REVIEW OF CONSERVATION AND MANAGEMENT MEASURES RELATING TO TROPICAL TUNAS

PREPARED BY: IOTC SECRETARIAT, 11 MAY 2022

PURPOSE

To encourage participants at the Working Party on Tropical Tunas (WPTT24) Data Preparatory Meeting to review the existing Conservation and Management Measures (CMM) relevant to the three tropical tuna species; and as necessary to 1) provide recommendations to the Scientific Committee on whether modifications may be required; and 2) recommend whether other CMMs may be required.

BACKGROUND

Tropical tunas in the Indian Ocean are currently subject to several CMMs adopted by the Commission, including:

Resolution 03/01 *On the limitation of fishing capacity of Contracting Parties and Cooperating Non-Contracting Parties*. This Resolution requires Contracting Parties and Cooperating Non-Contracting Parties (CPCs) which have more than 50 vessels on the 2003 IOTC Record of Vessels, shall limit in 2004 and following years, the number of their fishing vessels larger than 24 meters length overall (hereafter LSFVs) to the number of its fishing vessels registered in 2003 in the IOTC Record of Vessels.

Resolution 05/01 *On Conservation and Management Measures for bigeye tuna*. This Resolution limits CPC catches of bigeye tuna to recent levels reported by the IOTC Scientific Committee. It also limits, by a non-binding request, Taiwan, Province of China to limit their annual bigeye tuna catch in the IOTC area of competence to 35,000 tonnes.

Resolution 14/02 *For the conservation and management of tropical tunas stocks in the IOTC area of competence***.** This Resolution removes obsolete and ineffective elements from the previous Resolution 12/13, in particular the month long closed area following advice from the Scientific Committee that the current closure is likely to be ineffective, as fishing effort will be redirected to other fishing grounds in the Indian Ocean. The positive impacts of the moratorium within the closed area would likely be offset by effort reallocation, as they will result in similar catch rates and total annual catches. In addition, the area closure includes not only the high seas but also part of the EEZ of Somalia, which may be detrimental to the aspirations of Somalia with respect to granting of fishing rights within its EEZ. The revised Resolution retains only those elements related to the already established process for an allocation system or any other relevant measures to be developed to manage tropical tuna stocks.

Resolution 16/02 *On harvest control rules for skipjack tuna in the IOTC Area of Competence*. The Resolution implements a Harvest Control Rule (HCR) for Indian Ocean Skipjack tuna, based on SC recommendations, including the new guidance on reference points in cases where MSY-based reference points are difficult to estimate. The Resolution uses the biomass limit reference point of 20% of the unfished level (BLIM = 0.2B0) and the target biomass reference point of 40% of the unfished level (BTARG = 0.4B0), consistent with the SC advice that reference points based on depletion level should be used for stocks where MSY-based reference points cannot be robustly estimated and with international conventions and current practices followed in other tRFMOs.

Resolution 19/02 *Procedures on a Fish Aggregating Devices (FADS) Management Plan.* This Resolution applies to CPCs CPCs having purse seine vessels and fishing on Drifting Fish Aggregating Devices (DFADs), equipped with instrumented buoys for the purpose of aggregating target tuna species, in the IOTC area of competence. Only purse seiners and associated supply or support vessels are allowed to deploy DFADs in the IOTC Area of Competence. This Resolution sets the maximum number of operational buoys followed by any purse seine vessel at 300 at any one time. The number of instrumented buoys that may be acquired annually for each purse seine vessel is set at no more than 500. No purse seine vessel shall have more than 500 instrumented buoys (buoy in stock and operational buoy) at any time. It further provides guidelines for preparation of drifting fish aggregating device (DFAD) management plans, guidelines for preparation of anchored fish aggregating device (AFAD) management plans and principles for design and deployment of FADs including FAD marking, tracking and recovery.

Resolution 21/01 *On an Interim Plan for Rebuilding the Indian Ocean Yellowfin Tuna Stock in the IOTC Area of Competence*. This Resolution requires CPCs to reduce their catch of yellowfin tuna. For CPCs whose catches of yellowfin reported for 2014 were above 5000t must reduce their catches of yellowfin by 21 % from the 2014 levels. Coastal states are required to reduce catches by 12% and Small Island Developing States or Least Developed States by 10% compared to 2014 levels. For CPCs with catches of yellowfin tuna in 2014 less than 5000t and their average catches of yellowfin tuna for the period from 2017 to 2019 inclusive, were above 5000t, shall reduce their catches of yellowfin tuna by 21% compared to 2014 yellowfin tuna catch. Exceptions apply to the aforementioned limits as stipulated in the Resolution. The Resolution further stipulates conditions for over catches of the annual limits, reduction in the number of supply vessels and additional requirements for gillnets.

Resolution 21/03 *On Harvest Control Rules for skipjack tuna in the IOTC area of competence*. This Resolution for a Harvest Control Rule (HCR) for skipjack draws on SC recommendations, including the guidance on reference points. It uses the biomass limit reference point of 20% of the unfished level (BLIM = 0.2B0) and the target biomass reference point of 40% of the unfished level (BTARG = 0.4B0), consistent with the SC advice that reference points based on depletion level should be used for stocks where MSY-based reference points cannot be robustly estimated. In addition the Resolution provides guidance on the HCR and incorporates a review and the concept of exceptional circumstances.

DISCUSSION

As part of best practice, the WPTT is obliged to review existing CMMs and consider whether their science-based components need to be updated. If this is the case, then the WPTT should provide clear, science-based recommendations for the Scientific Committee's consideration.

RECOMMENDATION

That the WPTT **NOTE** paper IOTC–2022–WPTT24–05 which aims to encourage the WPTT to review the existing Conservation and Management Measures (CMMs) relevant to tropical tunas, and as necessary to 1) provide recommendations to the Scientific Committee on whether modifications may be required; and 2) recommend whether other CMMs may be required.

APPENDICES

Appendix A: Resolution 03/01 *On the limitation of fishing capacity of Contracting Parties and Cooperating Non-Contracting Parties.*

Appendix B: Resolution 05/01 *On Conservation and Management Measures for bigeye tuna.*

Appendix C: Resolution 14/02 *For the conservation and management of tropical tunas stocks in the IOTC area of competence*

Appendix D: Resolution 16/02 *On harvest control rules for skipjack tuna in the IOTC Area of Competence.*

Appendix E: Resolution 19/02 *Procedures on a Fish Aggregating Devices (FADS) Management Plan.*

Appendix F: Resolution 21/01 *On an Interim Plan for Rebuilding the Indian Ocean Yellowfin Tuna Stock in the IOTC Area of Competence*

Appendix G: Resolution 21/03 *On Harvest Control Rules for skipjack tuna in the IOTC area of competence*

APPENDIX A

RESOLUTION 03/01

ON THE LIMITATION OF FISHING CAPACITY OF CONTRACTING PARTIES AND COOPERATING NON-CONTRACTING PARTIES

The Indian Ocean Tuna Commission (IOTC),

RECALLING the adoption of FAO Agreement to Promote Compliance with International Conservation and Management Measures by Fishing Vessels on the High Seas;

RECOGNISING that paragraph 1 of the Resolution 99/1: 'On the Management of Fishing Capacity and on the Reduction of the Catch of Juvenile Bigeye Tuna by Vessels, including Flag of Convenience Vessels, Fishing for Tropical Tunas in the IOTC area of competence', adopted at the 4th Session of the Commission, stipulate that the 2000 IOTC Session would consider the limitation of the capacity of the fleet of large-scale tuna vessels (greater than 24 m LOA) to the appropriate level;

RECALLING the adoption by IOTC in 2001 of the Resolution 01/04 [superseded by Resolution 14/01] on limitation of fishing effort of non-Members of IOTC whose vessels fish bigeye tuna;

RECOGNISING that the IOTC Scientific Committee recommended that a reduction in catches of bigeye tuna from all gears should be implemented as soon as possible; that the stock of yellowfin tuna is being exploited close to, or possibly above MSY; and that the level of fishing effort of swordfish should not be increased;

RECOGNISING that FAO International Plan of Action for the Management of the Fishing Capacity (IPOA) provides, in its Objectives and Principles that "States and Regional Fisheries Organisations confronted with an overcapacity problem, where capacity is undermining achievement of long-term sustainability outcomes, should endeavour initially to limit at present level and progressively reduce the fishing capacity applied to affected fisheries";

TAKING INTO ACCOUNT the need to have due regard for the interests of all Members concerned, in conformity with the rights and obligations of those Members under international law and in particular, to the rights and obligations of developing countries of the Indian Ocean rim with respect to entry into the high-seas fisheries in the IOTC area of competence;

ADOPTS, in accordance with the provisions of Article IX, paragraph 1 of the Agreement establishing the IOTC, that:

1. Contracting Parties and Cooperating Non-Contracting Parties (CPCs) which have more than 50 vessels on the 2003 IOTC Record of Vessels, shall limit in 2004 and following years, the number of their fishing vessels larger than 24 meters length overall (hereafter LSFVs) to the number of its fishing vessels registered in 2003 in the IOTC Record of Vessels[1].

2. This limitation of number of vessels shall be commensurate with the corresponding overall tonnage expressed in GRT (Gross Registered Tonnage) or in GT (Gross Tonnage) and, where vessels are replaced, the overall tonnage shall not be exceeded.

3. Other CPCs which have the objective of developing their fleets above those authorisations currently foreseen under administrative processes, will draw up, a fleet development plan in accordance with the provisions of Resolution 02/05 [superseded by Resolution 05/02, then Resolution 07/02, then Resolution 13/02, then Resolution 14/04, then by Resolution 15/04]. This Plan shall be submitted to the Commission for information and record at the 2004/05 Sessions and should define, *inter alia*, the type, size and origin of the vessels and the programming of their introduction into the fisheries.

