

22nd meeting of LDAC

Working Group 1 - Highly Migratory Stocks and Tuna RFMOs

7 March 2018, Brussels

HCRs and management measures for tropical tunas

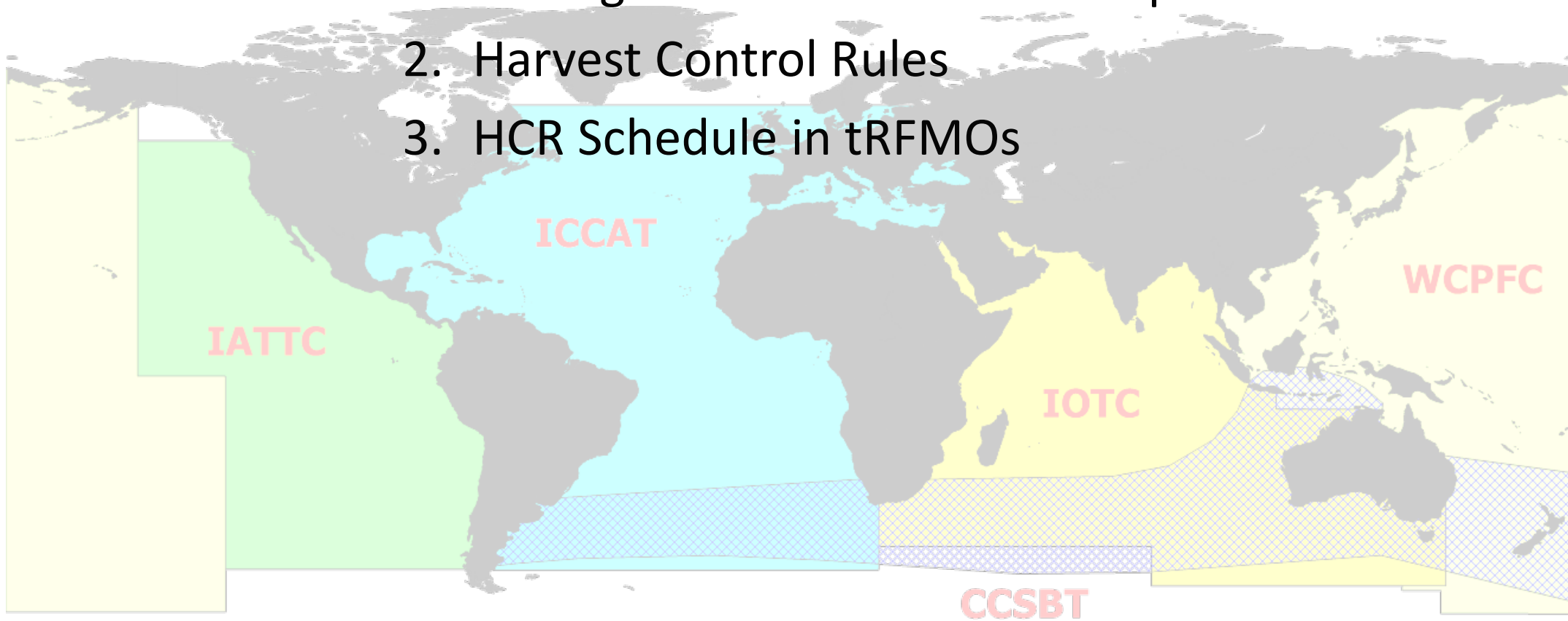
JOSU SANTIAGO

AZTI. Tuna Research Area

HCRs and management measures for tropical tunas

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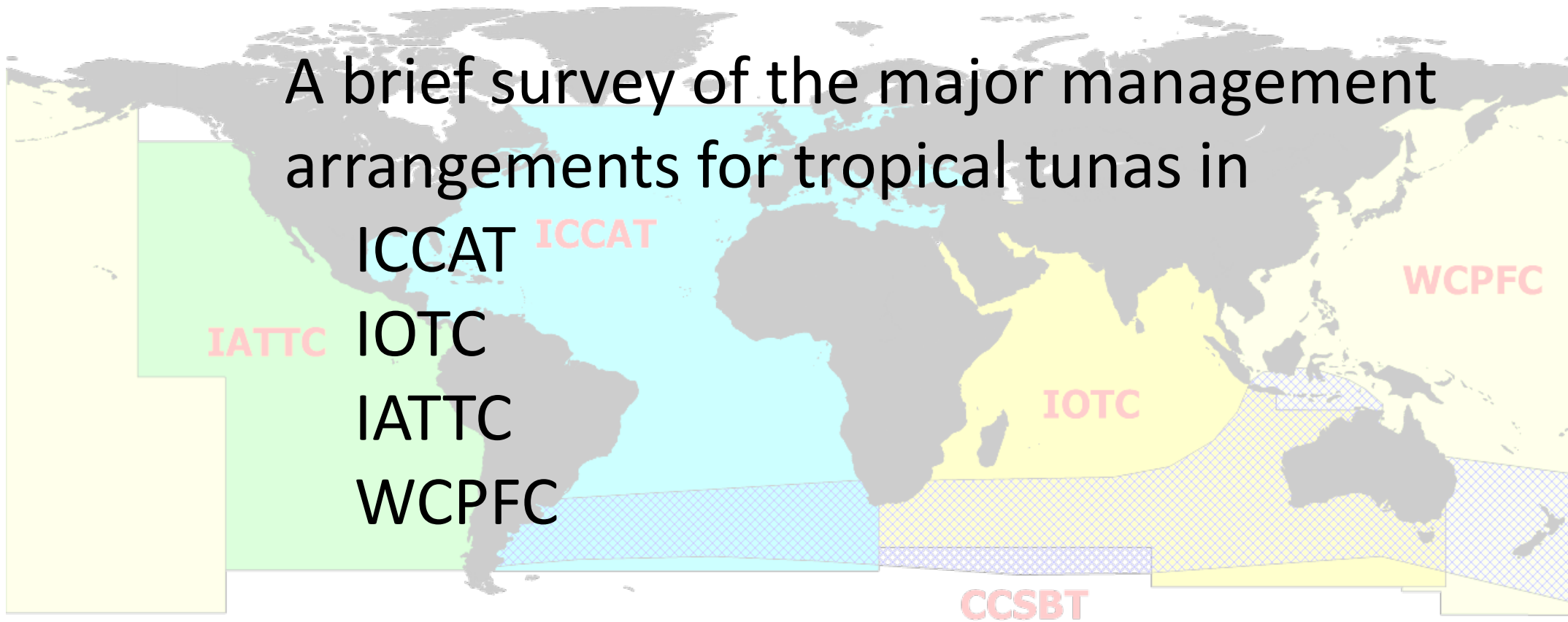
1. Management measures for tropical tunas
2. Harvest Control Rules
3. HCR Schedule in tRFMOs



