

Comisión Interamericana del Atún Tropical
Inter-American Tropical Tuna Commission



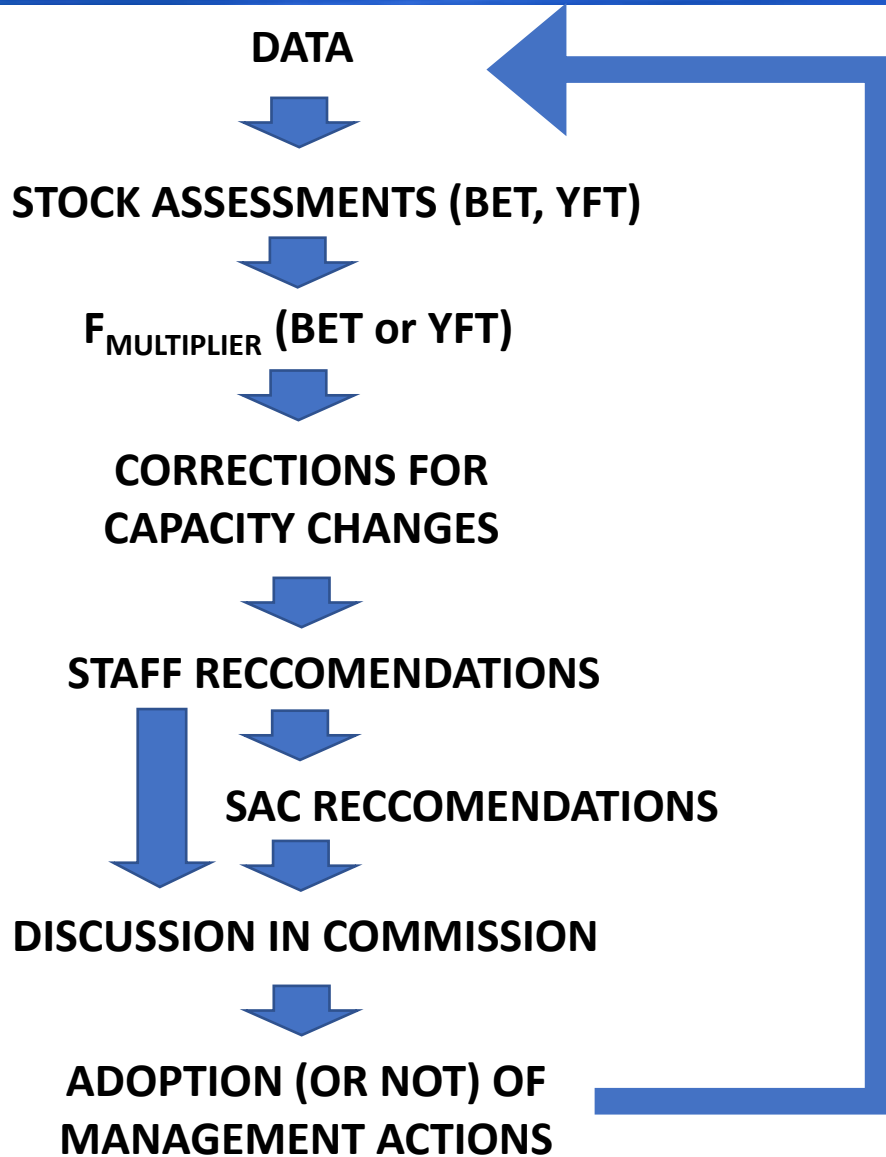
Management Strategy Evaluation for EPO tropical tunas: Workplan, Status and Next Steps
Evaluación de Estrategias de Ordenación para atunes tropicales en el OPO: Plan, Situación y pasos siguientes



3rd IATTC Tropical Tuna MSE Workshop, *by videoconference*, December 08-09, 2022



Tropical Tuna management in the IATTC



Tropical Tuna management in the IATTC

DATA



STOCK ASSESSMENTS (BET, YFT)



1. Problems with the BET assessment (2018)
2. Problems with the YFT assessment (2019)



$F_{\text{MULTIPLIER}}$ (BET or YFT)



CORRECTIONS FOR
CAPACITY CHANGES



STAFF RECCOMENDATIONS



SAC RECCOMENDATIONS



DISCUSSION IN COMMISSION



ADOPTION (OR NOT) OF
MANAGEMENT ACTIONS

Tropical Tuna management in the IATTC

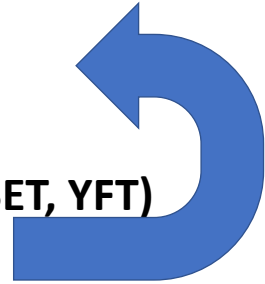
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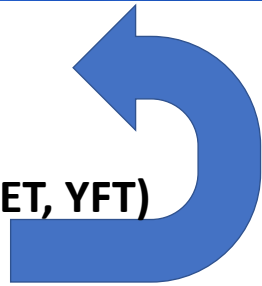
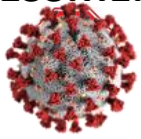
ADOPTION (OR NOT) OF
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IATTC Tropical Tuna management since 2020