4. In relation to the foregoing, the Commission took note of the interests of the developing coastal States, in particular small island developing States and territories within the IOTC Convention Area [area of competence] whose economies depend largely on fisheries.

[1] Including authorisations currently foreseen under administrative process

APPENDIX B

RESOLUTION 05/01
ON CONSERVATION AND MANAGEMENT MEASURES FOR BIGEYE TUNA

The Indian Ocean Tuna Commission (IOTC),

RECOGNISING the need for action to ensure the achievement of the IOTC's objectives to conserve and manage tuna and tuna-like species in the IOTC area of competence;

RECALLING the adoption by IOTC of Resolution 01/04, [superseded by Resolution 14/01] in relation to the limitation of fishing capacity on bigeye tuna of Contracting Parties and Cooperating Non-Contracting Parties (CPC's);

ACKNOWLEDGING that the limitation of fishing capacity alone will not be sufficient to limit effort or total catch of tuna and tuna-like species, particularly bigeye tuna;

AWARE that due to illegal activity and underestimation of the total mortality of bigeye tuna the current assessment of the status of the stock is likely to be overly optimistic;

RECOGNISING that the IOTC Scientific Committee has recommended that a reduction in the catches of bigeye tuna from all fishing gears should be implemented as soon as possible;

ADOPTS, in accordance with paragraph 1 of Article IX of the IOTC Agreement, that:

1. Contracting and Cooperating Non-Contracting Parties (CPC's) shall limit their catch of bigeye tuna to their recent levels of catch reported by the IOTC Scientific Committee.

2. The Commission shall request Taiwan, Province of China to limit their annual bigeye tuna catch in the IOTC Area to 35,000 tonnes.

3. At the 10th Session of the Commission shall establish, for a three year period, interim catch levels for CPC's catching more than 1000t of bigeye tuna.

4. CPC's, including developing coastal states, in particular small island developing states and territories, with catches under 1000 tonnes who intend to substantially increase these catches will be allowed to submit 'Fleet Development Plans' during the 3 year interim period referred to in paragraph 3 above.

5. During this three year period the Commission shall develop a mechanism to allocate, for specific time periods, bigeye tuna quotas for all CPC's.

6. Future access to the tuna and tuna-like resources found within the area of competence of the IOTC will, in part, be determined on the level of responsibility shown by CPC's in relation to this measure.

7. The IOTC Scientific Committee be tasked to provide advice, including advice on;

   - the effects of different levels of catch on the SSB (in relation to MSY or other appropriate reference point);
   - the impact of misreported and illegal catch of bigeye tuna on the stock assessment and required levels of catch reduction; and
   - valuation of the impact of different levels of catch reduction by main gear types.

8. In relation to the foregoing, the Commission took note of the developing coastal states, in particular small island developing states and territories within the IOTC convention area [area of competence] whose economies depend largely on fisheries.

APPENDIX C

RESOLUTION 14/02

FOR THE CONSERVATION AND MANAGEMENT OF TROPICAL TUNAS STOCKS IN THE IOTC AREA OF COMPETENCE

The Indian Ocean Tuna Commission (IOTC),

RECOGNISING that based on past experience in the fishery, the potential production from the resource can be negatively impacted by excessive fishing effort;

TAKING INTO ACCOUNT the available scientific information and advice, in particular the IOTC Scientific Committee conclusions whereby the yellowfin tuna stock might have been over or fully exploited and the bigeye tuna stock may have been fully exploited in recent years; RECOGNISING that during the 12th IOTC scientific meeting held in Seychelles from 30 November to 04 December 2009, the IOTC Scientific Committee recommended that yellowfin tuna and bigeye tuna catches should not exceed the MSY levels which have been estimated at 300,000 tonnes for yellowfin tuna and at 110,000 tonnes for bigeye tuna;

ACKNOWLEDGING that the implementation of a TAC without a quota allocation would result in an inequitable distribution of the catches and fishing opportunities among the IOTC Members and Cooperating Non-Contracting Parties (CPCs) and non-CPCs;

FURTHER RECOGNISING that the tuna artisanal fisheries sector needs strengthening in terms of catch statistics reporting in order to more closely follow the catch situations and notwithstanding improvement in the industrial fishery catch statistics reporting requirements;

NOTING the importance of applying the precautionary approach for the management of the tropical tuna and swordfish stock, in particular yellowfin tuna and bigeye tuna in the Indian Ocean;

ADOPTS, in accordance with the provisions of Article IX, paragraph 1 of the IOTC Agreement, the following:

1. CPCs shall implement the following action plan:

    a) Establishment of an allocation system (Quota) or any other relevant measures based on the IOTC Scientific Committee recommendations for the main targeted species under the IOTC competence;

    b) Advise on the best reporting requirement of the artisanal tuna fisheries and implementation of an appropriate data collection system.

2. This Resolution supersedes Resolution 12/13 *For the conservation and management of tropical tunas stocks in the IOTC area of competence*.

APPENDIX D

RESOLUTION 16/02

ON HARVEST CONTROL RULES FOR SKIPJACK TUNA IN THE IOTC AREA OF COMPETENCE

Keywords: Skipjack tuna; Reference Points; Harvest Control Rules; Precautionary Approach; Management Strategy Evaluation.

The Indian Ocean Tuna Commission (IOTC),

NOTING Article V, paragraph 2(c), of the IOTC Agreement is to adopt, in accordance with Article IX and on the basis of scientific evidence, Conservation and Management Measures to ensure the conservation of the stocks covered by the Agreement;

BEING MINDFUL of Article XVI of the IOTC Agreement regarding the rights of Coastal States, Article 87 and 116 of the UN Convention of the Law of the Sea regarding the right to fish on the high seas and of Article 24 of the Agreement for the Implementation of the Provisions of the United Nations Convention of the Law of the Sea of December 1982 relating to the Conservation and Management of Straddling Fish Stocks and Highly Migratory Fish Stocks (UNFSA) regarding recognition of the special requirements of developing states;

RECOGNISING Resolution 12/01 *On the implementation of the precautionary approach* calls on the Indian Ocean Tuna Commission to implement and apply the precautionary approach, in accordance Article 6 of the Agreement for the Implementation of the Provisions of the United Nations Convention of the Law of the Sea of December 1982 relating to the Conservation and Management of Straddling Fish Stocks and Highly Migratory Fish Stocks (UNFSA);

RECOGNISING the ongoing discussions on allocation and the need to avoid prejudicing future decision of the Commission;

FURTHER CONSIDERING the call by the United Nations General Assembly Resolution 70/75 upon the states to increase the reliance on scientific advice in developing, adopting and implementing conservation and management measures and to take into account the special requirements of developing states, including Small Island developing States as highlighted in the SIDS Accelerated Modalities of Action (SAMOA) Pathway;

CONSIDERING the recommendations adopted by the KOBE II, held in San Sebastian, Spain, June 23 – July 3 2009; implementing where appropriate a freeze on fishing capacity on a fishery by fishery basis and such a freeze should not constrain the access to, development of, and benefit from sustainable tuna fisheries by developing coastal States;

TAKING INTO ACCOUNT the need to have due regard for the interests of all Members concerned, in conformity with the rights and obligations of those Members under international law and in particular, to the rights and obligations for developing countries;

RECALLING Article 6, paragraph 3(b) of UNFSA that calls on States to implement the precautionary approach using the best scientific information available, using stock-specific reference points and outlining the action to be taken if they are exceeded;

FURTHER RECALLING that Article 7.5.3 of the FAO Code of Conduct for Responsible Fisheries also recommends the implementation of stock specific target and limit reference points, inter alia, on the basis of the precautionary approach;

ACKNOWLEDGING that implementing pre-agreed harvest strategies including harvest control rules is considered a critical component of modern fisheries management and international best practices for fisheries management;

FURTHER NOTING that a harvest control rule encompasses a set of well-defined, pre-agreed rules or actions used for determining a management action in response to changes in indicators of stock status with respect to reference points;

NOTING that the Scientific Committee at its 17th Session, recommended the Commission consider an alternative approach to identify biomass limit reference points, such as those based on biomass depletion levels, when the MSY-based reference points are difficult to estimate. In cases where MSY-based reference points can be robustly estimated, limit reference points may be based around MSY;

FURTHER NOTING that the Scientific Committee also recommended that in cases where MSY-based reference points cannot be robustly estimated, biomass limit reference points be set at 20% of unfished levels ($B_{LIM} = 0.2B_0$);

ACKNOWLEDGING that the IOTC Scientific Committee has initiated a Commission requested process leading to a management strategy evaluation (MSE) process to improve upon the provision of scientific advice on HCRs;

RECALLING obligations and agreements under Resolutions 12/02[2], 15/01[3], 15/02[4], and 15/10[5];

ADOPTS in accordance with paragraph 1 of Article IX of the IOTC Agreement, that:

Objectives

1.To maintain the Indian Ocean Tuna Commission skipjack tuna stock in perpetuity, at levels not less than those capable of producing maximum sustainable yield (MSY) as qualified by relevant environmental and economic factors including the special requirements of Developing Coastal States and Small Island Developing States in the IOTC area of competence and considering the general objectives identified in Resolution 15/10 (or any subsequent revision).

2.To use a pre-agreed harvest control rule (HCR) to maintain the skipjack tuna stock at, or above, the target reference point (TRP) and well above the limit reference point (LRP), specified in Resolution 15/10 (or any subsequent revision).