https://josusb.shinyapps.io/tRFMO_TT/

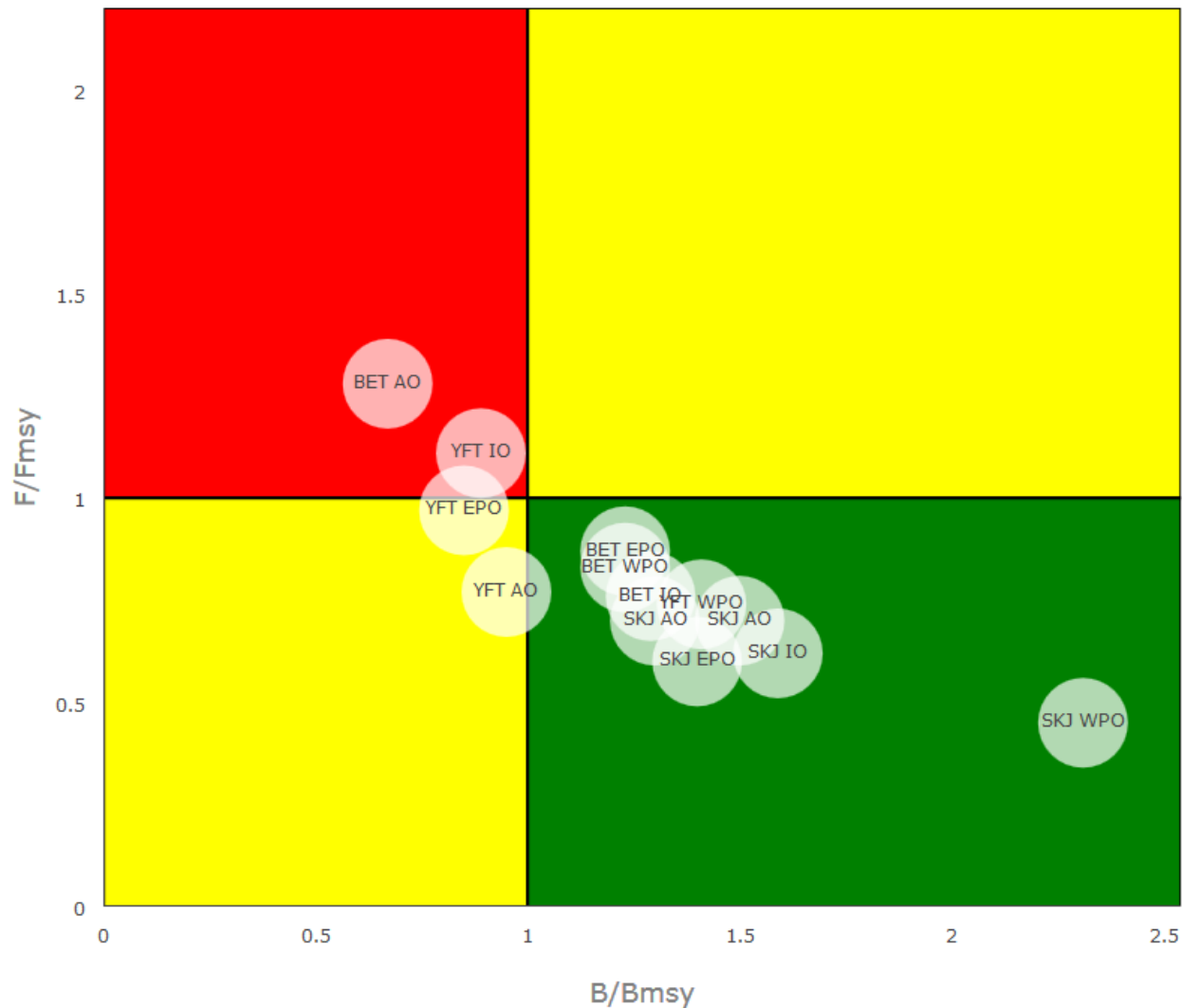
1. Management measures for tropical tunas

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1. Management measures for tropical tunas



[ICCAT Rec. 16-01] Recommendation on a Multi-annual Conservation and Management Programme for Tropical Tunas

TAC FOR BIGEYE TUNA

2. TAC for bigeye tuna: 65,000 t
3. Catch limits to the following CPCs
4. Catch limits shall not apply to CPCs whose annual catch was less than 2,100 t [in 1999]
5. CPCs shall report quarterly the amount of bigeye caught by vessels flying their flag to the Secretariat by the end of the following quarter.

TAC FOR YELLOWFIN

11. TAC for yellowfin tuna: 110,000 t

CAPACITY MANAGEMENT MEASURES

12. ... number of LL and PS vessels shall each year be subject to the following limits...

1. Management measures for tropical tunas



[ICCAT Rec. 16-01] Recommendation on a Multi-annual Conservation and Management Programme for Tropical Tunas

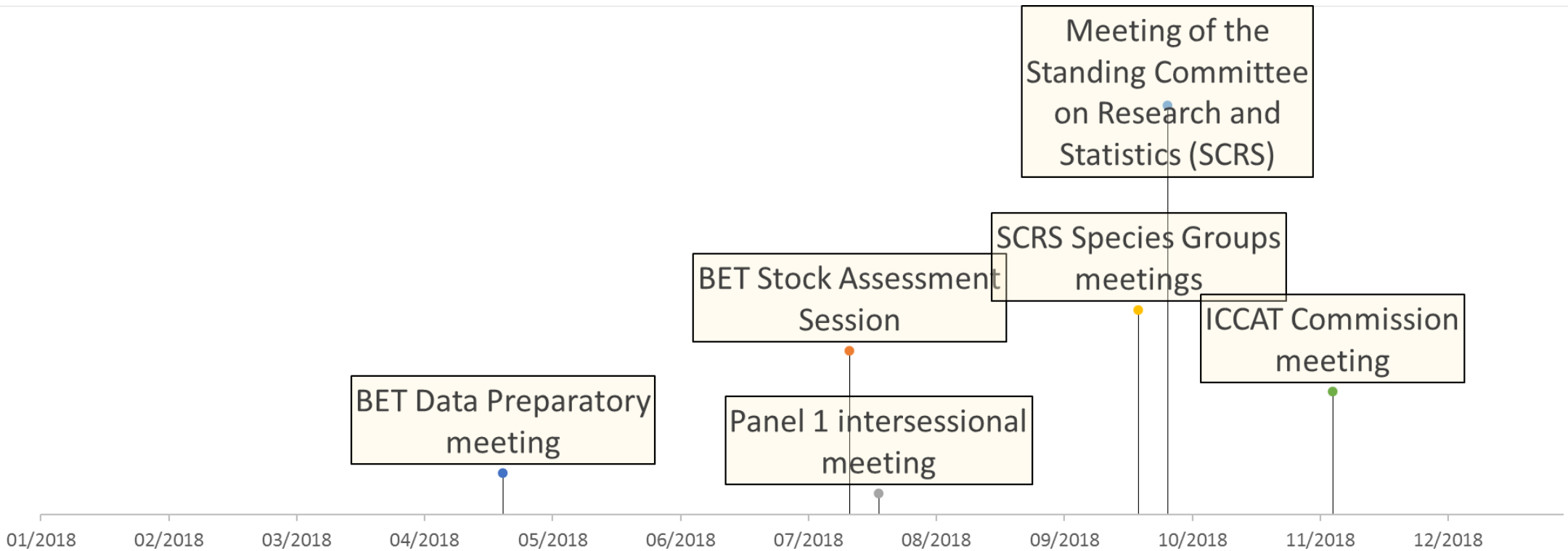
MANAGEMENT OF FADs

13. Area/Time closure in relation with the protection of juveniles. Fishing in association with objects shall be prohibited during the period 1 January to 28 February in the following area (Gulf of Guinee)
16. Limitation of FADs: No more than 500 instrumental buoys
18. FAD Management Plans
21. FAD logbook and list of deployed FADs
23. Reporting obligations on FADs and on support vessels
24. Non-entangling and biodegradable FADs
 - replace by 2016 existing FADs with non-entangling FADs.
 - undertake research to gradually replace existing FADs with fully biodegradable and non-entangling FADs, with a view to phase out non-biodegradable FADs by 2018, if possible

1. Management measures for tropical tunas



2018 schedule



BET assessment

1. Management measures for tropical tunas



[IOTC Res. 17-01] On interim plan for rebuilding the Indian Ocean yellowfin tuna stock in the IOTC area of competence

1. Apply to all fishing vessels ... of 24 meters overall
3. **Purse seine:**
 - a) CPCs whose Purse seine catches of YFT reported for 2014 were above 5000 MT to reduce their catches of yellowfin by 15 % from the 2014 levels.
 - b) The number of FADs will be no more than 350 active instrumented buoys and 700 acquired annually per PS vessel.

1. Management measures for tropical tunas



[IOTC Res. 17-01] On interim plan for rebuilding the Indian Ocean yellowfin tuna stock in the IOTC area of competence

3. Purse seine:

- c) Supply vessels: gradually reduced by 31st December 2022 :
 - i. 01/2018 - 12/2019: 1 supply vessel in support of not less than 2 purse seiners, all of the same flag State.
 - ii. 01/2020 - 12/2022: 2 supply vessels in support of not less than 5 purse seiners, all of the same flag State.
 - iii. No CPC is allowed to register any new or additional supply vessel after 2017.
- d) A single purse seine vessel shall not be supported by more than one single supply vessel of the same flag State at any point in time.
- e) report annually of operations which PSs are served by each supply vessel

1. Management measures for tropical tunas



[IOTC Res. 17-01] On interim plan for rebuilding the Indian Ocean yellowfin tuna stock in the IOTC area of competence

- 4-6. **Gillnet /longline** (reduction of 10%) /**other gears**: 5 % from the 2014 levels.
7. Flag States 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, the measures they have taken.
8. CPCs shall monitor the YFT tuna catches from their vessels
13. The provisions of paragraphs 3, 4, 5 and 6 shall be applicable to SIDS and on catches of YFT reported for 2014 or 2015

1. Management measures for tropical tunas



2018 schedule

IOTC MSE ad hoc WG

4th Technical
Committee on
Allocation Criteria
(TCAC04)

22nd Session of the
Indian Ocean Tuna
Commission (S22)

Working Party Tropical
Tuna

IOTC Scientific
Committee

01/2018 02/2018 03/2018 04/2018 05/2018 06/2018 07/2018 08/2018 09/2018 10/2018 11/2018 12/2018



YFT assessment

1. Management measures for tropical tunas



IATTC Res. 17-02: Tuna conservation in the EPO 2018-2020

MEASURES FOR PURSE-SEINE FLEETS

3. Stop fishing for a period of 72 days: 29 July to 8 October, or from 9 November to 19 January
4. Corralito: Area of 96° and 110°W and between 4°N and 3°S shall be closed from 9 October to 8 November.