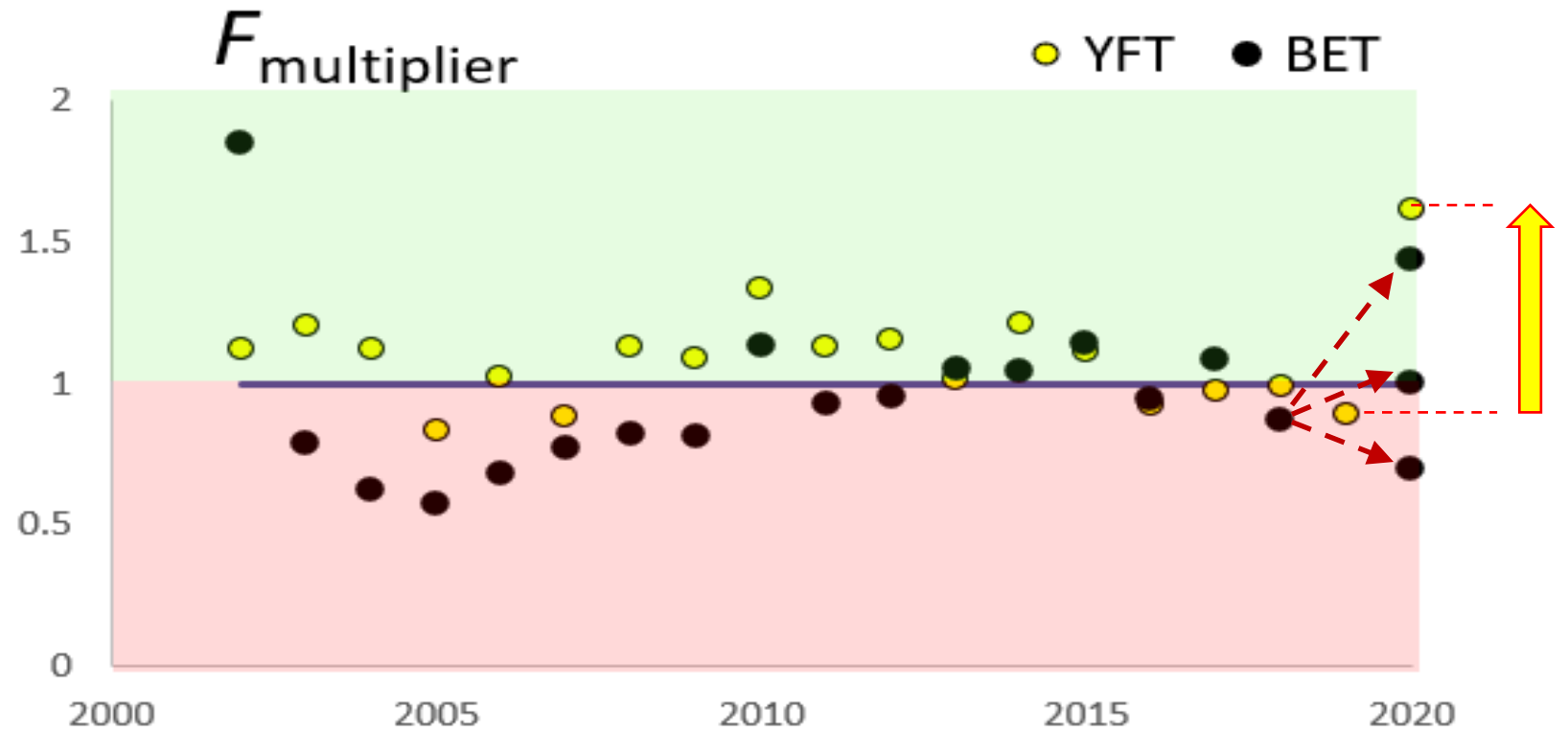
DATA



STOCK ASSESSMENTS (BET, YFT)



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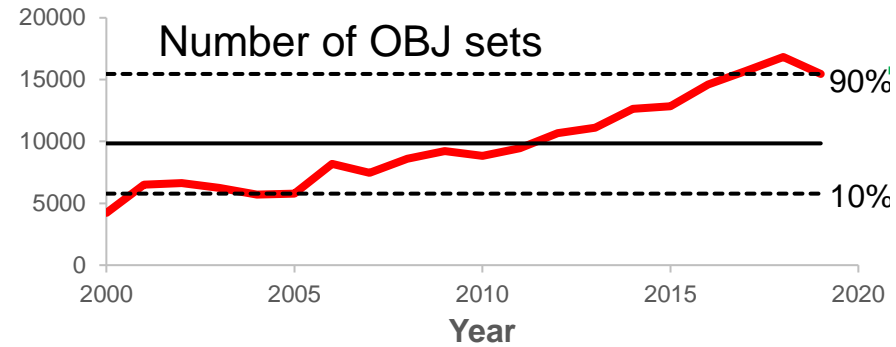
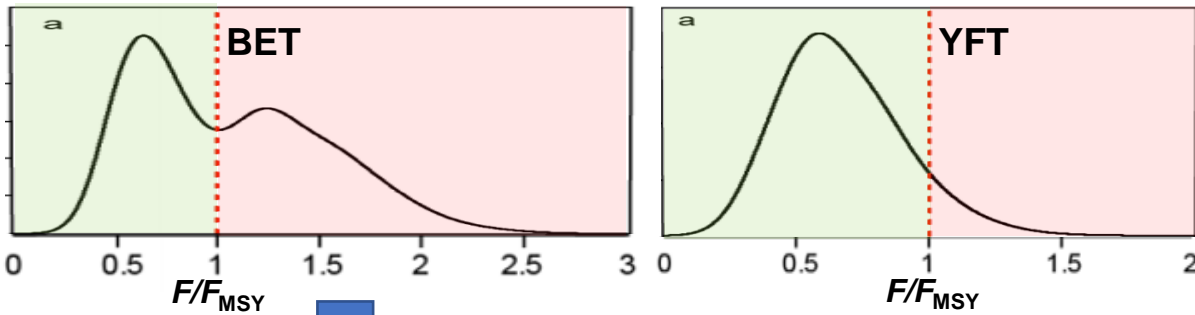


IATTC Tropical Tuna management since 2020

DATA



MULTI-MODEL STOCK ASSESSMENTS (2020)