Reference Points

3.Consistent with paragraph 2 of Resolution 15/10, the biomass limit reference point, B_{lim}, shall be 20% of unfished spawning biomass[6] (i.e. $0.2B_0$).

4.Consistent with paragraph 3 of Resolution 15/10, the biomass target reference point, B_{targ}, shall be 40% of unfished spawning biomass (i.e. $0.4B_0$).

5.The HCR described in paragraphs 6–12 seeks to maintain the skipjack tuna stock biomass at, or above, the target reference point while avoiding the limit reference point.

Harvest Control Rule (HCR)

6.The skipjack tuna stock assessment shall be conducted every three (3) years, with the next stock assessment to occur in 2017. Estimates of 7(a–c) shall be taken from a model-based stock assessment that has been reviewed by the Working Party on Tropical Tunas and endorsed by the Scientific Committee via its advice to the Commission.

7.The skipjack tuna HCR shall recommend a total annual catch limit using the following three (3) values estimated from each skipjack stock assessment. For each value, the reported median from the reference case adopted by the Scientific Committee for advising the Commission shall be used.

a)The estimate of current spawning stock biomass (B_{curr});

b)The estimate of the unfished spawning stock biomass (B_0);

c)The estimate of the equilibrium exploitation rate (E_{targ}) associated with sustaining the stock at B_{targ}.

8.The HCR shall have five control parameters set as follows:

a)Threshold level, the percentage of B_0 below which reductions in fishing mortality are required, $B_{thresh} = 40\%B_0$. If biomass is estimated to be below the threshold level, then fishing mortality reductions, as output by the HCR, will occur.

b)Maximum fishing intensity, the percentage of E_{targ} that will be applied when the stock status is at, or above, the threshold level $I_{max} = 100\%$. When the stock is at or above the threshold level, then fishing intensity (I) = I_{max}

2: 12/02: Data Confidentiality, policy and procedures
3: 15/01: On the recording of catch and effort data by fishing vessels in the IOTC Area of competence
4: 15/02: Mandatory statistical reporting requirements for IOTC Contracting Parties and Cooperating Non- Contracting Parties (CPCs)
5: 15/10: On Target and Limit Reference Points and a decision framework
6: The symbol B is used to refer to spawning biomass, the total mass of mature fish, i.e. B_0, B_{lim}, B_{targ} and B_{curr} all refer to different levels of spawning biomass.

c)Safety level, the percentage of B_0 below which non-subsistence catches are set to zero i.e. the non-subsistence[7] fishery is closed B_{saftey}= 10%B_0.

d)Maximum catch limit (C_{max}), the maximum recommended catch limit = 900,000t. To avoid adverse effects of potentially inaccurate stock assessments, the HCR shall not recommend a catch limit greater than C_{max}. This value is based upon the estimated upper limit of the MSY range in the 2014 skipjack stock assessment.

e)Maximum change in catch limit (D_{max}), the maximum percentage change in the catch limit = 30%. To enhance the stability of management measures the HCR shall not recommend a catch limit that is 30% higher, or 30% lower, than the previous recommended catch limit.

9.The recommended total annual catch limit shall be set as follows:

a)If the current spawning biomass (B_{curr}) is estimated to be at or above the threshold spawning biomass i.e., B_{curr} >= 0.4B_0, then the catch limit shall be set at [I_{max} x E_{targ} x B_{curr}]

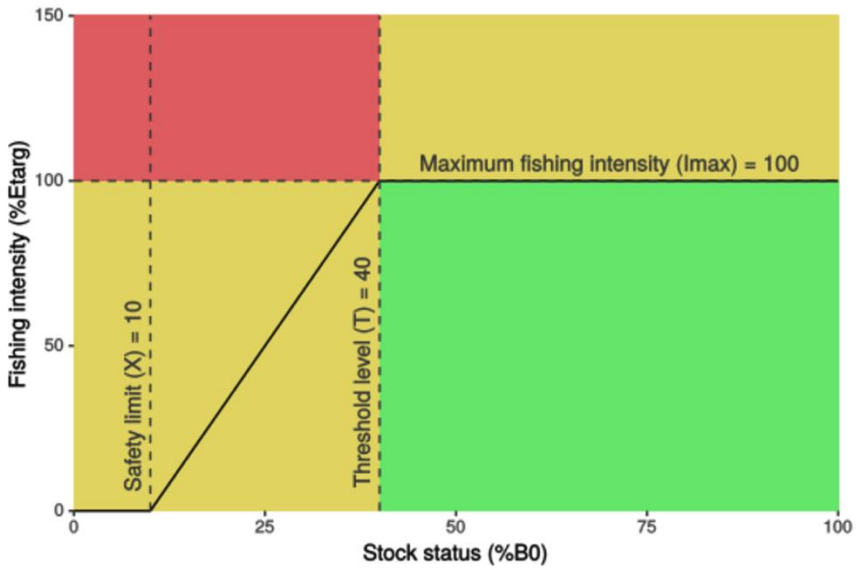
b)If the current spawning biomass (B_{curr}) is estimated to be below the threshold biomass i.e, B_{curr} < 0.4B_0, but greater than the safety level i.e.,B_{curr} > 0.1B_0, then the catch limit shall be set at [I x E_{targ} x B_{curr}]. See Table 1 in Appendix 1 for values of fishing intensity (I) for specific B_{curr}/B_0.

c)If the spawning biomass is estimated to be at, or below, the safety level, i.e. B_{curr} <= 0.1B_0 then the catch limit shall be at 0 for all fisheries other than subsistence fisheries.

d)In the case of (a) or (b), the recommended catch limit shall not exceed the maximum catch limit (C_{max}) and shall not increase by more than 30% or decrease by more than 30% from the previous catch limit.

e)In the case of (c) the recommended catch limit shall always be 0 regardless of the previous catch limit.

10.The HCR described in 8(a-e) produces a relationship between stock status (spawning biomass relative to unfished levels) and fishing intensity (exploitation rate relative to target exploitation rate) as shown below (See Table 1 in **Appendix 1** for specific values):



11.The catch limit shall by default, be implemented in accordance with the allocation scheme agreed for skipjack tuna by the Commission. In the absence of an allocation scheme, the HCR shall be applied as follows:

[7] A subsistence fishery is a fishery where the fish caught are consumed directly by the families of the fishers rather than being bought by middle-(wo)men and sold at the next larger market, per the FAO Guidelines for the routine collection of capture fishery data. FAO Fisheries Technical Paper. No. 382. Rome, FAO. 1999. 113p.

a)If the stock is at or above the Threshold level (i.e., $B_{curr} >= 0.4B_0$), then the HCR shall establish an overall catch limit.

b)If the stock falls below the Threshold level (i.e., $B_{curr} < 0.4B_0$), the fishing mortality reductions shall be implemented proportionally by CPCs for catches over 1 percent of the catch limit established by the HCR with due consideration to the aspirations and special requirements of Developing Coastal States and Small Island Developing States.

c)This paragraph shall not pre-empt or prejudice future allocation negotiations.

Review and exceptional circumstances

12.The HCR, including the control parameters, will be reviewed through further Management Strategy Evaluation (MSE), but no later than 2021 (i.e. five years from its implementation). Subject to the result of that review the current HCR may be refined or replaced with an alternative HCR.

13.In the case that the estimated spawning biomass falls below the limit reference point, the HCR will be reviewed, and consideration given to replacing it with an alternative HCR specifically designed to meet a rebuilding plan as advised by the Commission.

14.The recommended total annual catch produced by the HCR will be applied continuously as set forth in paragraph 11 above, except in case of exceptional circumstances, such as caused by severe environmental perturbations. In such circumstances, the Scientific Committee shall advise on appropriate measures.

Scientific Advice

15.The IOTC Scientific Committee shall:

a)Include the LRP and TRP as part of any analysis when undertaking all future assessments of the status of the IOTC skipjack tuna stock.

b)Undertake and report to the Commission a model-based skipjack tuna stock assessment every three (3) years, commencing with the next stock assessment in 2017.

c)Undertake a programme of work to further refine Management Strategy Evaluation (MSE) for the IOTC skipjack tuna fishery as required in paragraph 12 including, but not limited to,

i.Refinement of operating model(s)/ used,

ii.Alternative management procedures,

iii.Refining performance statistics.

Final Clause

16.The Commission shall review this measure at its annual session in 2019, or before if there is reason and/or evidence to suggest that the skipjack tuna stock is at risk of breaching the LRP.

Appendix 1

Table 1. Values of fishing intensity for alternative levels of estimated stock status ($\mathbf{B_{curr}/B_0}$) produced by the HCR

Stock status (B_{curr}/B_0)	**Fishing Intensity (I)**		**Stock status (B_{curr}/B_0)**	**Fishing Intensity (I)**
At or above 0.40	100%		0.24	46.7%
0.39	96.7%		0.23	43.3%
0.38	93.3%		0.22	40.0%
0.37	90.0%		0.21	36.7%
0.36	86.7%		0.20	33.3%
0.35	83.3%		0.19	30.0%
0.34	80.0%		0.18	26.7%
0.33	76.7%		0.17	23.3%
0.32	73.3%		0.16	20.0%
0.31	70.0%		0.15	16.7%
0.30	66.7%		0.14	13.3%
0.29	63.3%		0.13	10.0%
0.28	60.0%		0.12	6.7%
0.27	56.7%		0.11	3.3%
0.26	53.3%		0.10 or below	0%
0.25	50.0%			

APPENDIX E

RESOLUTION 19/02
PROCEDURES ON A FISH AGGREGATING DEVICES (FADS) MANAGEMENT PLAN

Keywords: FAD, active instrumented buoy.