1. Management measures for tropical tunas



IATTC Res. 17-02: Tuna conservation in the EPO 2018-2020

MEASURES FOR THE FISHERY ON FISH-AGGREGATING DEVICES

8. CPCs shall ensure that purse-seine vessels flying their flag have no more than the following number of FADs, active at any one time:
 - Class 6 (1,200 m³ and greater): 450 FADs
 - Class 6 (< 1,200 m³): 300 FADs
 - Class 4-5: 120 FADs
 - Class 1-3: 70 FAD
9. A FAD shall be activated exclusively onboard a purse-seine vessel.
10. Definition of active: deployed at sea; and starts transmitting ...
11. ...CPCs shall report, or require their vessels to report, daily information on all active FADs (delay of at least 60 days)
12. ... develop guidance on the reporting of FAD data

1. Management measures for tropical tunas



IATTC Res. 17-02: Tuna conservation in the EPO 2018-2020

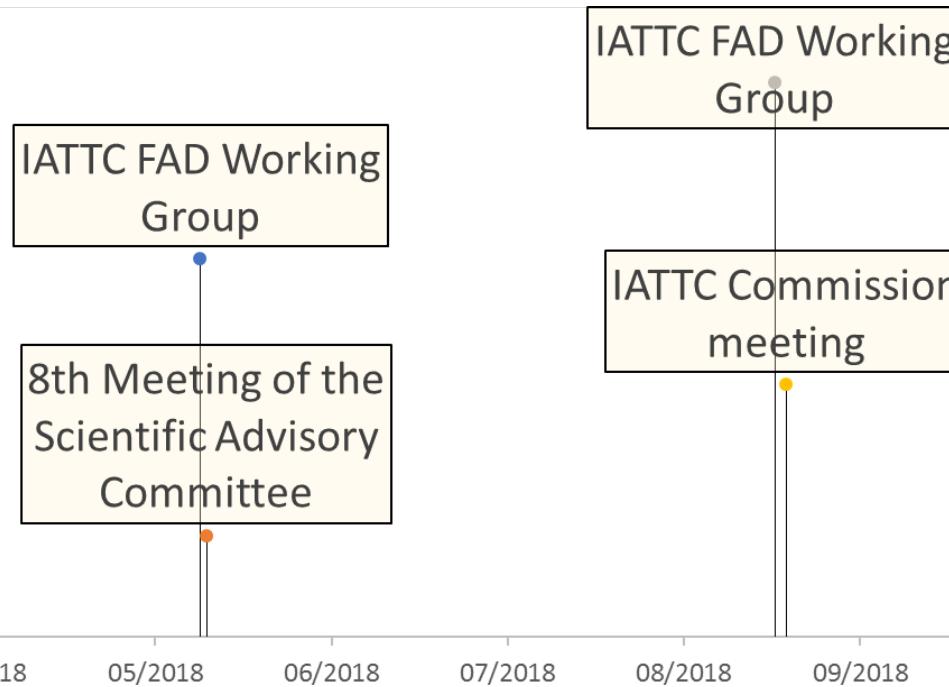
MEASURES FOR THE LONGLINE FISHERY

16. China, Japan, Korea, United States, and Chinese Taipei undertake to ensure that the TAC of bigeye tuna by their longline vessels in the Convention Area during 2018-2020 do not exceed **55,131 metric tons**, distributed at the following levels:

1. Management measures for tropical tunas



2018 schedule



BET assessment
YFT update

1. Management measures for tropical tunas



[CMM 2017-01] Conservation and Management Measure for bigeye, yellowfin and skipjack tuna in the Western and Central Pacific Ocean

HARVEST STRATEGIES AND INTERIM OBJECTIVES FOR BET, SKJ & YFT

11. bridge to the adoption of a harvest strategy for BET,SKJ & YFT
12. Pending agreement of TRP, BET $SB/SB_{F=0}$ at above the level of 2012-2015
13. SKJ consistent with the interim $TRP=50\%SB_{F=0}$
14. Pending agreement of TRP, YFT $SB/SB_{F=0}$ at above the level of 2012-2015
15. The Commission in 2018 shall review and revise the aims set out in pars 12 to 14 in light of advice from the SC.

1. Management measures for tropical tunas



[CMM 2017-01] Conservation and Management Measure for bigeye, yellowfin and skipjack tuna in the Western and Central Pacific Ocean

PURSE SEINE FISHERY

FAD set management

16. A **3-months** (July-September) prohibition of deploying, servicing or setting on FADs.
17. in the **High Seas** for **additional 2-months** (April-May or November-December)

Non-entangling FADs

19. ... CCMs are encouraged to utilise non-entangling design and materials.
20. ... the use of natural or biodegradable materials for FADs should be promoted.
21. SC shall continue to review research results on the use of non-entangling and biodegradable materials on FADs, and shall provide specific recommendations
22. The Commission at its 2018 annual session, shall consider the adoption of measures on the implementation of non-entangling and/or biodegradable materials.

1. Management measures for tropical tunas



[CMM 2017-01] Conservation and Management Measure for bigeye, yellowfin and skipjack tuna in the Western and Central Pacific Ocean

PURSE SEINE FISHERY

Instrumented Buoys

23. ... **no more than 350** FADs with activated instrumented buoys. The buoy shall be **activated exclusively on board the vessel.**

24. The Commission at its 2018 annual session, shall review whether the number of FADs deployed as set out in paragraph 23 is appropriate.

Zone-based purse seine effort control

Table 1 with effort limits (vessel days and catch limits AUS,NZ,NC)

High seas purse seine effort control

Table 2 with effort limits (vessel days) --- except SIDS and Phil (attach. 2)

Excption to American Samoa in 2018: 100 vessel days from EEZ to HS

1. Management measures for tropical tunas



[CMM 2017-01] Conservation and Management Measure for bigeye, yellowfin and skipjack tuna in the Western and Central Pacific Ocean

PURSE SEINE FISHERY

Exclusive Economic Zones

20. PNA coastal states shall **restrict the level of purse seine effort** in their EEZs to 2010 levels through the PNA Vessel Days Scheme.

Catch retention

Monitoring and Control

Research on BET & YFT

1. Management measures for tropical tunas



[CMM 2017-01] Conservation and Management Measure for bigeye, yellowfin and skipjack tuna in the Western and Central Pacific Ocean

LONGLINE FISHERY

39. ...interim measure, ... restrict the level of BET catch to the levels specified in Table 3.
40. The Commission shall review the BET catch limits in 2018 and 2019