CORRECTIONS FOR CAPACITY CHANGES



STAFF RECCOMENDATIONS

~~INCLUDING PRECAUTIONARY LIMIT ON OBJ # of SETS~~



SAC RECCOMENDATIONS



DISCUSSION IN COMMISSION



~~ADOPTION (OR NOT) OF
MANAGEMENT ACTIONS~~



ADOPTION (OR NOT) OF
MANAGEMENT ACTIONS

2022-2024 MANAGEMENT CYCLE
(72 days PS closure + BET IVL)



Current approach: some uncertainties

- The new risk analysis approach incorporates a range of stock assessment uncertainties into the BET and YFT assessments.
- Negotiations about management decisions creates management uncertainty. If objectives are not clear and the type of management measures are stable over time, the decisions are not part of a proper, complete strategy.
- The need to decide by consensus* can create political/industrial uncertainty. No guarantee appropriate management will continue once a Resolution expires.

* Article IX of Antigua requires consensus. Just 1 of the 21 members that is not in agreement is enough to halt a decision.



Relationship with Management Strategies

Management Strategies are the combination of **pre-agreed data**, **specific analyses** applied to those data and the **harvest control rule** used to determine **management measures** based on the results of those analyses (Punt et al 2016)

- In the IATTC context, data and analyses change as new research is conducted
- Management measures (e.g. closures) and other recommended management actions can change in their adoption (or not) or their implementation over time.
- Therefore, although there are elements of a Management Strategy in the IATTC, those elements could be defined and improved towards a more defined strategy, along with alternatives.

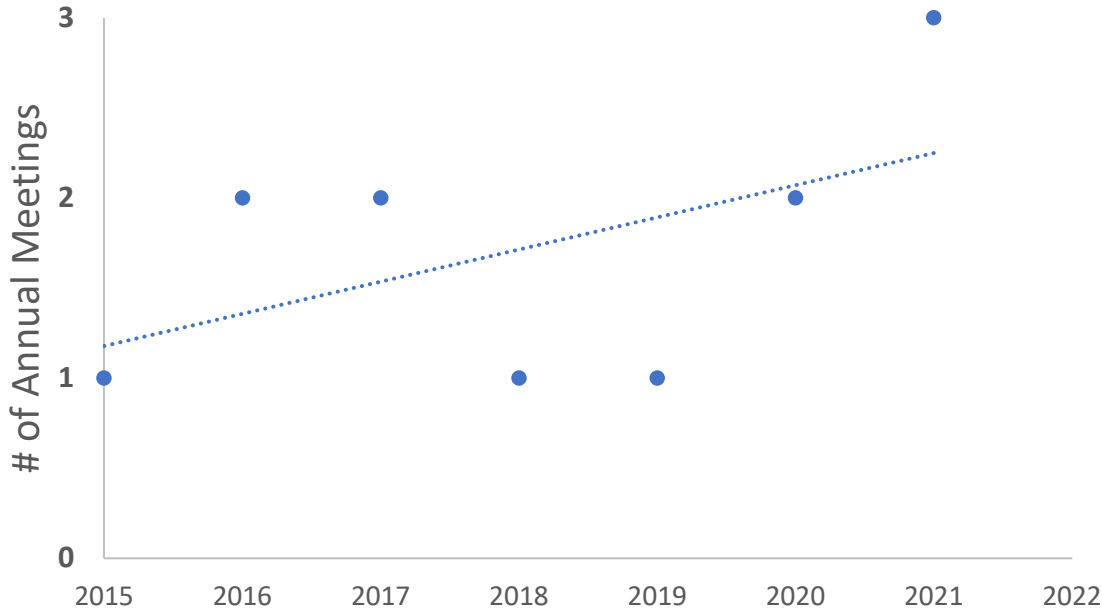
Current approach: Summary

- IATTC has many years of experience following this approach. It has worked.

Things that could be improved:

- Perception of stock can change rapidly: changes in methodology and data.
- Management inconsistencies could occur if rules / objectives not fully specified.
- Difficult to evaluate long term consequences of alternative decisions.
- Need to consider additional uncertainties, in addition to assessment uncertainty.
- Difficult to evaluate how alternative strategies achieve management objectives.
- By default, there is a tendency to a system of minimal management changes.
- The process can be contentious at times.
- Costly in the long-term: many assessments and many meetings.