The Indian Ocean Tuna Commission (IOTC),

BEARING IN MIND that the Agreement for the implementation of the Provisions of the United Nations Convention on the Law of the Sea relating to the Conservation and Management of Straddling Fish Stocks and Highly Migratory Fish Stocks (UNFSA) encourages coastal States and fishing States on the high seas to collect and share, in a timely manner, complete and accurate data concerning fishing activities on, inter alia, vessel position, catch of target and non-target species and fishing effort;

MINDFUL of the call upon States, either individually, collectively or through regional fisheries management organisations and arrangements in the United Nations General Assembly Resolution 67/79 on Sustainable fisheries to collect the necessary data in order to evaluate and closely monitor the use of large-scale fish aggregating devices and others, as appropriate, and their effects on tuna resources and tuna behaviour and associated and dependent species, to improve management procedures to monitor the number, type and use of such devices and to mitigate possible negative effects on the ecosystem, including on juveniles and the incidental bycatch of non-target species, particularly sharks and marine turtles;

NOTING that the United Nations Food and Agricultural Organization (FAO) Code of Conduct for Responsible Fishing provides that States should compile fishery-related and other supporting scientific data relating to fish stocks covered by sub-regional or regional fisheries management organisations and provide them in a timely manner to the organisation;

RECOGNISING that Fish Aggregating Devices under the competence of IOTC should be managed to ensure the sustainability of fishing operations;

GIVEN that the activities of supply vessels and the use of Fish Aggregating Devices (FAD) are an integral part of the fishing effort exerted by the purse seine fleet;

AWARE that the Commission is committed to adopt Conservation and Management Measures to reduce juvenile Bigeye tuna and Yellowfin tuna mortalities from fishing effort on Fish Aggregating Devices (FADs);

RECALLING that Resolution 12/04 established that the Commission at its annual session in 2013 should consider the recommendations of the IOTC Scientific Committee as regards the development of improved FAD designs to reduce the incidence of entanglement of marine turtles, including the use of biodegradable materials, together with socio-economic considerations, with a view to adopting further measures to mitigate interactions with marine turtles in fisheries covered by the IOTC Agreement;

RECALLING that Resolution 13/08 [superseded by Resolution 15/08, by Resolution 17/08, then by Resolution 18/08) established procedures on a fish aggregating device (FAD) management plan, including more detailed specifications of catch reporting from FAD sets, and the development of improved FAD designs to reduce the incidence of entanglement of non-target species;

NOTING that the IOTC Scientific Committee advised the Commission that only non-entangling FADs, both drifting and anchored, should be designed and deployed to prevent the entanglement of sharks, marine turtles and other species;

NOTING that the IOTC Scientific Committee advised the Commission to conduct an investigation of the feasibility and impacts of a temporary FAD closure as well as other measures in the context of Indian Ocean fisheries and stocks;

RECALLING that the objective of the IOTC Agreement is to ensure, through appropriate management, the conservation and optimum utilisation of stocks covered by the mentioned Agreement and encouraging sustainable development of fisheries based on such stocks and minimising the level of bycatch;

ADOPTS, in accordance with the provisions of Article IX, paragraph 1 of the IOTC Agreement, the following:

1. Definitions

For the purpose of this Resolution:

a) Fish Aggregating Device (FAD) means a permanent, semi-permanent or temporary object, structure or device of any material, man-made or natural, which is deployed and/or tracked, for the purpose of aggregating target tuna species for consequent capture.

b) Drifting Fish Aggregating Devices (DFADs) means a FAD not tethered to the bottom of the ocean. A DFAD typically has a floating structure (such as a bamboo or metal raft with buoyancy provided by buoys, corks, etc.) and a submerged structure (made of old netting, canvass, ropes, etc.).

c) Anchored Fish Aggregating Devices (AFADs) means a FAD tethered to the bottom of the ocean. It usually consists of a very large buoy and anchored to the bottom of the ocean with a chain.

d) Instrumented buoy means a buoy with a clearly marked with a unique reference number allowing identification of its owner and equipped with a satellite tracking system to monitor its position.

e) Operational buoy means any instrumented buoy, previously activated, switched on and deployed at sea on a drifting FAD or log, which transmit position and any other available information such as eco-sounder estimates.

f) Activation of a buoy means the act of initializing satellite communication service, which is done by the buoy supplier company at the request of the vessel owner or manager.

g) Deactivation of a buoy means the act of cancelling satellite communications service, which is done by the buoy supplier company at the request of the vessel owner or manager.

h) Buoy owner means any legal or natural person, entity or branch, who is paying for the communication service for the buoy associated with a FAD, and/or who is authorized to receive information from the satellite buoy, as well as to request its activation and/or deactivation.

i) Reactivation: the act of re-enabling satellite communications services by the buoy supplier company at the request of the buoy owner or manager.

j) Buoy in stock means an instrumented buoy acquired by the owner which has not been made operational.

2. This Resolution shall apply to CPCs having purse seine vessels and fishing on Drifting Fish Aggregating Devices (DFADs), equipped with instrumented buoys for the purpose of aggregating target tuna species, in the IOTC area of competence. Only purse seiners and associated supply or support vessels are allowed to deploy DFADs in the IOTC Area of Competence.

3. This resolution requires the use of instrumented buoy, as per the above definition, on all DFADs and prohibits the use of any other buoys, such as radio buoys, not meeting this definition.

4. This Resolution sets the maximum number of operational buoys followed by any purse seine vessel at 300 at any one time. The number of instrumented buoys that may be acquired annually for each purse seine vessel is set at no more than 500. No purse seine vessel shall have more than 500 instrumented buoys (buoy in stock and operational buoy) at any time. An instrumented buoy shall be made operational only when physically present on board the purse-seine vessel to which it belongs or its associated supply or support vessel, and the event shall be recorded in the appropriate logbook, specifying the instrumented buoy unique identification

number and the date, time and geographical coordinates of its deployment.

5. A CPC may adopt a lower limit than the one set out in paragraph 4 for vessels flying its flag. Further, any CPC may adopt a lower limit for DFADs deployed in its EEZ than that stated in paragraph 4. The CPC shall review the adopted limit to ensure that such limit is not more than the limit fixed by the Commission.

6. CPCs shall ensure that as from the effective date of this Resolution, each of its purse seiners already in operation does not exceed the maximum number of operational and instrumented buoys at any one time as set out in paragraph 4.

7. All purse seine vessel, supply or support vessel shall declare to its respective CPC, the number of instrumented buoys onboard, including each unique identifier of the instrumented buoy before and after each fishing trip.

8. Reactivation of an instrumented buoy shall only be possible once it has been brought back to port, either by the vessel tracking the buoy/ associated supply or support vessel or by another vessel and has been authorized by the CPC.

9. Notwithstanding the completion of any study undertaken at the request of the Commission including the study to be undertaken by the Working Group adopted at Resolution 15/09 in relation to FADs, the Commission may review the maximum number of instrumented buoys set out in paragraph 4.

10. CPCs shall require vessels flying their flag and fishing on DFADs to annually submit the number of operational buoys followed by vessel, lost and transferred (total number of DFADs tagged at sea, by deploying an instrumented buoy on a log or another vessel DFAD already in the water) by 1° by 1° grid area and month strata and DFAD type under the confidentiality rules set by Resolution 12/02 (or any subsequent superseding Resolution).

11. All CPCs shall ensure that all fishing vessels as referred to in paragraph 2 shall record fishing activities in association with FADs using the specific data elements found in Annex III (DFAD) and Annex IV (AFAD) in the section of the "FAD-logbook".

12. CPCs having vessels flying their flag and fishing on FADs shall submit, to the Commission, on an annual basis, Management Plans for the use of FADs. Due to their specificity in terms of users, type of boat/vessel involved, fishing method and gear used and materials used in their construction, the Management Plans and Reporting Requirements for Drifting FADs (DFAD) and Anchored FADs (AFAD) shall be addressed separately for the purposes of this Resolution. The Plans shall at a minimum follow the Guidelines for Preparation for FAD Management Plans by each CPC as provided for DFADs in Annex I and AFADs in Annex II.

13. The Management Plans shall be analysed by the IOTC Compliance Committee.

14. The Management Plans shall include initiatives or surveys to investigate, and to the extent possible minimise the capture of small bigeye tuna and yellowfin tuna and non-target species associated with fishing on FADs. Management Plans shall also include guidelines to prevent, to the extent possible, the loss or abandonment of FADs.

15. In addition to the Management Plans, all CPCs shall ensure that all fishing vessels flying their flag and fishing on FADs, including supply vessels, shall record fishing activities in association with FADs using the specific data elements found in Annex III (DFAD) and Annex IV (AFAD).

16. CPCs shall submit to the Commission, 60 days before the Annual Meeting, a report on the progress of the management plans of FADs, including, if necessary, reviews of the initially submitted Management Plans, and including reviews of the application of the principles set out in Annex III.

Non-entangling and biodegradable FADs

17. To reduce the entanglement of sharks, marine turtles or any other species, CPCs shall require their flagged vessels to use non-entangling designs and materials in the construction of FADs as outlined in Annex V.

18. To reduce the amount of synthetic marine debris, the use of natural or biodegradable materials in FAD construction should be promoted. CPCs shall encourage their flag vessels to use biodegradable FADs in accordance with the guidelines at Annex V with a view to transitioning to the use of biodegradable FADs, with the exception of materials used for the instrumented buoys, by their flag vessel from 1 January 2022. CPCs shall, from 1 January 2022, encourage their flag vessels to remove from the water, retain onboard and only dispose of in port, all traditional FADs encountered (e.g. those made of entangling materials or designs). The reference year prescribed above shall be reviewed in light of the Scientific Committee's recommendation pursuant to Resolution 18/04 *On BioFAD experimental project*.