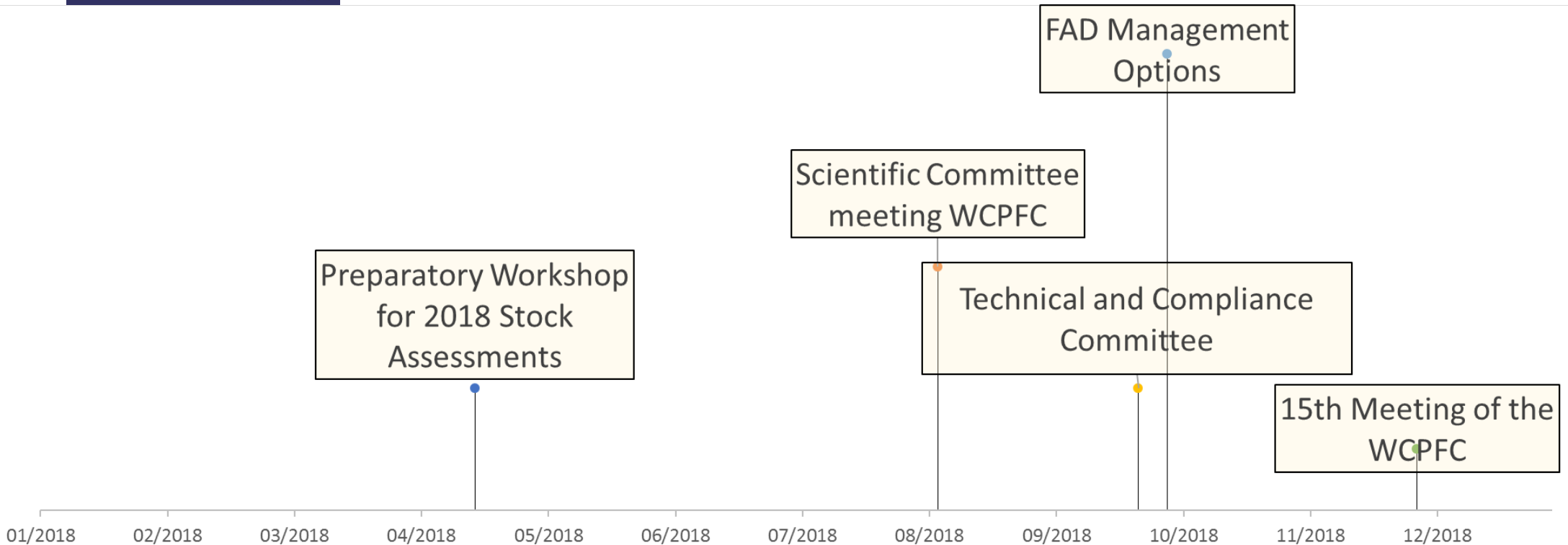
CAPACITY MANAGEMENT FOR PURSE SEINE AND LONGLINE VESSELS

45. CCMs, other than SIDS and Indonesia, shall keep the number of PSs to the applicable level under CMM 2013-01.
47. CCMs, other than SIDS and Indonesia, shall not increase the number of their LL targeting BET above the applicable level under CMM 2013-01

1. Management measures for tropical tunas



2018 schedule



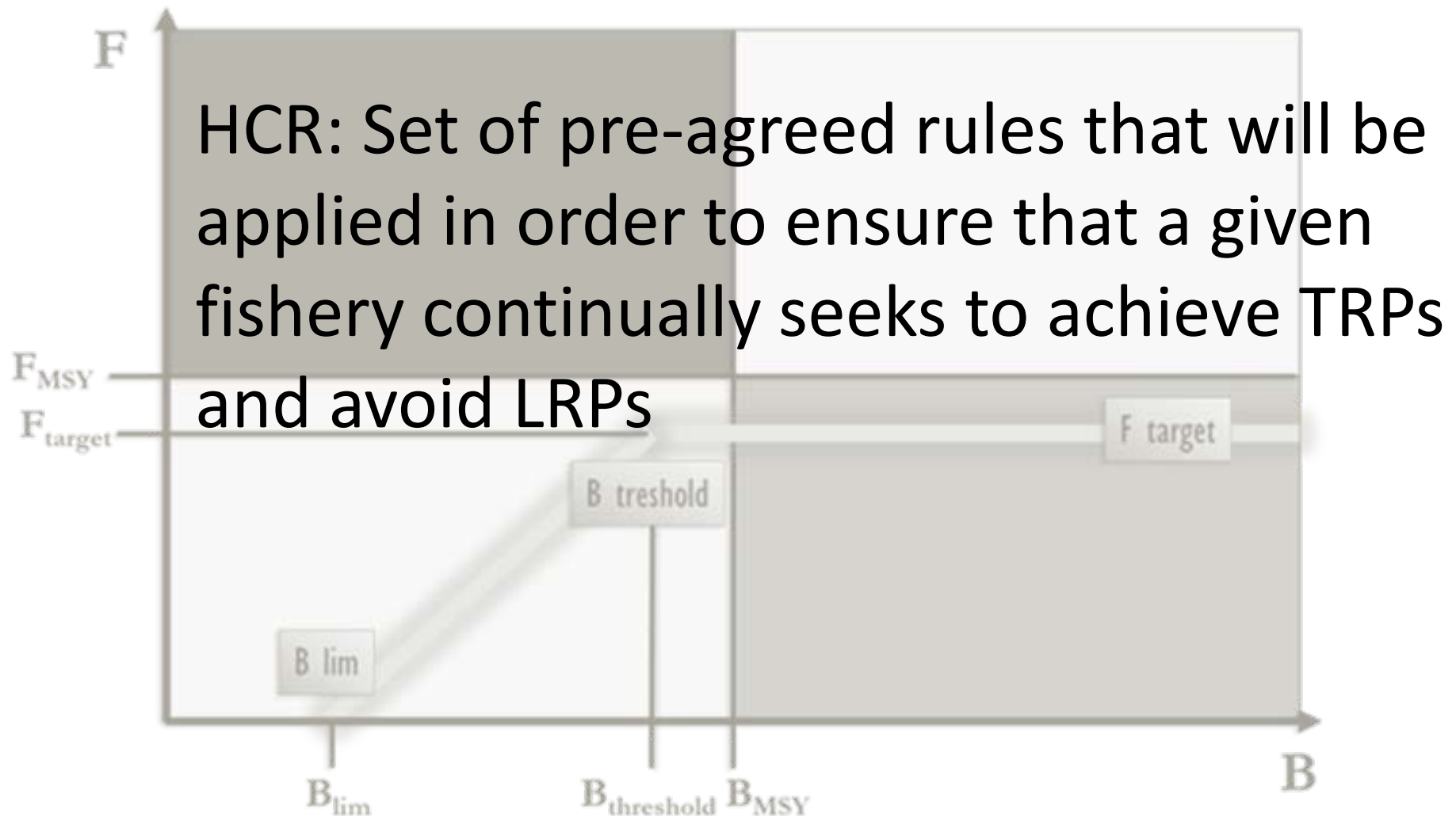
implications of updated growth analyses for bigeye on stock status

1. Management measures for tropical tunas

tRFMO	IATTC	ICCAT	IOTC	WCPFC
TAC or catch limits for LL	BET			BET
TAC or catch limits all gears		BET/YFT	YFT	
Fleet capacity limits	X	X	X	X
Limit supply vessels	X		X	
PS effort control	X (72d)			X (vessel days)
PS Time-area closure	X (1m)			
FAD specific measures				
Marking of FADs	X		X	X
FAD Time closure				X (3 m)
FAD Time-area closure		X (1m)		X (HS 2 m)
Number of FADs	X	X	X	X
Buoy purchases			X	
Activation exclusively onboard	X		X	X
FAD deployment Time closure	X (15d)			
FAD recovery	X (15d)			
Non entangling	X (2019)	X (2016)	X (2014)	-
Other measures				
PS Full retention	X	X	X	X
PS Transshipment at sea	X	X	X	X