Number of IATTC Annual Meetings

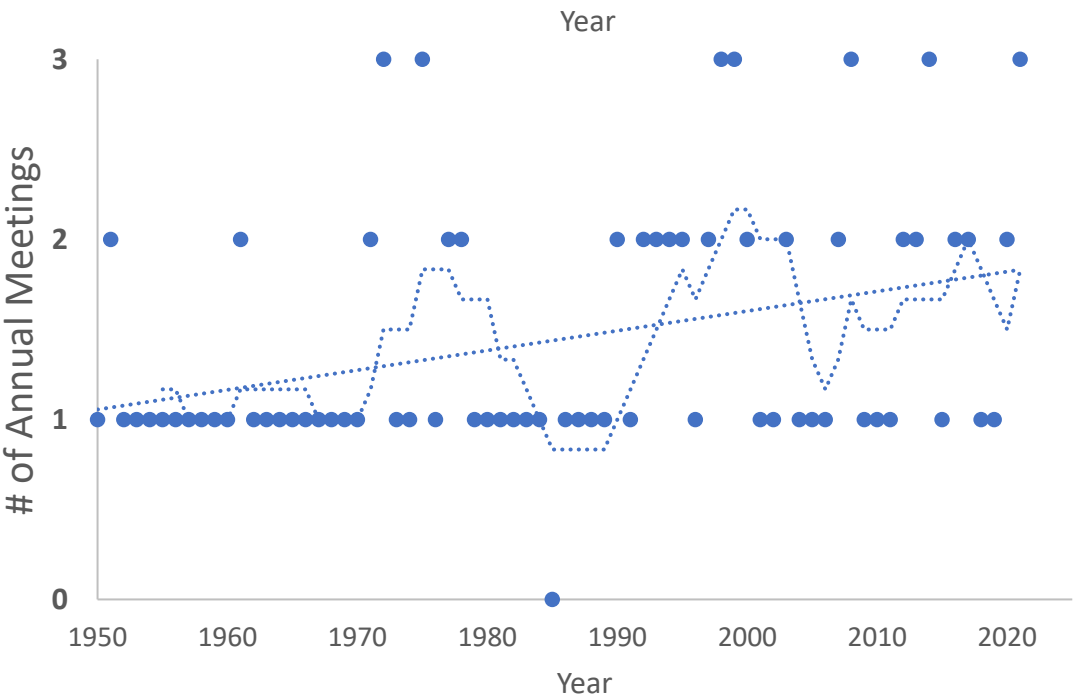


Increase in the number of annual meetings both in recent years and long-term

Difficult to reach consensus on management measures

No defined default action if no consensus

Uncertainty on the results of management cycles



Increased burden on staff, stakeholders, reduced time for strategic work, research, etc.

Rshift = 1.4

Current approach: Conclusions

Current IATTC approach

- Current IATTC tropical tuna management advice depends on stock assessments
- There were no stock assessments for SKJ tuna (new 2022 interim assessment)
- Stock assessment can have problems:
 Bigeye (2018) and yellowfin tunas (2019)
- The process is contentious and costly in the long-term: many assessments and many meetings.

Management Strategies

- IATTC adopted elements of a management strategy for tropical tunas
- Only general objectives adopted
- Complex management: several measures in addition to closures, not clear how to include these measures and alternatives in an MSE

What are Management Strategies?

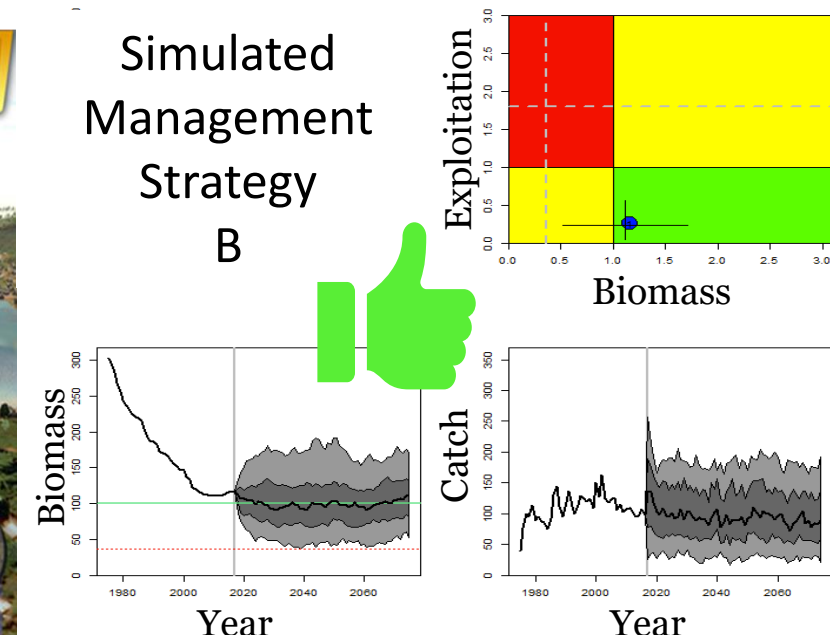
¿Que son las Estrategias de Ordenación?

- Combination of monitoring, stock status evaluation, control rule and management actions **designed to achieve fisheries objectives.**
*Combinación de monitoreo, evaluación stocks, regla de control y acciones de manejo diseñadas para lograr **objetivos de ordenación***
- Strategies can't be properly evaluated without **specific** management objectives, data, analyses, control rule, uncertainty, other components
*Estrategias no pueden ser evaluadas sin **especificar** objetivos, datos, análisis, regla de control, incertidumbre y otros componentes*
- Development and success of Management Strategies benefit from **involvement of all stakeholders** in the planning stage
*El desarrollo y éxito de Estrategias de Ordenación se benefician con el involucramiento **de todas las partes interesadas** en su planificación*
- Management Strategy Evaluation components/*Componentes de EEO*
Dialogue: define alternative strategies to evaluate/*Diálogo: definir estrategias a evaluar*
Technical: evaluate strategies via simulations/*Técnico: evaluar estrategias con simulación*

Management Strategy Evaluation (MSE)



Evaluación de Estrategias de Ordenación (EEO)

- Used to evaluate management alternatives via computer simulations: *Usadas para evaluar alternativas de ordenación vía simulación con computadoras*
- Quotas (individual, total) / *Cuotas (individuales, totales)*
- Closures (time, spatial) / *Vedas (temporales, espaciales)*
- Fishing effort limits (number of sets, FADs, etc) / *Límites de esfuerzo (núm. de lances, FADs, etc)*
- New data (tagging, ageing, genetics, etc) / *Nuevos datos (marcado, edad, genética)*
- Alternative harvest control rules / *Reglas de control alternativas*