19. CPCs are encouraged to conduct trials using biodegradable materials to facilitate the transition to the use of only biodegradable material for DFADS construction by their flagged vessels. The results of such trials shall be presented to the Scientific Committee who shall continue to review research results on the use of biodegradable material on FADs and shall provide specific recommendations to the Commission as appropriate.

FAD Marking

20. A new marking scheme shall be developed by the ad-hoc FAD working group and shall be considered by the Commission at its regular annual session in 2020.

21. Until the marking scheme referred to in paragraph 20 is adopted, CPCs shall ensure that the instrumented buoy attached to the DFAD contain a physical, unique reference number marking (ID provided by the manufacturer of the instrumented buoy) and the vessel unique IOTC registration number clearly visible.

Data reporting and analysis

22. CPCs shall submit the data elements prescribed in Annex III and Annex IV to the Commission, consistent with the IOTC standards for the provision of catch and effort data, and these data shall be made available for analysis to the IOTC Scientific Committee on the aggregation level set by Resolution 15/02 (or any subsequent superseding Resolution), and under the confidentiality rules set by Resolution 12/02 (or any subsequent superseding Resolution).

23. The IOTC Scientific Committee will analyse the information, when available, and provide scientific advice on additional FAD management options for consideration by the Commission, including recommendations on the number of FADs to be operated, the use of biodegradable materials in new and improved FADs design. When assessing the impact of FADs on the dynamic and distribution of targeted fish stocks and associated species and on the ecosystem, the IOTC Scientific Committee will, where relevant, use all available data on abandoned FADs (i.e. FADs without a beacon or which have drifted outside the fishing zone).

FAD Tracking and Recovery Procedures

24. In order to support the monitoring of compliance with the limitation established in Paragraph 4, while protecting business confidential data, the instrumented buoy supplier company or the CPCs shall, starting 1 January 2020, report, or require their vessels to report, daily information on all active FADs to the Secretariat. Such information shall contain, date, instrumented buoy ID, assigned vessel and daily position, which shall be compiled at monthly intervals, to be submitted with a time delay of at least 60 days, but no longer than 90 days.

25. The Commission shall establish a DFAD tracking and recovery policy at its annual session in 2021, on the basis of recommendations from the ad-hoc FAD working group. The policy shall define DFAD tracking, reporting of lost DFADs, arrangements to alert coastal States of derelict/lost DFADs at risk of beaching in near real-time,

how and who recovers the DFADs, how the recovery costs are collected and shared.

26. The IOTC Secretariat shall submit a report, on an annual basis, to the IOTC Compliance Committee on the level of compliance of each CPC with operational buoy limits, annual limits of instrumented buoys purchased.

27. This resolution shall be reviewed by the Commission, at the latest, at its session in 2022, based on recommendations from the Scientific Committee.

28. This resolution shall enter into force on 1 January 2020.

29. Resolution 18/08 *Procedures on a fish aggregating devices (FADs) management plan, including more detailed specification of catch reporting from FAD sets, and the development of improved FAD designs to reduce the incidence of entanglement of non-target species* is superseded by this Resolution.

ANNEX I

GUIDELINES FOR PREPARATION OF DRIFTING FISH AGGREGATING DEVICE (DFAD) MANAGEMENT PLANS

To support obligations in respect of the DFAD Management Plan (DFAD–MP) to be submitted to the IOTC Secretariat by CPCs with fleets fishing in the IOTC area of competence, associated to DFADs, DFAD–MP should include:

1.An objective

2.Scope

Description of its application with respect to:

- vessel-types and support and tender vessels
- DFAD numbers and DFADs beacon numbers to be deployed
- reporting procedures for DFAD deployment
- incidental bycatch reduction and utilisation policy
- consideration of interaction with other gear types
- plans for monitoring and retrieval of lost DFADs
- statement or policy on “DFAD ownership”

3.Institutional arrangements for management of the DFAD Management Plans:

- institutional responsibilities
- application processes for DFAD and /or DFAD beacons deployment approval
- obligations of vessel owners and masters in respect of DFAD and /or DFAD beacons deployment and use
- DFAD and/or DFADs beacons replacement policy
- reporting obligations

4.DFAD construction specifications and requirements:

- DFAD design characteristics (a description)
- DFAD markings and identifiers, including DFADs beacons
- lighting requirements
- radar reflectors
- visible distance
- radio buoys (requirement for serial numbers)
- satellite transceivers (requirement for serial numbers)

5.Applicable areas:

- Details of any closed areas or periods e.g. territorial waters, shipping lanes, proximity to artisanal fisheries, etc.

6.Applicable period for the DFAD–MP.

7.Means for monitoring and reviewing implementation of the DFAD–MP.

8.DFAD logbook template (data to be collected specified in Annex III).

ANNEX II

GUIDELINES FOR PREPARATION OF ANCHORED FISH AGGREGATING DEVICE (AFAD) MANAGEMENT PLANS

To support obligations in respect of the AFAD Management Plan (AFAD–MP) to be submitted to the IOTC Secretariat by CPCs with fleets fishing in the IOTC area of competence, associated to AFADs, AFAD– MP should include:

1.An objective

2.Scope:

Description of its application with respect to:

a) vessel types
b) AFAD numbers and/or AFADs beacons numbers to be deployed (per AFAD type)
c) reporting procedures for AFAD deployment
d) distances between AFADs
e) incidental bycatch reduction and utilisation policy
f) consideration of interaction with other gear types
g) the establishment of inventories of the AFADs deployed, detailing AFAD identifiers, characteristics and equipment of each AFAD as laid down in point 4 of the present Annex, coordinates of the AFAD's mooring sites, date of set, lost and reset
h) plans for monitoring and retrieval of lost AFADs
i) statement or policy on “AFAD ownership”

3.Institutional arrangements for management of the AFAD Management Plans:

a) institutional responsibilities
b) regulations applicable to the setting and use of AFADs
c) AFAD repairs, maintenance rules and replacement policy
d) data collection system
e) reporting obligations

4.AFAD construction specifications and requirements:

a) AFAD design characteristics (a description of both the floating structure and the underwater structure, with special emphasis on any netting materials used)
b) anchorage used for mooring
c) AFAD markings and identifiers, including AFAD beacons if any
d) lighting requirements if any
e) radar reflectors
f) visible distance
g) radio buoys if any (requirement for serial numbers)
h) satellite transceivers (requirement for serial numbers)
i) echo sounder

5.Applicable areas:

a) coordinates of mooring sites, if applicable
b) details of any closed areas e.g., shipping lanes, Marine Protected Areas, reserves etc.

6.Means for monitoring and reviewing implementation of the AFAD–MP.

7.AFAD logbook template (data to be collected specified in Annex IV).

ANNEX III
DATA COLLECTION FOR DFADS

a) For each activity on a DFAD, whether followed by a set or not, each fishing, support and supply vessel to report the following information:

i. Vessel (name and registration number of the fishing, support or supply vessel)
ii. Position (as the geographic location of the event (Latitude and Longitude) in degrees and minutes)
iii. Date (as DD/MM/YYYY, day/month/year)
iv. DFAD identifier (DFAD or beacon ID)
v. DFAD type (drifting natural FAD, drifting artificial FAD),
vi. DFAD design characteristics
    - Dimension and material of the floating part and of the underwater hanging structure
vii. Type of the activity, (visit deployment, hauling, retrieving, loss, intervention to service electronic equipment).

b) If the visit is followed by a set, the results of the set in terms of catch and bycatch, whether retained or discarded dead or alive. CPCs to report this data aggregated per vessel at 1*1 degree (where applicable) and monthly to the Secretariat

ANNEX IV
DATA COLLECTION FOR AFADS

a) Any activity around an AFAD.

b) For each activity on an AFAD (repair, intervention consolidation, etc.), whether followed or not by a set or other fishing activities, the,

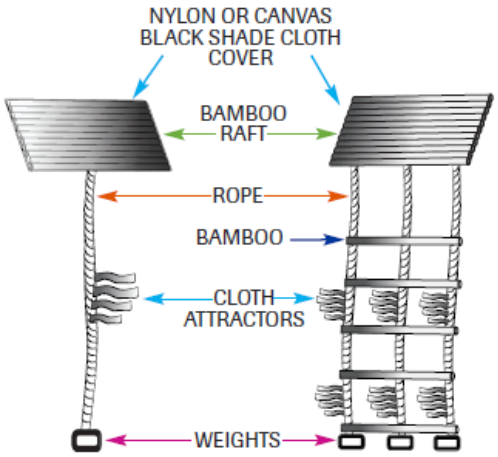
   i. Position (as the geographic location of the event (Latitude and Longitude) in degrees and minutes)
   ii. Date (as DD/MM/YYYY, day/month/year)
   iii. AFAD identifier (i.e. AFAD Marking or beacon ID or any information allowing to identify the owner).

c) If the visit is followed by a set or other fishing activities, the results of the set in terms of catch and bycatch, whether retained or discarded dead or alive.

ANNEX V

PRINCIPLES FOR DESIGN AND DEPLOYMENT OF FADS

EXAMPLE OF NON-ENTANGLING FAD



1. The surface structure of the FAD shall not be covered, or only covered with non-meshed material
2. If a sub-surface component is used, it shall not be made from netting but from non-meshed materials such as ropes or canvas sheets.