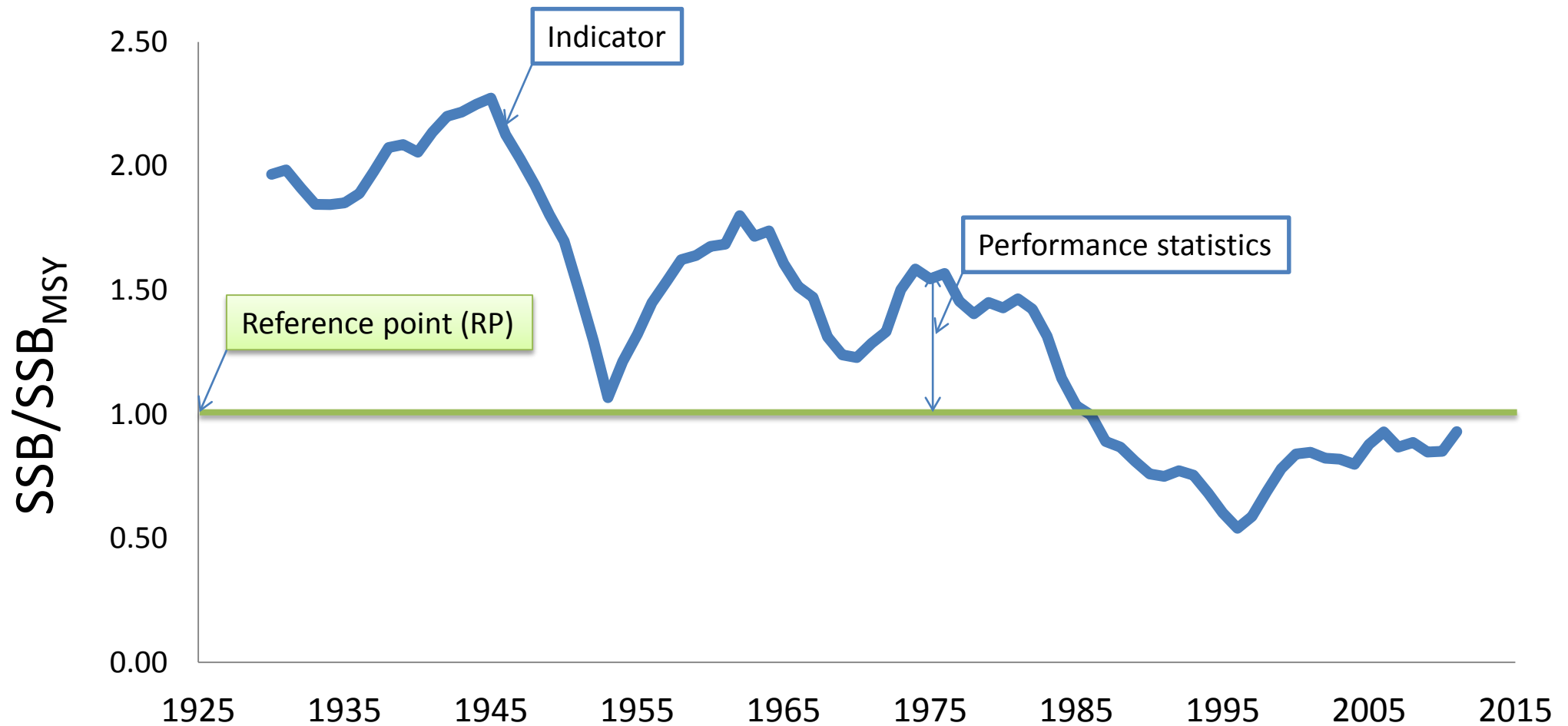
2. Harvest Control Rules

2. Harvest Control Rules (HCR)



2. Harvest Control Rules

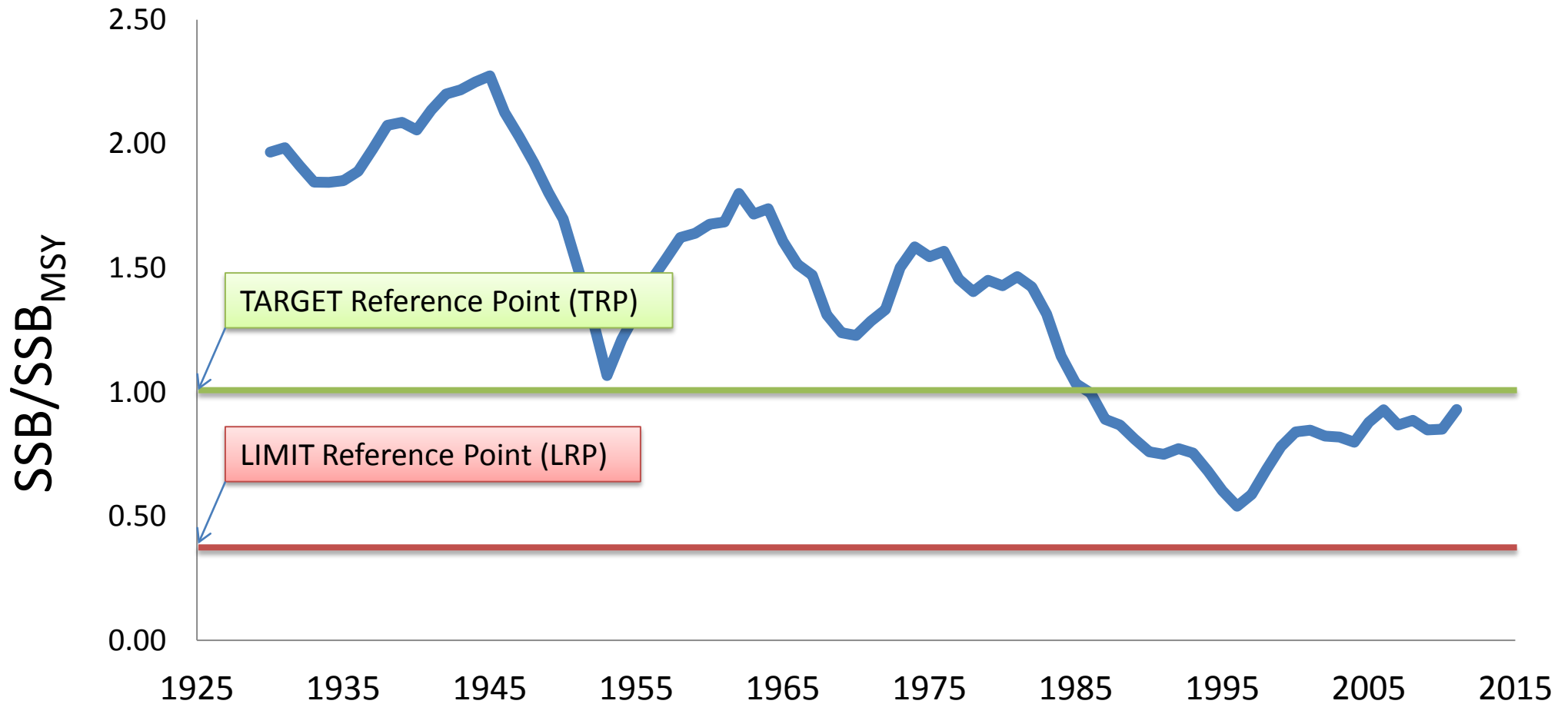
Reference points



Reference Point is a **pre-determined** level of a given indicator that corresponds to a particular state of the stock that management either seeks to achieve (TRP) or avoid (LRP).

2. Harvest Control Rules

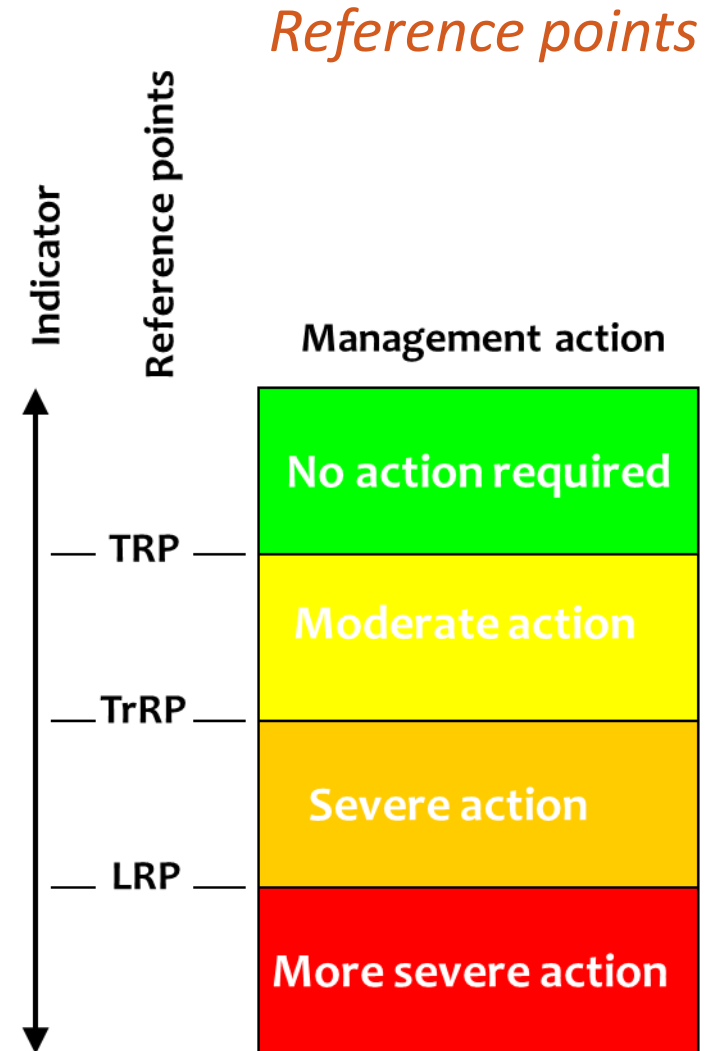
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Reference Point is a **pre-determined** level of a given indicator that corresponds to a particular state of the stock that management either seeks to achieve (TRP) or avoid (LRP).