EPO tropical tuna Management Strategy Evaluation

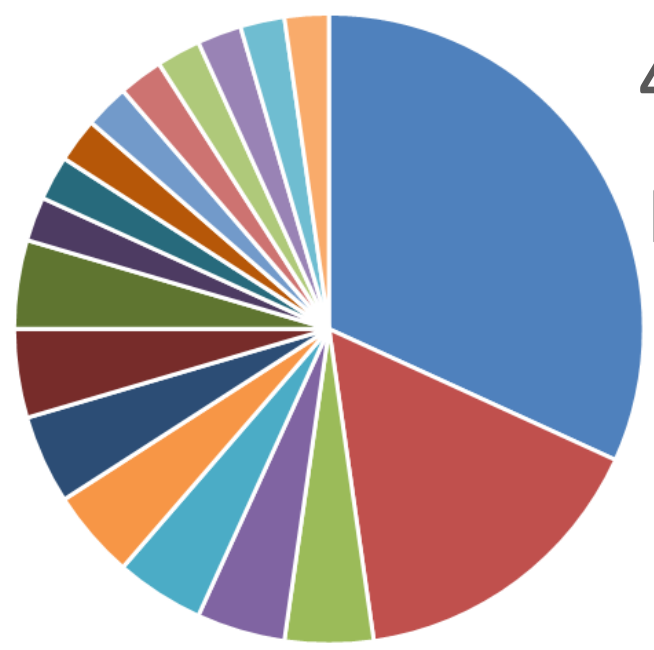
Evaluación de Estrategias de Ordenación, atunes tropicales en el OPO

- Tropical Tuna Harvest Control Rules / *Reglas de Control* ([Resolution C-16-02](#))
“...MSE is necessary to evaluate the HCR (...) and alternatives (...) to allow the Commission to adopt a permanent HCR”
“...EEO es necesaria para evaluar la RCE (...) y alternativas (...) para permitir a la Comisión adoptar una RCE permanente”
- Workshops Terms of Reference / *Términos de referencia de talleres* ([Resolution C-19-07](#))
- SAC-12 Recs. supports staff’s MSE workplan / *Apoyo del SAC a plan de EEO*
- 5-year (2018-2023) IATTC staff MSE Workplan / *Plan de EEO, 2018-2023* ([SAC-12-01](#))
- Workshops (2015-2021), 1st and 2nd IATTC MSE WS / *Talleres previos* ([WSMSE-1](#); [WSMSE-2](#))