APPENDIX F

RESOLUTION 21/01
ON AN INTERIM PLAN FOR REBUILDING THE INDIAN OCEAN YELLOWFIN TUNA STOCK IN THE IOTC AREA OF COMPETENCE

Keywords: Yellowfin tuna, Kobe Process, MSY, Precautionary Approach

The Indian Ocean Tuna Commission (IOTC),

CONSIDERING 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 as qualified by relevant environmental and economic factors including the special requirements of developing States in the IOTC area of competence;

BEING MINDFUL of Article XVI of the IOTC Agreement regarding the rights of Coastal States and of Article 87 and 116 of the UN Convention of the Law of the Sea regarding the right to fish on the high seas;

RECOGNISING the special requirements of the developing States, particularly Small Island developing States in Article 24(b), of the Agreement for the Implementation of the Provisions of the United Nations Convention of the Law of the Sea of December 1982, relating to the Conservation and Management of Straddling Fish Stocks and Highly Migratory Fish Stocks (UNFSA);

FURTHER RECOGNISING the need to ensure that conservation and management measures do not result in transferring, directly or indirectly, a disproportionate burden of conservation action onto developing States, Article 24(c) of UNFSA;

RECALLING that Article 5, of UNFSA entitles the conservation and management of highly migratory fish stocks are based on best scientific evidence available and with special reference to IOTC Resolution 15/10 for a stock where the assessed status places it within the red quadrant, and with an aim to end overfishing with a high probability and to rebuild the biomass of the stock in as short time as possible;

FURTHER RECALLING that Article 6, of UNFSA and IOTC Resolution 12/01 *"On the implementation of the precautionary approach",* requires the States to be cautious during the application of precautionary approach when information is uncertain, unreliable or inadequate and this should not be a reason for postponing or failing to take conservation and management measures;

CONSIDERING the recommendations adopted by the KOBE II, held in San Sebastian, Spain, June 23 – July 3 2009; implementing where appropriate a freeze on fishing capacity on a fishery by fishery basis and such a freeze should not constrain the access to, development of, and benefit from sustainable tuna fisheries by developing coastal States;

FURTHER CONSIDERING the recommendations adopted by the KOBE III, held in La Jolla, California, 12- 14 July 2011; considering the status of the stocks, each RFMO should consider a scheme for reduction of overcapacity in a way that does not constrain the access to, development of, and benefit from sustainable tuna fisheries, including on the high seas, by developing coastal States, in particular Small Island Developing States, territories, and States with small and vulnerable economies; and Transfer of capacity from developed fishing members to developing coastal fishing members within its area of competence where appropriate;

FURTHER CONSIDERING the concern of the 20th Session of the Working Party for Tropical Tuna held in Seychelles, 29 October – 3 November 2018, the change in strategy by increase of usage of FADs by the purse seine vessels to maintain catch level targets has led to a substantial increase of juvenile yellowfin tuna and bigeye tuna;

NOTING THAT supply vessels contribute to the increase in effort and capacity of purse seiners and that the number of supply vessels has increased significantly over the years;

FURTHER CONSIDERING the call by the United Nations General Assembly Resolution 70/75 upon the States to increase the reliance on scientific advice in developing, adopting and implementing conservation and management measures and to take into account the special requirements of developing States, including Small Island Developing States (SIDS) as highlighted in the SIDS Accelerated Modalities of Action (SAMOA) Pathway;

NOTING THAT Article V.2b of the Agreement for the Establishment of the Indian Ocean Tuna Commission give full recognition to the special interests and needs of Members in the region that are developing countries, in relation to the conservation and management and optimum utilization of stocks covered by this Agreement and encouraging development of fisheries based on such stocks;

FURTHER NOTING THAT Article V.2d requires the Commission to keep under review the economic and social aspects of the fisheries based on the stocks covered by this Agreement bearing in mind, in particular, the interests of developing coastal States. This includes ensuring that conservation and management measures adopted by it do not result in transferring, directly or indirectly, a disproportionate burden of conservation action onto developing States, especially Small Island Developing States;

RECOGNIZING FURTHER the interactions that occur between the fisheries for yellowfin, skipjack and bigeye tuna;

FURTHER CONSIDERING the management advice of the 23rd session of the Scientific Committee, that given the limitations and uncertainties in the stock assessment and the inability to use K2SM derived from the 2018 yellowfin tuna stock assessment, the catches to be reduced to a level at least below the C_{MSY} estimate (403, 000MT) and the need to decrease the fishing mortality from the 2017 level in order to remove overfishing on the stock;

FURTHER CONSIDERING the issues raised in the 23rd session of the Scientific Committee regarding the estimated K2SM probabilities derived from the 2018 stock assessment, and that due to critical errors in projections and estimations in computing probabilities in the K2SM developed in 2018, the K2SM is not suitable to provide management advice;

FURTHER CONSIDERING the SC 2020 advice that Commission should ensure that CPCs take all necessary action to achieve the catch reductions in their fleets as per Resolution 19/01.

ADOPTS, in accordance with the provisions of Article IX, paragraph 1 of the IOTC Agreement, the following:

Application

1.This resolution shall apply to all CPCs within the IOTC area of competence.

2.This resolution will be effective from 1 January 2022. The measures contained within this Resolution shall be considered as interim measure and will be reviewed by the Commission no later than at its annual Session in 2022.

3. Notwithstanding paragraph 2, this Resolution shall be reviewed when a formal Management Procedure for the management of the yellowfin tuna stock is adopted by the Commission and in effect.

4. Nothing in this resolution shall pre-empt or prejudice future allocation of fishing opportunities.

Catch limits

5. CPCs whose reported catches of yellowfin tuna for 2014 were above 5000t shall reduce their catches of yellowfin tuna by 21% compared to 2014 yellowfin tuna catch, except:
   a. If those CPCs are Coastal Developing States, they shall reduce their catches of yellowfin tuna by 12% compared to 2014 yellowfin tuna catch;
   b. If those CPCs are Small Island Developing States or Least Developed States, they shall reduce their catches of yellowfin tuna by 10% compared to 2014 yellowfin tuna catch.

6. CPCs whose reported catches of yellowfin tuna for 2014 were below 5000t and their average catches of yellowfin tuna for the period from 2017 to 2019 inclusive, were above 5000t, shall reduce their catches of yellowfin tuna by 21% compared to 2014 yellowfin tuna catch, except;
   a. If those CPCs are Coastal Developing States, they shall reduce their catches of yellowfin tuna by 12% compared to average of 2017 – 2019 yellowfin tuna catch;
   b. If those CPCs are Small Island Developing States or Least Developed States, they shall reduce their catches of yellowfin tuna by 10% compared to average of 2017 – 2019 or 2018 yellowfin tuna catch, whichever is higher.

7. CPCs whose reported catches of yellowfin tuna for 2014 were below 5000t and their average catches of yellowfin tuna for the period from 2017 to 2019 inclusive were between 2000t to 5000t, shall not exceed their maximum reported yellowfin tuna catches between 2017 to 2019.

8. CPCs whose reported catches of yellowfin tuna for 2014 were below 5000t and their average catches of yellowfin tuna for the period from 2017 to 2019 inclusive were below 2000t, shall not exceed their catches above 2000t

9. In respect of paragraph 8, and recalling paragraph 4, for conservation purposes three CPCs have agreed exceptionally for 2022 (or 1 year) not to exceed yellowfin tuna catches at different levels[8]

10. In applying the catch reductions in paragraph 5, Small Island Developing State CPCs and Least Developed State CPCs can either choose between catches of yellowfin tuna reported for either 2014, or 2015 or their average catches for the period from 2017 to 2019.

11. In applying the catch reductions in paragraph 5 for Distant Water Fishing CPCs, if the average yellowfin tuna catches between 2017 – 2019 were below 10,000t, CPCs shall reduce their yellowfin catch by 13% compared to 2014 levels.

12. CPCs will determine appropriate methods for achieving these catch reductions, which could include capacity reductions, effort limits, etc.., and will report to the IOTC Secretariat in their Implementation Report every year.

13. Any CPC who submits updated catch histories of yellowfin tuna in accordance with IOTC resolution 15/01 and verified by the secretariat and the IOTC Scientific Committee, shall have a right to access yellowfin tuna in accordance with the limits prescribed in the Resolution.

[8] France (OT) 500t; Philippines 700t; and the United Kingdom 500t.

Over catch of annual limit

14. If over catch of an annual limit for a given CPC listed in paragraphs 5 to 11 occurs, catch limits for that CPC shall be reduced as follows:
    a. for over-catch of limits set forth in Resolution 19/01, in 2020 and/or 2021, 100% of that over-catch shall be deducted from following two years limit, and;

    b. over-catch in 2022 and following years, 100% of that over-catch shall be deducted from the following two years' limit, unless;

    c. over-catch for that CPC has occurred in two or more consecutive years, in which case 125% of the over-catch shall be deducted from the following two years limit.

15. CPCs that are subject to catch reductions due to over-catch shall inform the Commission via the IOTC Compliance Committee, corrective actions taken by the CPC to adhere to the prescribed catch levels, in their implementation Report.

16. The revised limits from paragraph 14 will apply in the following year and CPCs compliance shall be assessed against the revised limits reported to the IOTC Compliance Committee.

17. The tropical tuna data submitted by CPCs in accordance with Resolution 15/01 *"On the recording of catch and effort data by fishing vessels in the IOTC area of competence"* and Resolution 15/02 *"Mandatory statistical reporting requirements for IOTC Contracting Parties and Cooperating Non-Contracting Parties (CPCs)"* shall be reviewed by the Secretariat and discussed by the Scientific Committee for possible inconsistencies. In such cases, the Scientific Committee shall provide the rationale of the detected inconsistencies and justify the choice of the best solution available with regard the scientific analysis to be carried out. Data used for catch limit calculations shall be based on the data reviewed, including possible estimates, by the Secretariat.