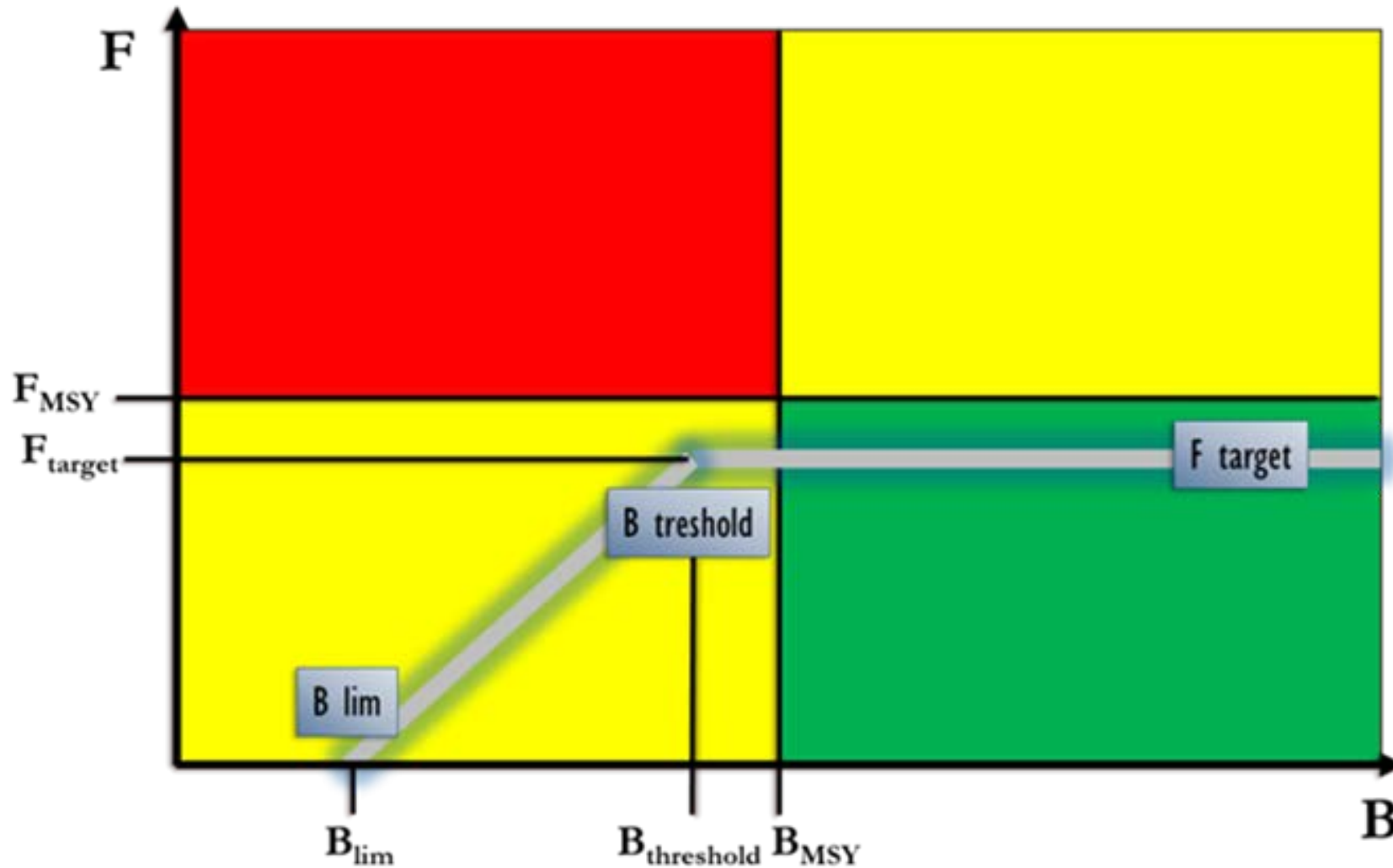
2. Harvest Control Rules

- RPs are guidelines for management; can be:
 - exploitation rates or biomass based;
 - model or empirical based
- **Target Reference Points (TRPs):** values for stock size and/or fishing mortality rate that a manager aims to **achieve and maintain**.
- **Threshold Reference Points (TrRPs)**, which identify a predefined management response.
- **Limit Reference Points (LRPs)**, which describe an undesirable state of the indicator that should be **avoided** with high probability.



2. Harvest Control Rules

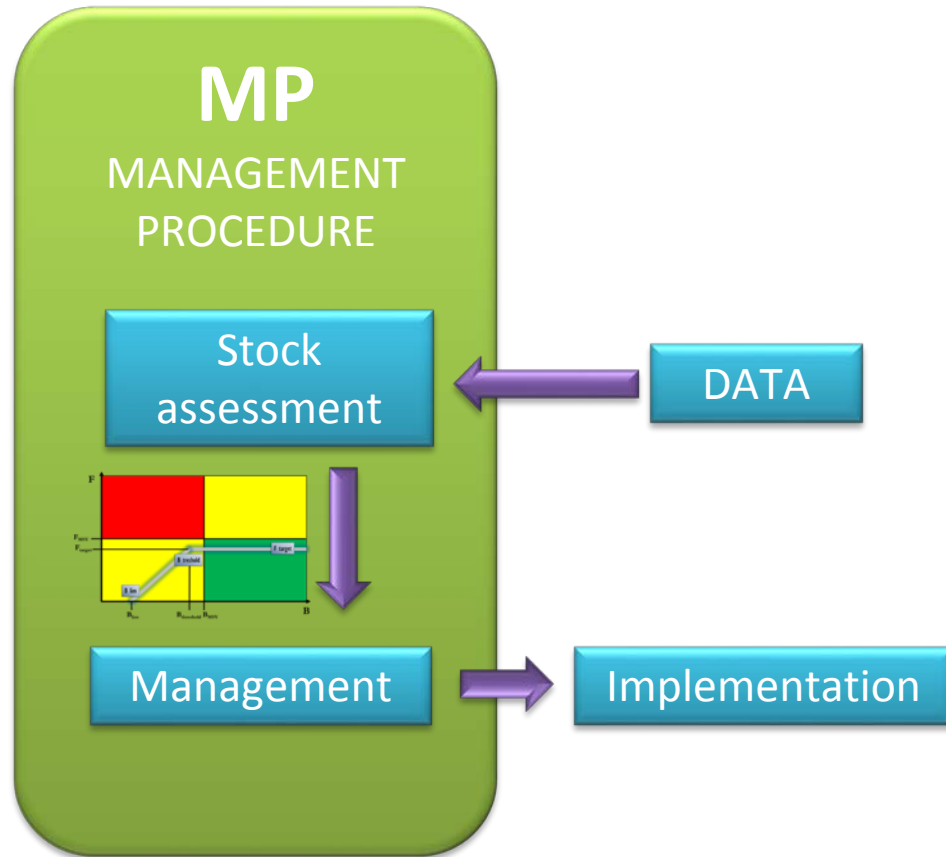
Harvest Control Rule



- RP are only relevant if placed as **part of harvest strategies** or decision rules pre-agreed (HCR).

