit reference points ('acceptable levels of risk')

WCPFC Management Objective Workshop, MOW3 WP/02, outlines risk as 'the % of times a population is predicted to be below the LRP when projecting into the future under a particular management strategy.' At WCPFC13 (in 2016), no greater than a 20% chance of breaching the limit reference point was agreed upon. At present, based on the most recent stock assessments for all 3 tuna species, the current level of SB/SB_{F=0} are above the minimum TRP levels estimated for the four levels of acceptable risk (5, 10, 15 and 20% acceptable risk) (updated CMM 2018-01, 2019). Furthermore, the estimates for F/F_{MSY} are also estimated to be below the maximum values consistent with all four levels of risk (CMM 2018-01, 2019).

d) A monitoring strategy using best available information to assess performance against reference points ('monitoring strategy')

Under CMM 2014-06, 'For each fishery or stock with an established harvest strategy, the Scientific Committee and other relevant subsidiary bodies, as appropriate, shall periodically evaluate the performance of the fishery or stock against the agreed operational management objectives (as specified through the reference points and Harvest Control Rules). The Scientific Committee shall report its findings and advice to the Commission.'

e) Decision rules that aim to achieve the Target Reference Point and aim to avoid the limit reference point ('Harvest Control Rules')

Currently formal Harvest Control Rules are not in place for this skipjack stock. However, WCPFC have an agreed, legally binding framework in place to establish formal Harvest Strategies and control rules for their main stocks, including WCPO yellowfin (see CMM 2014-06). As part of the 2018 update (Work plan for the adoption of Harvest Strategies under CMM 2014-06 timeframe), 'Develop Harvest Control Rules' are on the 2019 agenda.

As noted earlier, measures included are a three-month (July-September) prohibition of deploying, servicing or setting on FADs, including the high seas and EEZs, in the area 20°N-20°S (under specific approval, excluding some exemptions for PNA vessels operating under the Vessel Day Scheme); A flag CMM shall ensure that each of its purse seine vessels shall have deployed at sea, at any one time, no more than 350 FADs with activated instrumented buoys; and zone-based and high seas effort and control. Limits may be exceeded by a CCM or group of CCMs, CMM 2018-01 further states that they will be deducted from the limits for the following year (Table 1).



Table 1. Purse seine effort/catch limits under CMM 2018-01 (* = limits not notified to the Commission, ** = The United States notified the Secretariat of the combined US EEZ and high seas effort limits on 1 July 2016 (1828 fishing days on the high seas and in the U.S. EEZ (combined)). Source: CMM 2018-01 attachment 1.

Costal CCM or group of CCMs	High Seas purse seine effort limit (days)	Zone-based purse seine effort control/catch limit in tonnes
PNA	N/A	44,033 days
Tokelau	N/A	1000 days
Cook Islands	N/A	1250 days
Fiji	N/A	300 days
Niue	N/A	200 days
Samoa	N/A	150 days
Tonga	N/A	250 days
Vanuatu	N/A	200 days
Australia	N/A	30,000 mt SKJ; 600 mt BET; 600 mt YFT
French Polynesia	N/A	0
Indonesia	0	*
Japan	121	1500 days
Korea	N/A	*
New Zealand	N/A	40,00 mt SKJ; nothing specified for other species
New Caledonia	N/A	20,000 mt; nothing specified for other species
Philippines	Separate measures for Philippines, see CMM 2018-01	*
Taiwan	95	*
USA	1270	558 days
Wallis and Futuna	N/A	*
China	26	N/A
EU	403	N/A
Ecuador	Subject to CNM on participatory rights	N/A
El Salvador	Subject to CNM on participatory rights	N/A

f) An evaluation of the performance of the proposed Harvest Control Rules against management objectives, including risk assessment (‘management strategy evaluation’).

As stated in the Third Management Objective workshop, ‘once we have some HCRs in place, we can evaluate how certain risk levels perform in terms of catch, catch variability, and catch rates (related to the management objectives). We can also examine the impacts and risk of what happens when we get things wrong (e.g. within the assessment, a failure to take into account the effects of effort creep)’ (MOW3 WP-02).

In the updated CMM 2014-06 (2018), with reference to skipjack, ‘Management Strategy Evaluation’ has been on the agenda since 2017 and will last through to 2019, whereby after there is an anticipated Harvest Strategy that will be in place for the skipjack stock. With this being the current status, a full evaluation at this stage is not feasible.