Supply Vessels

18. CPCs shall gradually reduce supply vessels[9] in purse seine operations targeting tropical tuna, by 31 December 2022 as specified below in (a) and (b). Flag States shall submit the status of reducing the use of supply vessel as part of the report of Implementation to the Compliance Committee.
    a. From 1 January 2022 to 31 December 2024: 3 supply vessels in support of not less than 10 purse seiners, all of the same flag State[10].

    b. No CPC is allowed to register any new or additional supply vessel on the IOTC Record of Authorized Vessels.

19. A single purse seine vessel shall not be supported by more than one single supply vessel of the same flag State at any point of time.

20. Complementary to Resolution 15/08 and to Resolution 15/02, CPC/flag States shall report annually before the 1st of January for the coming year of operations which Purse seiners are served by each supply vessel. This information will be published on IOTC website so as to be accessible to all CPCs and is mandatory.

[9] For the purpose of this resolution, the term "supply vessel" includes "support vessel"

[10] The subparagraph (a) shall not apply to CPCs which use only one supply vessel

Gillnet

21. Without prejudice to Article 16 of the IOTC Agreement, CPCs shall encourage phasing out or convert gillnet fishing vessels to other gears, considering the huge ecological impact of these gears and fast track the implementation of Resolution 17/07 *"On the Prohibition to use large-scale driftnets in the IOTC"*, noting that large-scale driftnets are prohibited in the IOTC Area of Competence from 1 January 2022.

22. CPCs shall set their gillnets at 2m depth from the surface in gillnet fisheries by 2023 to mitigate ecological impacts of gillnets.

23. CPCs are encouraged to increase their observer coverage or field sampling in gillnet fishing vessels by 10% using alternative data collection methodologies (electronic or human) verified by the IOTC Scientific Committee by 2023.

24. CPCs shall report the level of implementation of paragraphs 21-23 to the Commission via the Compliance Committee.

Administration

25. The IOTC Secretariat under advice of the Scientific Committee shall prepare and a table of allocated catch limits disaggregated as per the conditions set out in paragraphs 5-11 for following year, in December of the current year.

26. For the purposes of the implementation of this resolution, each CPC shall, by 15 February of the following year, notify to the Executive Secretary the list of vessels, which have fished for yellowfin tuna in the IOTC area of competence for the preceding year.

27. The IOTC Secretariat shall report each year these lists of active vessels to the IOTC Compliance Committee and to the IOTC Scientific Committee in the form of aggregated statistics concerning fishing fleets capacity metrics.

28. CPCs shall monitor the yellowfin tuna catches from their vessels in conformity with Resolution 15/01 *"On the recording of catch and effort data by fishing vessels in the IOTC area of competence"* and Resolution 15/02 *"Mandatory statistical reporting requirements for IOTC Contracting Parties and Cooperating Non Contracting Parties (CPCs)"* and will provide a summary of most-recent yellowfin catches for the consideration of the IOTC Compliance Committee.

29. Each year, the IOTC Compliance Committee shall evaluate the level of compliance with the reporting obligations and the catch limits deriving from this Resolution and shall make recommendations to the Commission accordingly.

30. The IOTC Scientific Committee via its Working Party on Tropical Tunas shall implement the "Workplan to improve current assessment of yellowfin tuna" and shall advice the Commission the financial and administrational requirements to further strengthen the work undertaken to minimize the issues and complexities regarding yellowfin tuna stock assessment.

31. The IOTC Scientific Committee and its Working Parties shall prioritise the work on the yellowfin tuna management procedure and to provide advice to the Technical Committee on Management Procedures and to

enable the Commission to adopt the yellowfin tuna management procedure at the earliest opportunity.

32. The Scientific Committee via its Working Party on Tropical Tunas shall undertake evaluation of the effectiveness of the measures detailed in this Resolution, taking into account all sources of fishing mortality possible aiming at returning and maintaining biomass levels at the Commission's target level.

33. This Resolution supersedes IOTC Resolution 19/01 *On an interim plan for rebuilding the Indian Ocean yellowfin tuna stock.*

APPENDIX G

RESOLUTION 21/03
ON HARVEST CONTROL RULES FOR SKIPJACK TUNA IN THE IOTC AREA OF COMPETENCE

Keywords: Skipjack tuna; Reference Points; Harvest Control Rules; Precautionary Approach; Management Strategy Evaluation.

The Indian Ocean Tuna Commission (IOTC),

NOTING Article V, paragraph 2(c), of the IOTC Agreement is to adopt, in accordance with Article IX and on the basis of scientific evidence, Conservation and Management Measures to ensure the conservation of the stocks covered by the Agreement;

BEING MINDFUL of Article XVI of the IOTC Agreement regarding the rights of Coastal States, Article 87 and 116 of the UN Convention of the Law of the Sea regarding the right to fish on the high seas and of Article 24 of the Agreement for the Implementation of the Provisions of the United Nations Convention of the Law of the Sea of December 1982 relating to the Conservation and Management of Straddling Fish Stocks and Highly Migratory Fish Stocks (UNFSA) regarding recognition of the special requirements of developing states;

RECOGNISING Resolution 12/01 *On the implementation of the precautionary approach* calls on the Indian Ocean Tuna Commission to implement and apply the precautionary approach, in accordance Article 6 of the Agreement for the Implementation of the Provisions of the United Nations Convention of the Law of the Sea of December 1982 relating to the Conservation and Management of Straddling Fish Stocks and Highly Migratory Fish Stocks (UNFSA);

RECOGNISING the ongoing discussions on allocation and the need to avoid prejudicing future decision of the Commission;

FURTHER CONSIDERING the call by the United Nations General Assembly Resolution 70/75 upon the states to increase the reliance on scientific advice in developing, adopting and implementing conservation and management measures and to take into account the special requirements of developing states, including Small Island developing States as highlighted in the SIDS Accelerated Modalities of Action (SAMOA) Pathway;

CONSIDERING the recommendations adopted by the KOBE II, held in San Sebastian, Spain, June 23 – July 3 2009; implementing where appropriate a freeze on fishing capacity on a fishery by fishery basis and such a freeze should not constrain the access to, development of, and benefit from sustainable tuna fisheries by developing coastal States;

TAKING INTO ACCOUNT the need to have due regard for the interests of all Members concerned, in conformity with the rights and obligations of those Members under international law and in particular, to the rights and obligations for developing countries;

RECALLING Article 6, paragraph 3(b) of UNFSA that calls on States to implement the precautionary approach using the best scientific information available, using stock-specific reference points and outlining the action to be taken if they are exceeded;

FURTHER RECALLING that Article 7.5.3 of the FAO Code of Conduct for Responsible Fisheries also recommends the implementation of stock specific target and limit reference points, inter alia, on the basis of the precautionary approach;

ACKNOWLEDGING that implementing pre-agreed harvest strategies including harvest control rules is considered a critical component of modern fisheries management and international best practices for fisheries management;

FURTHER NOTING that a harvest control rule encompasses a set of well-defined, pre-agreed rules or actions used for determining a management action in response to changes in indicators of stock status with respect to reference points;

NOTING that the Scientific Committee at its 17th Session, recommended the Commission consider an alternative approach to identify biomass limit reference points, such as those based on biomass depletion levels, when the MSY-

based reference points are difficult to estimate. In cases where MSY-based reference points can be robustly estimated, limit reference points may be based around MSY;

FURTHER NOTING that the Scientific Committee also recommended that in cases where MSY-based reference points cannot be robustly estimated, biomass limit reference points be set at 20% of unfished levels ($B_{LIM} = 0.2B_0$);

ACKNOWLEDGING that the IOTC Scientific Committee has initiated a Commission requested process leading to a management strategy evaluation (MSE) process to improve upon the provision of scientific advice on HCRs;

RECALLING obligations and agreements under Resolutions 12/02[11], 15/01[12], 15/02[13], and 15/10[14];

RECOGNIZING the SC20 advice that the total catches of skipjack tuna in 2018 were 30% larger than the resulting catch limit from the skipjack HCR for the period 2018-2020 (470,029 t);

RECALLING that the 2019 skipjack catch from the Indian Ocean was 547,248t and the maximum catch limit calculated applying the HCR specified in Resolution 16/02 is 513,572t for the period 2021-2023;

FURTHER RECOGNIZING that reaching the management objectives defined in Resolution 16/02 requires that the catch limits adopted by the skipjack HCR are implemented effectively and the need for the Commission to ensure that catches of skipjack tuna during this period do not exceed the agreed limit.

ADOPTS in accordance with paragraph 1 of Article IX of the IOTC Agreement, that:

Objectives

1. To maintain the Indian Ocean Tuna Commission skipjack tuna stock in perpetuity, at levels not less than those capable of producing maximum sustainable yield (MSY) as qualified by relevant environmental and economic factors including the special requirements of Developing Coastal States and Small Island Developing States in the IOTC area of competence and considering the general objectives identified in Resolution 15/10 (or any subsequent revision).

2. To use a pre-agreed harvest control rule (HCR) to maintain the skipjack tuna stock at, or above, the target reference point (TRP) and well above the limit reference point (LRP), specified in Resolution 15/10 (or any subsequent revision).

Reference Points

3. Consistent with paragraph 2 of Resolution 15/10, the biomass limit reference point, B_{lim}, shall be 20% of unfished spawning biomass[15] (i.e. $0.2B_0$).

4. Consistent with paragraph 3 of Resolution 15/10, the biomass target reference point, B_{targ}, shall be 40% of unfished spawning biomass (i.e. $0.4B_0$).

5. The HCR described in paragraphs 6–12 seeks to maintain the skipjack tuna stock biomass at, or above, the target reference point while avoiding the limit reference point.