- 2021-2023 MSE funding from the European Union
2021-2023, financiación de la Unión Europea para trabajo de EEO   European Commission
 - Two components / *Dos componentes*:
 - Consultative/dialogue process (e.g. series of MSE workshops) / *Proceso de diálogo (ej. serie de talleres)*
 - Technical implementation of MSE / *Implementación técnica de la EEO*

[1st MSE Workshop report link](#)

44 participants / *participantes*

Participant's affiliation / *Afiliación de participantes*



- IATTC
- USA
- Korea
- Ecuador
- Nicaragua
- Panama
- Costa Rica
- Guatemala
- Mexico
- Belize
- Colombia
- NGO-ISSF
- NGO-Pew
- Peru
- NGO-WWF
- Venezuela
- Japan
- Observer



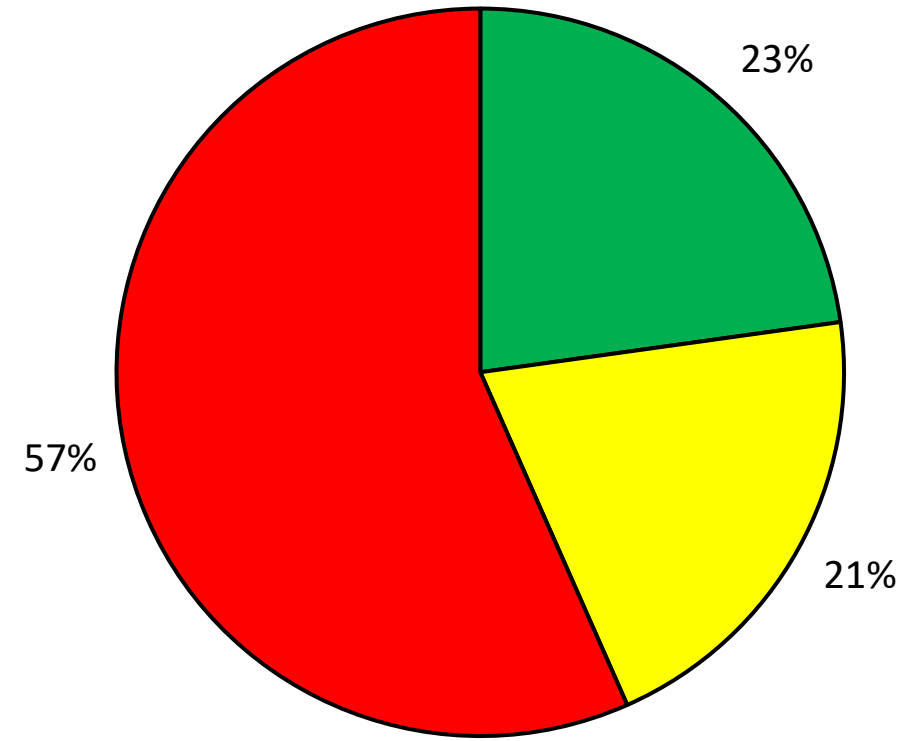
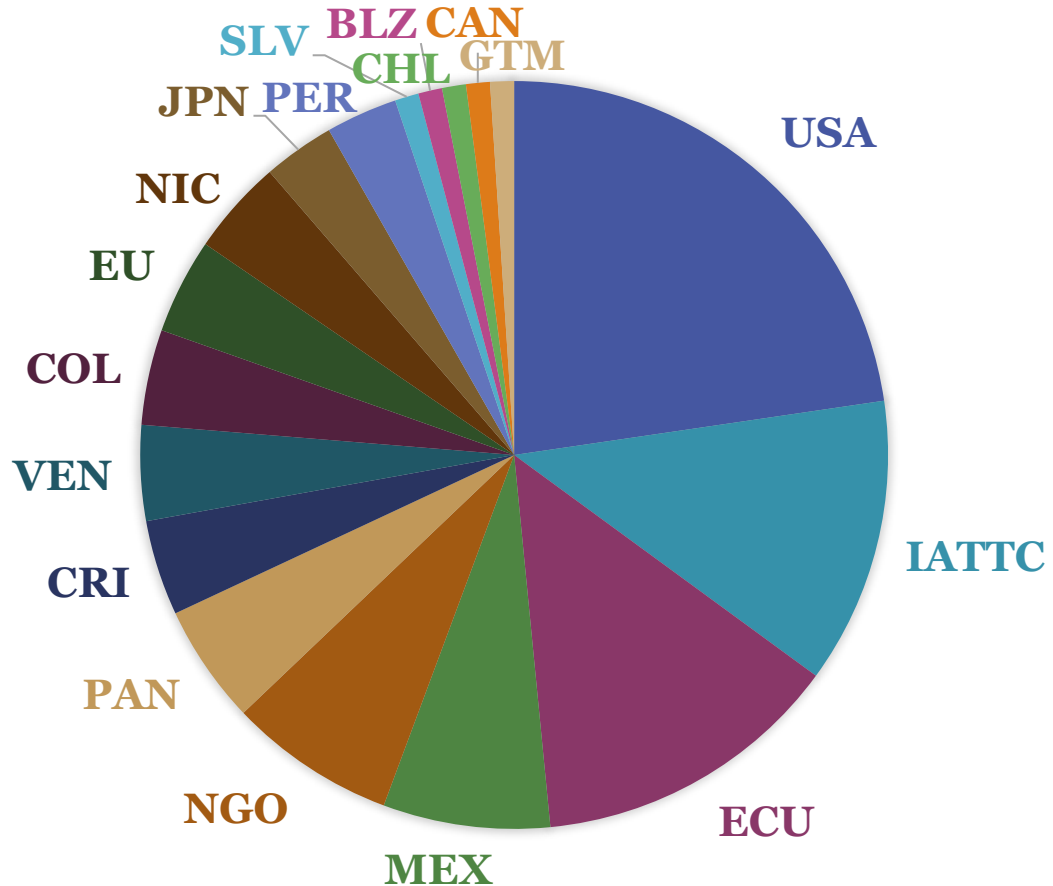
2nd IATTC Tropical Tuna MSE Workshop, April-May 2021, participants