2. *Bigeye (Thunnus obesus)*

a) **Defined operational objectives, including timeframes, for the fishery or stock ('management objectives')**

The past management objectives for the Bigeye in WCPO area focused heavily on rebuilding the stock after the Commission tasked SC to determine a biologically reasonable timeframe for rebuilding Bigeye to its LRP (WCPFC12 summary report, attachment Y). In 2018 the CCPFC15 summary report (Issued May 2019) after stochastic bigeye stock projections (with business as usual and different fishing level scenarios) (McKechnie et al, 2016), indicated that if the recent positive recruitments continue, the bigeye stock will achieve the aims of the CMM. Following the updated stock status, the current workplan for Bigeye in 2019 involves the agreement on a TRP (pending SC advice); 2020 involves developing Harvest Control Rules and a management strategy evaluation; while 2021 involves the same as 2020 with the outcome of adopting a harvest control rule

b) **Target and limit reference points for each stock ('reference points')**

Interim Harvest Strategy: 'Pending agreement on a Target Reference Point the spawning biomass depletion ratio (SB/SB F=0) is to be maintained at or above the average SB/SB F=0 for 2012-2015.' (CMM 2018-01) Bigeye, under the Work plan for the adoption of Harvest Strategies under CMM 2014-06 (2018 update), plans to have agreed TRPs in 2019 (initially 2018), pending the SC advice given on the potential TRPs.

c) **Acceptable levels of risk of not breaching limit reference points ('acceptable levels of risk')**

As per skipjack in Section 2.c

d) **A monitoring strategy using best available information to assess performance against reference points ('monitoring strategy')**

As per skipjack in Section 2.d

e) **Decision rules that aim to achieve the Target Reference Point and aim to avoid the limit reference point ('Harvest Control Rules')**

Likewise, to Skipjack, formal Harvest Control Rules are not in place for this Bigeye stock. However, WCPFC have an agreed, legally binding framework in place to establish formal Harvest Strategies and control rules for their main stocks, including WCPO yellowfin (see CMM 2014-06). As part of the 2018 update (Work plan for the adoption of Harvest Strategies under CMM 2014-06 timeframe), 'Develop Harvest Control Rules' are on the 2020 agenda (after developing a TRP in 2019).

The same harvest control rules are currently in place for bigeye as that indicated in the skipjack section 2.e

f) **An evaluation of the performance of the proposed Harvest Control Rules against management objectives, including risk assessment ('management strategy evaluation').**

As per skipjack in Section 2.f (albeit with different timeframes-as outlined in the separate Gantt chart)



3. *Yellowfin (Thunnus albacares)*

a) Defined operational objectives, including timeframes, for the fishery or stock

As per bigeye in Section 3.a

b) Target and limit reference points for each stock ('reference points')

At present yellowfin does not have a formal TRP and relies upon the Interim Harvest strategy: 'Pending agreement on a Target Reference Point the spawning biomass depletion ratio (SB/SB F=0) is to be maintained at or above the average SB/SB F=0 for 2012-2015' (CMM 2015-06).

Yellowfin under the work plan for the adoption of Harvest Strategies under CMM 2014-06 (2018 update) follows the same adoption plan timeline as Bigeye, the work plan for the Adoption of Harvest Strategies outlined in CMM 2014-06 (2018 update). There are plans to have agreed TRPs in 2019 (initially 2018), pending the SC advice given on the potential TRPs.

c) Acceptable levels of risk of not breaching limit reference points ('acceptable levels of risk')

As per skipjack in Section 2.c

d) A monitoring strategy using best available information to assess performance against reference points ('monitoring strategy')

As per skipjack in Section 2.d

e) Decision rules that aim to achieve the Target Reference Point and aim to avoid the limit reference point ('Harvest Control Rules')

As per Bigeye in Section 3.e

f) An evaluation of the performance of the proposed Harvest Control Rules against management objectives, including *risk* assessment ('management strategy evaluation').

For yellowfin tuna, results under the 2013-15 average and 'optimistic' scenarios are comparable, with the stock stabilising at 33% SB/SBF=0 (a 1% decrease from recent assessed levels) and F/F_{MSY} reducing to 0.68 (a 7-8% reduction). The pessimistic scenario, which implies a 35% increase in longline yellowfin catch, had a greater impact, with yellowfin biomass falling to 30% SB/SBF=0 (an 8% reduction from recent levels), F/F_{MSY} remaining stable at 0.73 F/F_{MSY} , and the risk of breaching the adopted limit reference point increasing to 16%. The aims of CMM 2017-01 for yellowfin (maintain at recently assessed levels) do not appear to be met under the pessimistic scenario (wcpfc15-2018-12_REV 2).

A Gantt chart is available as a supplement to this document.



References

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