[11] 12/02: Data Confidentiality, policy and procedures

[12] 15/01: On the recording of catch and effort data by fishing vessels in the IOTC Area of competence

[13] 15/02: Mandatory statistical reporting requirements for IOTC Contracting Parties and Cooperating Non- Contracting Parties (CPCs)

[14] 15/10: On Target and Limit Reference Points and a decision framework

[15] The symbol B is used to refer to spawning biomass, the total mass of mature fish, i.e. B0, Blim, Btarg and Bcurr all refer to different levels of spawning biomass.

Harvest Control Rule (HCR)

6.The skipjack tuna stock assessment shall be conducted every three (3) years, with the next stock assessment to occur in 2023. Estimates of 7(a–c) shall be taken from a model-based stock assessment that has been reviewed by the Working Party on Tropical Tunas and endorsed by the Scientific Committee via its advice to the Commission.

7.The skipjack tuna HCR shall recommend a total annual catch limit using the following three (3) values estimated from each skipjack stock assessment. For each value, the reported median from the reference case adopted by the Scientific Committee for advising the Commission shall be used.

a) The estimate of current spawning stock biomass (B_{curr});

b) The estimate of the unfished spawning stock biomass (B_0);

c) The estimate of the equilibrium exploitation rate (E_{targ}) associated with sustaining the stock at B_{targ}.

8.The HCR shall have five control parameters set as follows:

b) Threshold level, the percentage of B0 below which reductions in fishing mortality are required, Bthresh = 40%B0. If biomass is estimated to be below the threshold level, then fishing mortality reductions, as

output by the HCR, will occur.

c) Maximum fishing intensity, the percentage of E_{targ} that will be applied when the stock status is at, or above, the threshold level I_{max} = 100%. When the stock is at or above the threshold level, then fishing intensity (I) = I_{max}

d) Safety level, the percentage of B_0 below which non-subsistence catches are set to zero i.e. the non-subsistence[16]6 fishery is closed B_{saftey}= 10%B_0.

e) Maximum catch limit (C_{max}), the maximum recommended catch limit = 900,000t. To avoid adverse effects of potentially inaccurate stock assessments, the HCR shall not recommend a catch limit greater than C_{max}. This value is based upon the estimated upper limit of the MSY range in the 2014 skipjack stock assessment.

f) Maximum change in catch limit (D_{max}), the maximum percentage change in the catch limit = 30%. To enhance the stability of management measures the HCR shall not recommend a catch limit that is 30% higher, or 30% lower, than the previous recommended catch limit.

9. The recommended total annual catch limit shall be set as follows:

a) If the current spawning biomass (B_{curr}) is estimated to be at or above the threshold spawning biomass i.e., B_{curr} >= 0.4B_0, then the catch limit shall be set at [I_{max} x E_{targ} x B_{curr}]

[16] A subsistence fishery is a fishery where the fish caught are consumed directly by the families of the fishers rather than being bought by middle-(wo)men and sold at the next larger market, per the FAO Guidelines for the routine collection of capture fishery data. FAO Fisheries Technical Paper. No. 382. Rome, FAO. 1999. 113p.

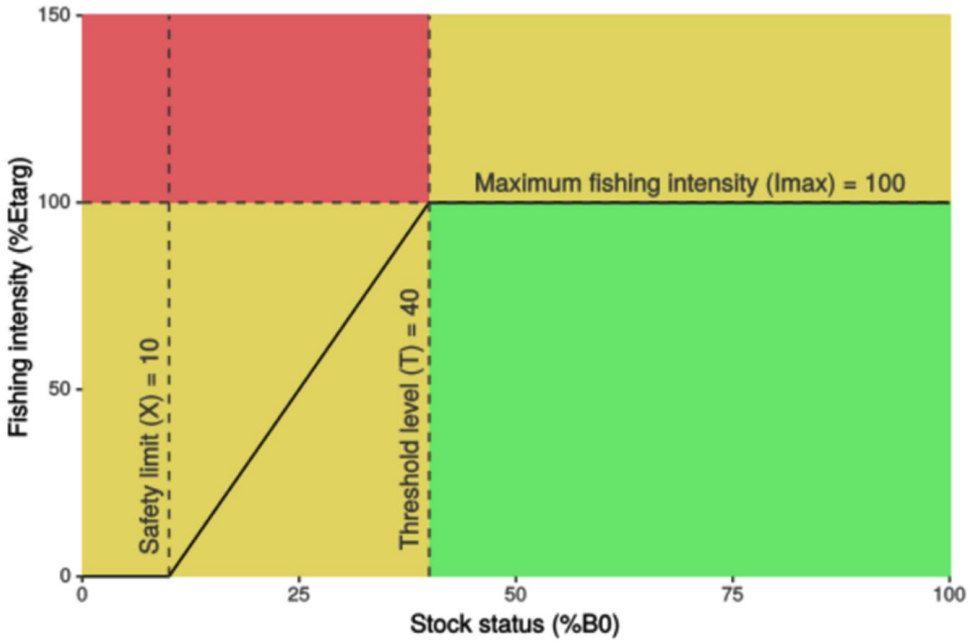
b) If the current spawning biomass (B_{curr}) is estimated to be below the threshold biomass i.e, $B_{curr} < 0.4B_0$, but greater than the safety level i.e.,$B_{curr} > 0.1B_0$, then the catch limit shall be set at [I x E_{targ} x B_{curr}]. See Table 1 in Appendix 1 for values of fishing intensity (I) for specific B_{curr}/B_0.

c) If the spawning biomass is estimated to be at, or below, the safety level, i.e. $B_{curr} <= 0.1B_0$ then the catch limit shall be at 0 for all fisheries other than subsistence fisheries.

d) In the case of (a) or (b), the recommended catch limit shall not exceed the maximum catch limit (C_{max}) and shall not increase by more than 30% or decrease by more than 30% from the previous catch limit.

e) In the case of (c) the recommended catch limit shall always be 0 regardless of the previous catch limit.

10. The HCR described in 8(a-e) produces a relationship between stock status (spawning biomass relative to unfished levels) and fishing intensity (exploitation rate relative to target exploitation rate) as shown below (See Table 1 in **Appendix 1** for specific values):



11. The catch limit shall by default, be implemented in accordance with the allocation scheme agreed for skipjack tuna by the Commission. In the absence of an allocation scheme, the HCR shall be applied as follows:

a) If the stock is at or above the Threshold level (i.e., $B_{curr} >= 0.4B_0$), then the HCR shall establish an overall catch limit and catches of skipjack tuna for any given year shall be maintained at or below the overall catch limit established by the HCR.

b) If the stock falls below the Threshold level (i.e., $B_{curr} < 0.4B_0$), the fishing mortality reductions shall be implemented proportionally by CPCs for catches over 1 percent of the catch limit established by the HCR with due consideration to the aspirations and special requirements of Developing Coastal States and Small Island Developing States.

c) The Commission may consider to develop and adopt Conservation and Management Measure(s) to ensure catches of skipjack tuna are maintained at or below the overall catch limit established by the HCR and to apply fishing mortality reductions if the stock falls below the Threshold level (i.e $B_{curr} < 0.4B_0$), with due consideration to the aspirations and special requirements of Developing Coastal States and Small Island Developing States, no later than the annual session of the IOTC in 2022.

d) This paragraph shall not pre-empt or prejudice future allocation negotiations.

Review and exceptional circumstances

12. The HCR, including the control parameters, will be reviewed through further Management Strategy Evaluation (MSE).

13. In the case that the estimated spawning biomass falls below the limit reference point, the HCR will be reviewed, and consideration given to replacing it with an alternative HCR specifically designed to meet a rebuilding plan as advised by the Commission.

14. The recommended total annual catch produced by the HCR will be applied continuously as set forth in paragraph 11 above, except in case of exceptional circumstances, such as caused by severe environmental perturbations. In such circumstances, the Scientific Committee shall advise on appropriate measures.

Scientific Advice

15. The IOTC Scientific Committee shall:

a) Include the LRP and TRP as part of any analysis when undertaking all future assessments of the status of the IOTC skipjack tuna stock.

b) Undertake and report to the Commission a model-based skipjack tuna stock assessment every three (3) years, commencing with the next stock assessment in 2023.

c) Undertake a programme of work to further refine Management Strategy Evaluation (MSE) for the IOTC skipjack tuna fishery as required in paragraph 12 including, but not limited to,

i. Refinement of operating model(s)/ used,
ii. Alternative management procedures,
iii. Refining performance statistics.

Final Clause

16. The Commission shall review this measure at its annual session in 2022, or before if there is reason and/or evidence to suggest that the skipjack tuna stock is at risk of breaching the LRP.

Appendix 1

Table 1. Values of fishing intensity for alternative levels of estimated stock status (B_{curr}/B_0) produced by the HCR

Stock status (B_{curr}/B_0)	**Fishing Intensity (I)**		**Stock status (B_{curr}/B_0)**	**Fishing Intensity (I)**
At or above 0.40	100%		0.24	46.7%
0.39	96.7%		0.23	43.3%
0.38	93.3%		0.22	40.0%
0.37	90.0%		0.21	36.7%
0.36	86.7%		0.20	33.3%
0.35	83.3%		0.19	30.0%
0.34	80.0%		0.18	26.7%
0.33	76.7%		0.17	23.3%
0.32	73.3%		0.16	20.0%
0.31	70.0%		0.15	16.7%
0.30	66.7%		0.14	13.3%
0.29	63.3%		0.13	10.0%
0.28	60.0%		0.12	6.7%
0.27	56.7%		0.11	3.3%
0.26	53.3%		0.10 or below	0%
0.25	50.0%			