2^{do} Taller CIAT sobre EEO, Abril-Mayo 2021, participantes

[2nd MSE Workshop report link](#)

97 participants / *participantes*

Previous EPO Tropical tuna MSE workshops
Previos talleres EEO atunes tropicales en OPO



■ 1st IATTC MSE WS
1er Taller CIAT EEO

■ Other EPO MSE WS
Otro Taller EEO en OPO

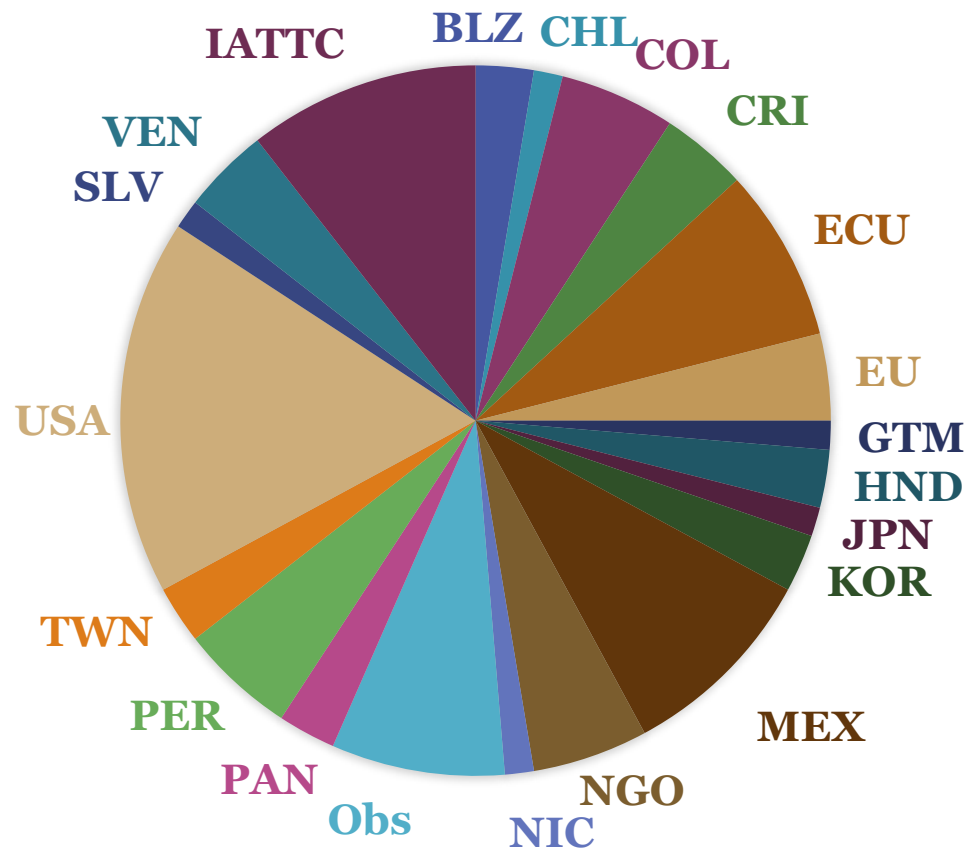
■ None
Ninguno



3rd IATTC Tropical Tuna MSE Workshop, December 2022, participants

3^{er} Taller CIAT sobre EEO, Diciembre 2022, participantes

80 participants / *participantes*

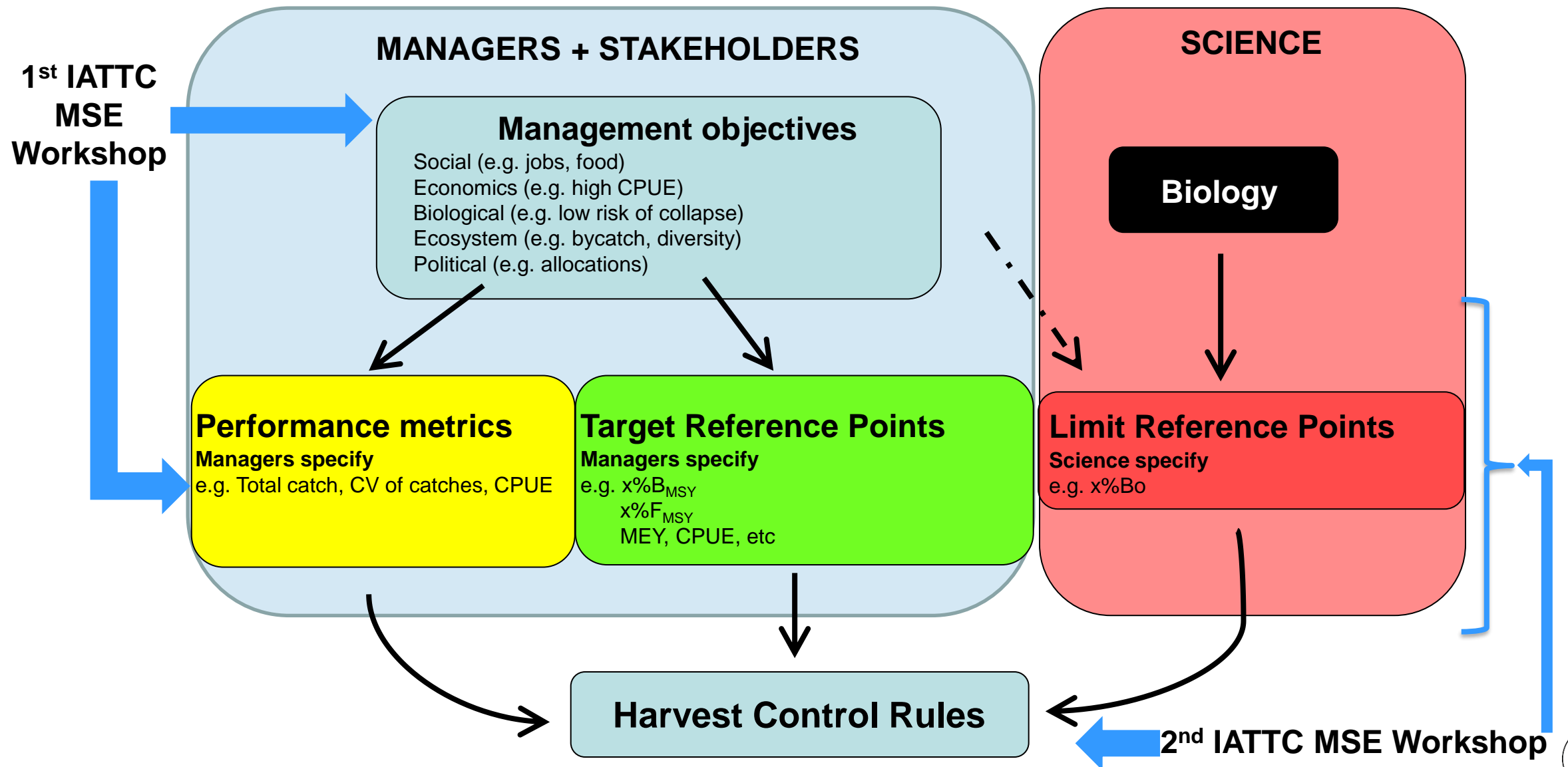


	1st MSE WS	2nd MSE WS	3rd MSE WS
Cooperating Non-Members	FALSE	FALSE	FALSE
	FALSE	TRUE	TRUE
	FALSE	FALSE	TRUE
	FALSE	FALSE	FALSE
	FALSE	FALSE	FALSE
Members	TRUE	TRUE	TRUE
	FALSE	TRUE	FALSE
	FALSE	FALSE	FALSE
	FALSE	FALSE	TRUE
	TRUE	TRUE	TRUE
	TRUE	TRUE	TRUE
	TRUE	TRUE	TRUE
	FALSE	TRUE	TRUE
	FALSE	TRUE	TRUE
	FALSE	FALSE	FALSE
	TRUE	TRUE	TRUE
	TRUE	TRUE	TRUE
	TRUE	TRUE	TRUE
	TRUE	TRUE	TRUE
	TRUE	TRUE	TRUE
FALSE	FALSE	FALSE	
TRUE	TRUE	TRUE	
Members	13	15	16
% Members	62%	71%	76%