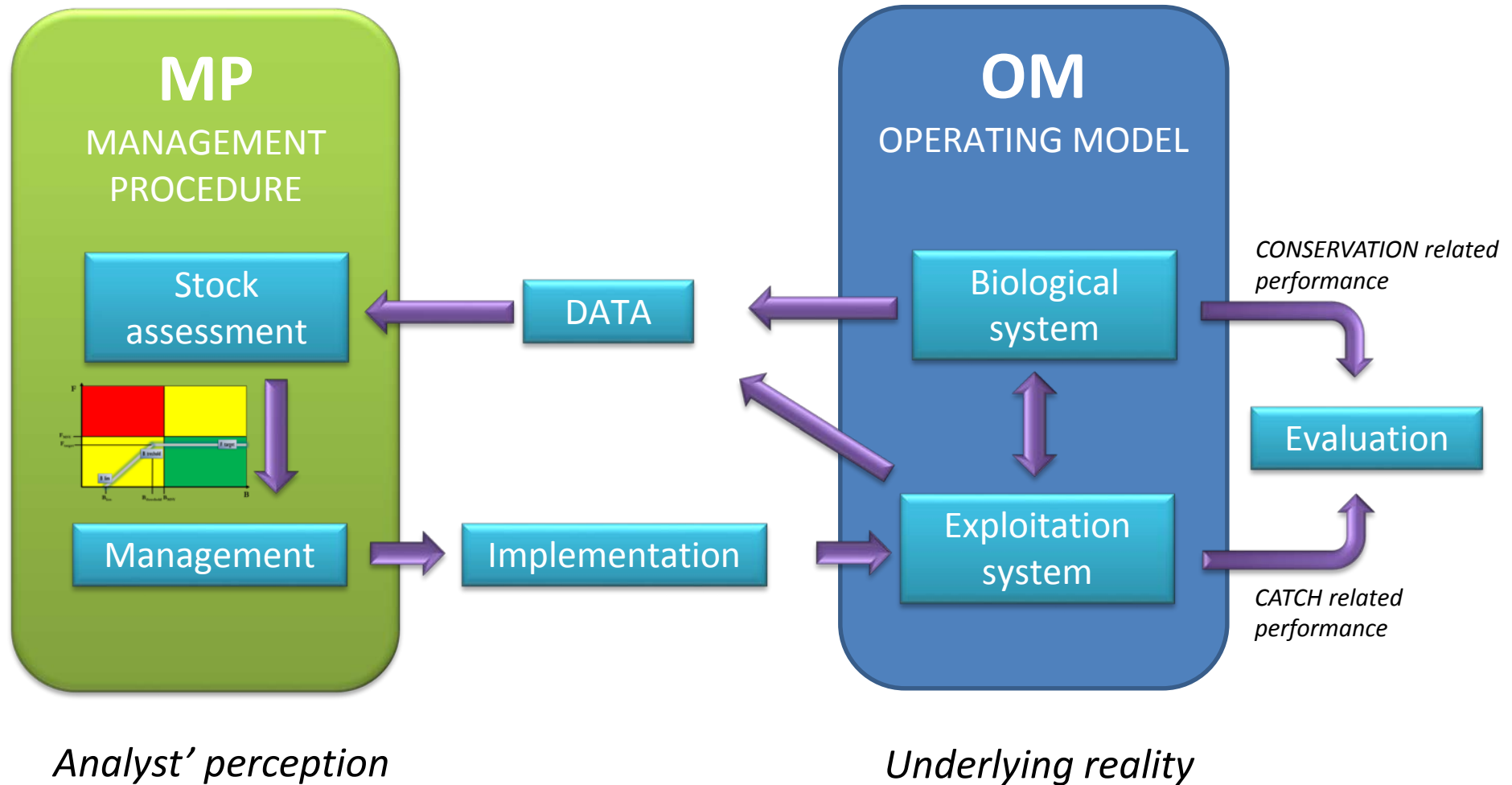
2. Harvest Control Rules

Management procedure



2. Harvest Control Rules

*Management Strategy
Evaluation [MSE]*



3. HCR Schedule in tRFMOs

RFMO	Stocks	Adopted biomass LRP	B-LRP relative to B_0	Adopted TRP	HCR
CCSBT	SBT	-	-	-	Yes
IATTC	BET/YFT	$B_{0.5R0}$	0.08	B_{MSY} / F_{MSY}	Yes
	BET-YFT-SKJ				Yes
ICCAT	ALB-N	$0.40 B_{MSY}$	0.15	$0.8 F_{MSY}$ [$B_{THRESH}=B_{MSY}$]	Yes
IOTC	BET	$0.50 B_{MSY} - 1.30F_{MSY}$	0.14	B_{MSY} / F_{MSY}	
	ALB-YFT-SWO	$0.40 B_{MSY} - 1.40F_{MSY}$	-	B_{MSY} / F_{MSY}	
	SKJ	$0.20 SB_{F=0}$	0.20	$0.4 SB_{F=0}$	Yes
WCPFC	BET	$0.20 SB_{F=0}$	0.20	-	
	SKJ	$0.20 SB_{F=0}$	0.20	$0.5 SB_{F=0}$	
	YFT	$0.20 SB_{F=0}$	0.20	-	
	ALB-S	$0.20 SB_{F=0}$	0.20	-	
	ALB-N	$0.20 SB_{F=0}$	0.20	-	

3. HCR Schedule in tRFMOs

15-07

GEN

**RECOMMENDATION BY ICCAT ON THE DEVELOPMENT OF
HARVEST CONTROL RULES AND OF MANAGEMENT STRATEGY EVALUATION**

3. As first steps of MSE implementation for a specific stock, the Commission shall provide guidance to the SCRS. Therefore, **beginning in 2016** and consistent with priorities to be agreed by the Commission in light of the SCRS work program, the relevant **ICCAT Panels** will identify the following **management inputs** on a stock-by-stock basis, for, *inter alia*, northern albacore, bluefin tuna, North Atlantic swordfish, and tropical tunas:

4. As the next steps in MSE implementation and taking into account the inputs mentioned above, **as soon as feasible** for stocks subject to assessment and where possible, the **SCRS shall advise the Commission on options for limit, target and threshold reference points and associated HCRs**. In 2016, the SCRS will start by evaluating candidate HCRs during the assessment process planned for the northern albacore stock and will provide the Commission with a **5-year schedule for the establishment of species-specific HCRs**.

3. HCR Schedule in tRFMOs



Species	2018				2019				2020				2021			
	ALB-N	BFT	SWO-N	TROP	ALB-N	BFT	SWO-N	TROP	ALB-N	BFT	SWO-N	TROP	ALB-N	BFT	SWO-N	TROP
Development of OM framework			X	X												
Conditioning of OM				X								X				X
Development of OM alternatives			X				X									
Finalization of diagnostics and improvements of MP evaluations	X															
Re-evaluation of performance of MPS in light of definition of exceptional circumstances	X															
Development of MPs		X			X	X	X	X								X
Evaluation of MPs		X				X	X		X			X				X
Independent review of MSE process	X	X							X		X	X				
Production of documentation for stakeholders explaining results of MSE						X			X		X					X
Coordination across species	X	X	X	X	X	X	X	X	X		X	X	X			X

3. HCR Schedule in tRFMOs

1. Evaluación de estrategias de ordenación (EEO) para los atunes tropicales en el OPO 1. Management Strategy Evaluation (MSE) for tropical tunas in the EPO

Objetivo:

- Identificar regla de control de extracción (RCE) apropiada para la ordenación de los atunes patudo y aleta amarilla

Base: C-16-02

Productos:

- Informe sumario de resultados para el Comité Científico Asesor
- Propuestas de puntos de referencia y RCE, con estadísticas de evaluación

Beneficios de ordenación: RCE probada para la ordenación sostenible de las poblaciones

Presupuesto: US\$ 162,000

Objective:

- Identify appropriate harvest control rule (HCR) for management of bigeye and yellowfin tunas

Basis: C-16-02

Deliverables:

- Summary report of results for Scientific Advisory Committee
- Proposals for reference points and HCR, with evaluation statistics

Management benefit: Tested HCR for sustainable management of stocks

Budget: US\$ 162,000



3. HCR Schedule in tRFMOs



South Pacific Albacore	2015	2016	2017	2018	2019	2020	2021
Agree Target Reference Point				█			
Commission considered management objectives for the fishery or stock		█					
Performance indicators and Monitoring strategy		█	█				
Develop harvest control rules and MSE					█	█	█
Adopt HCR							█

Skipjack	2015	2016	2017	2018	2019	2020	2021
Agree Target Reference Point	█						
Commission considered management objectives for the fishery or stock		█					
Performance indicators and Monitoring strategy		█					
Develop harvest control rules and MSE			█	█	█	█	
Adopt HCR						█	

3. HCR Schedule in tRFMOs



Bigeye	2015	2016	2017	2018	2019	2020	2021
Agree Target Reference Point					█		
Commission considered management objectives for the fishery or stock		█					
Performance indicators and Monitoring strategy			█	█			
Develop harvest control rules and MSE					█	█	█
Adopt HCR							█

Yellowfin	2015	2016	2017	2018	2019	2020	2021
Agree Target Reference Point					█		
Commission considered management objectives for the fishery or stock		█					
Performance indicators and Monitoring strategy			█	█			
Develop harvest control rules and MSE					█	█	█
Adopt HCR							█

3. HCR Schedule in tRFMOs

Albacore	2018	2019	2020
Working Parties and Scientific Committee			
Undertake MSE			
Provide advice on the performance of candidate MPs			
Technical Committee on Management Procedures			
Provide advice to COM on elements of cMPs that require a decision by the COM, including the performance of candidate MPs			
Commission			
Consider work and advice from subsidiary bodies			
Decision and adoption of an MP or provide direction to the WPs/SC on the need for further MSE of candidate or alternative MPs			

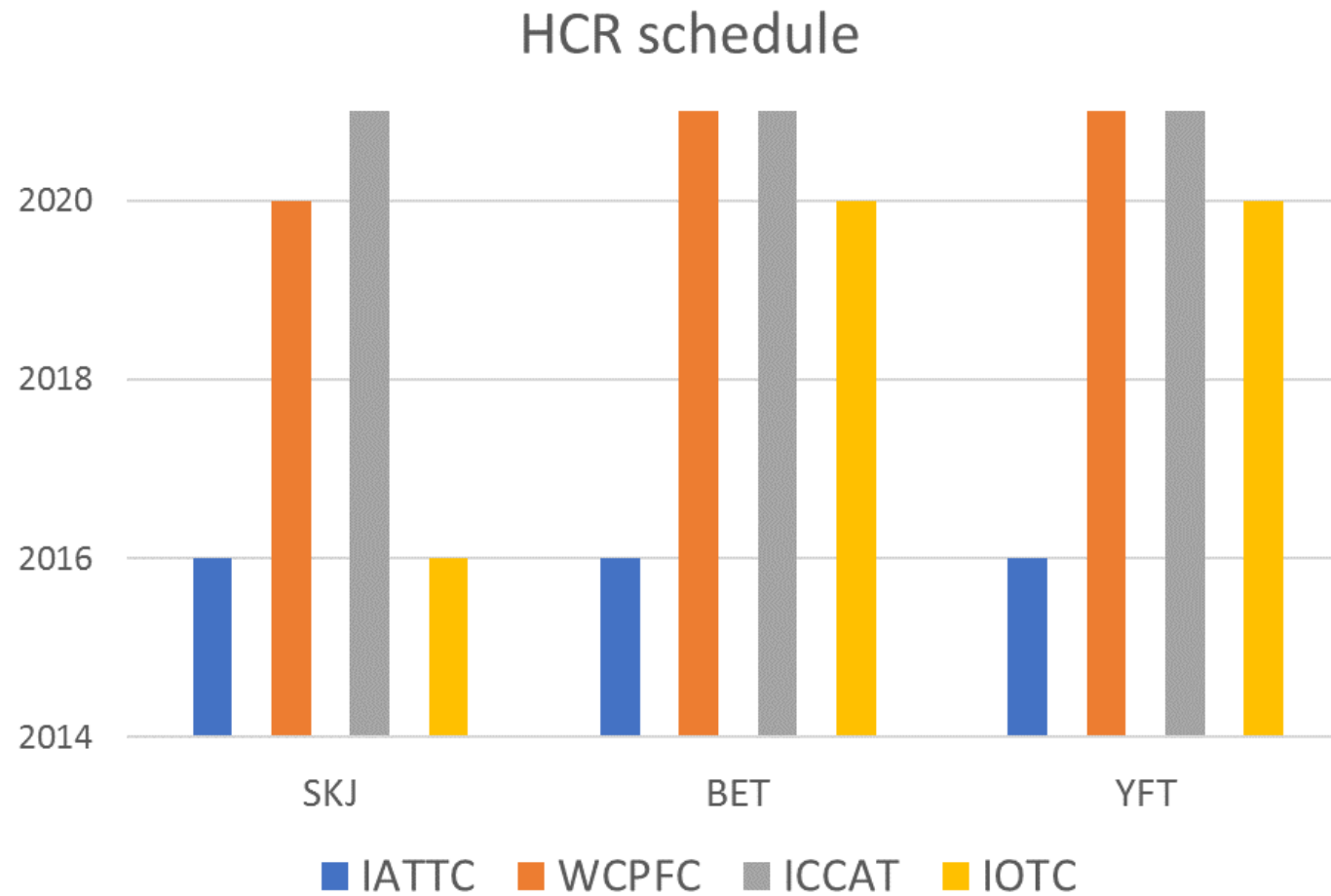
Skipjack	2018	2019	2020
Working Parties and Scientific Committee			
Further refine the HCR through MSE			
Apply HCR using results from 2020 stock assessment to calculate the TAC			
Technical Committee on Management Procedures			
Provide advice to COM on issues resulting from the application of the HCR			
Commission			
Provide direction to the WPs/SC on the need to refine the HCR and MSE			
Consider work and advice from subsidiary bodies			

3. HCR Schedule in tRFMOs

Yellowfin	2018	2019	2020
Working Parties and Scientific Committee			
Undertake MSE			
Provide advice on the performance of candidate MPs			
Technical Committee on Management Procedures			
Provide advice to COM on elements of cMPs that require a decision by the COM, including the performance of candidate MPs			
Commission			
Consider work and advice from subsidiary bodies			
Decision and adoption of an MP or provide direction to the WPs/SC on the need for further MSE of candidate or alternative MPs			

Bigeye	2018	2019	2020
Working Parties and Scientific Committee			
Undertake MSE			
Provide advice on the performance of candidate MPs			
Technical Committee on Management Procedures			
Provide advice to COM on elements of cMPs that require a decision by the COM, including the performance of candidate MPs			
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3. HCR Schedule in tRFMOs

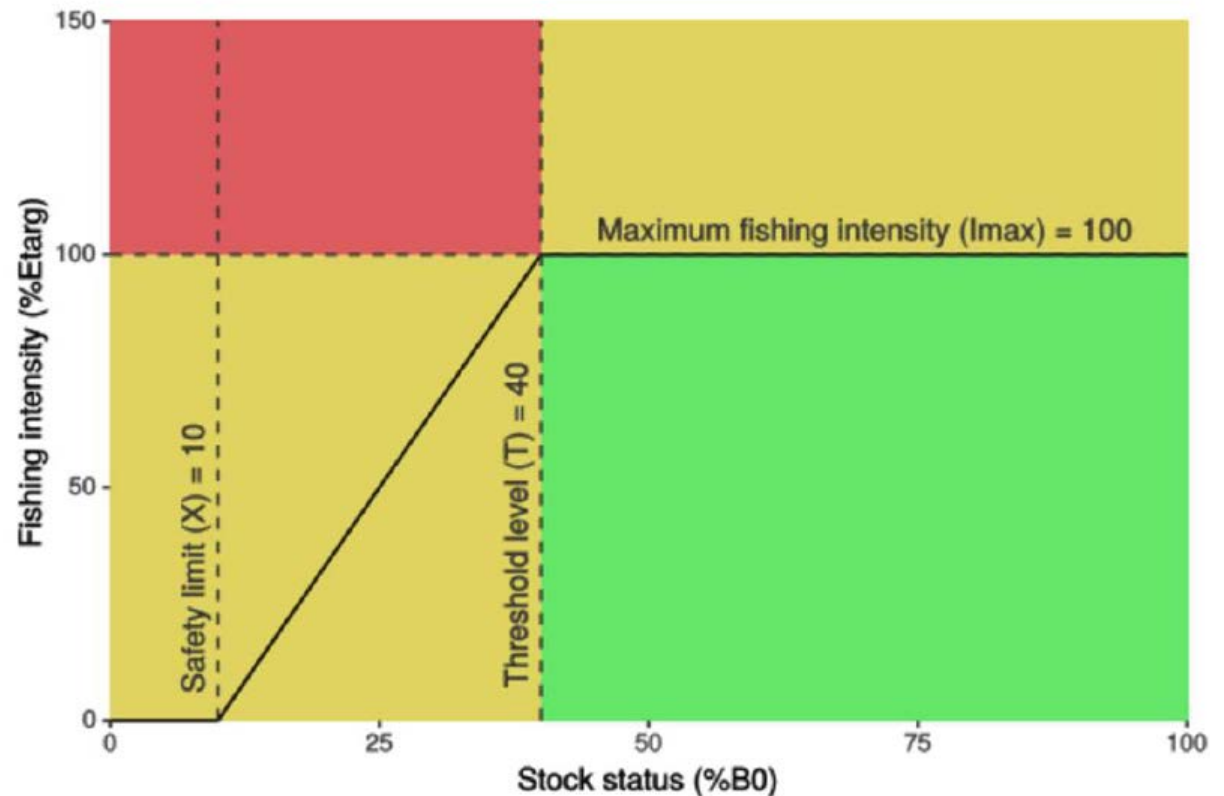


3. HCR Schedule in tRFMOs

IOTC Res. 16/02 On harvest control rules for skipjack tuna in the IOTC area of competence

HCR for IOTC SKJ:

- Threshold level: 40% B0
- Safety limit: 10% B0
- Ftar: F40%B0
- Once stock status is estimated by stock assessment (SSB), it will be applied with the HCR to estimate the F that will be used to fix TAC:
- $TAC_{SKJ} = F_{HCR} \times SSB$



3. HCR Schedule in tRFMOs

IATTC Res C-16-02. Harvest Control Rules for tropical tunas (yellowfin, bigeye, and skipjack)

HCR to prevent the fishing mortality rate (F) from exceeding the best estimate of the rate corresponding to MSY (FMSY) for the **species that requires the strictest management.**

Purse seine

$P(F > F_{lim}) > 10\%$ ----- CMM ----- $p(F \leq F_{msy}) > 50\%$ & $P(F < F_{lim}) > 10\%$
 “as son as is practical”

Other gears

$P(S > S_{lim}) > 10\%$ ----- CMM ----- $p(S \leq S_{msy}) > 50\%$ & $P(S < S_{lim}) > 10\%$
 “as son as is practical”

“... additional management measures shall be as consistent as possible with those adopted for the purse-seine fishery”