Where we are, where we are going? Stakeholder roles

¿Donde estamos, hacia donde vamos? Roles de partes interadas

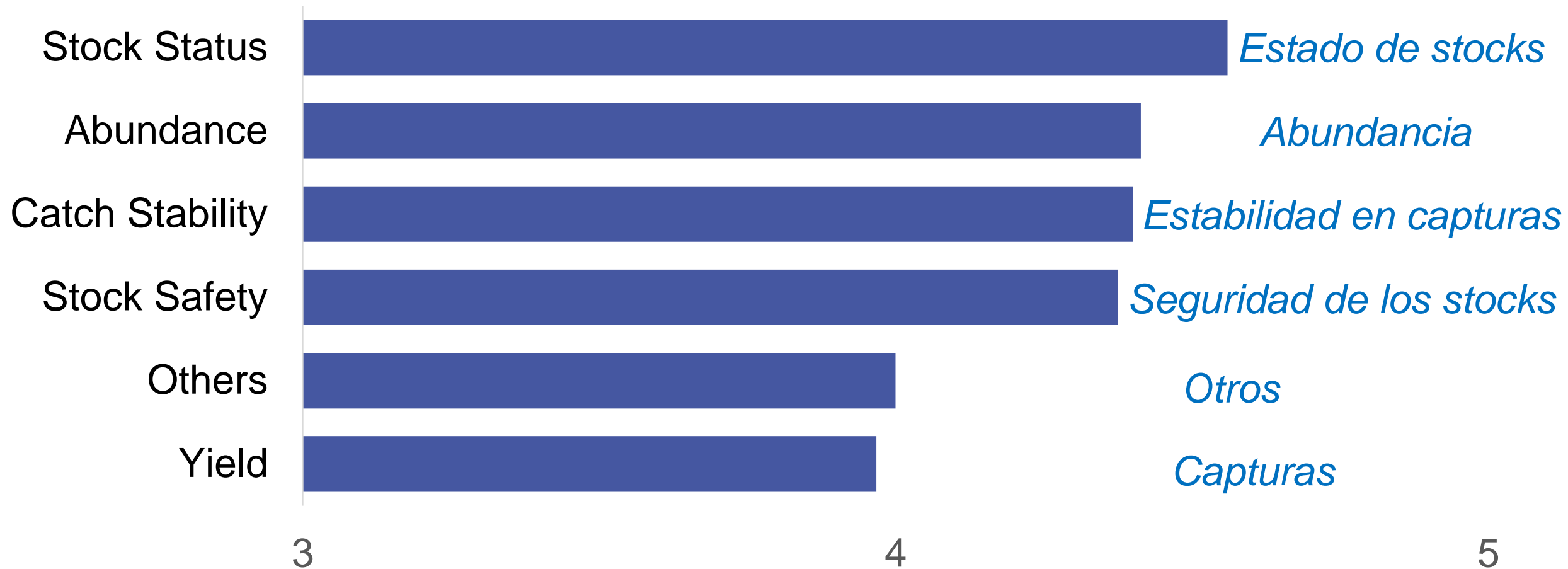


Modified from Berger et al. 2012



What types of objectives are important to you?

¿Que tipos de objetivos son importantes?



- Objectives (in progress) / *Objetivos (en progreso)*

Maintain stocks at healthy levels in the green sector of the Kobe plot with a 50% probability
Mantener poblaciones saludables en el sector verde de Kobe con 50% de probabilidad

Maintain viable fisheries in the long term (CPUE, all fisheries)
Mantener pesquerías viables en el largo plazo (CPUE, todas las pesquerías)

Maintain low annual variability of allowed catch (less than 20%) or effort (less than 10%)
Mantener baja variabilidad anual límites de captura (menos de 20%) o esfuerzo (menos de 10%)

-Gradual changes in management actions, consider asymmetry for precautionary reasons
Cambios graduales en acciones de ordenación, considerar asimetría precautoria

-Consider different lengths of management cycles
Considerar ciclos de manejo con distinta duración temporal

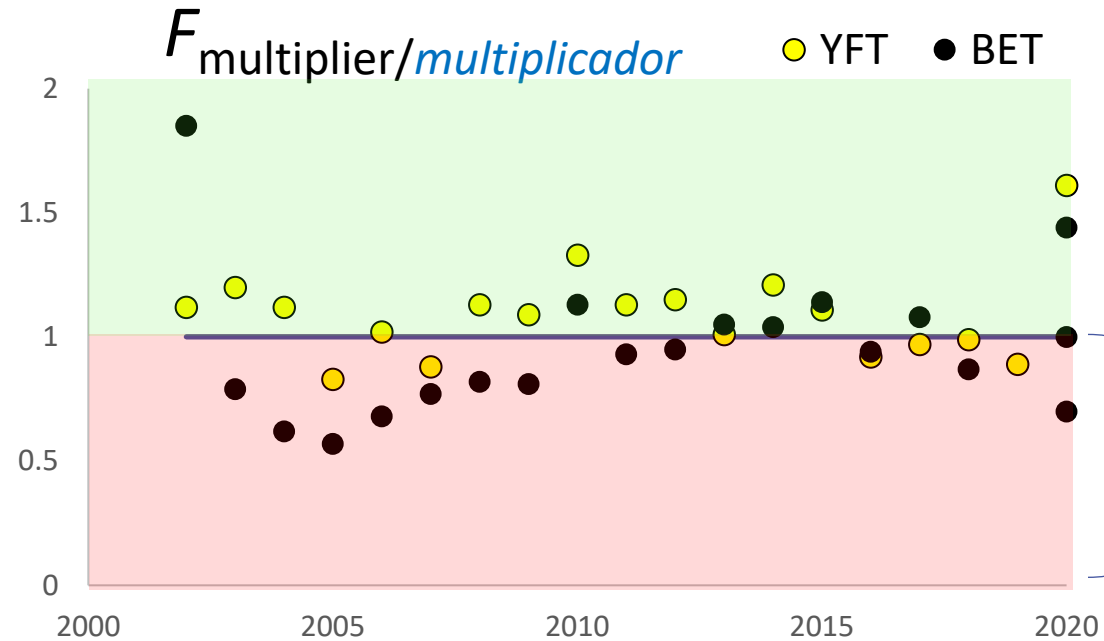
- **Reference Points (in progress) / *Puntos de Referencia (en progreso)***
 - Dynamic targets *Fishing mortality (F) and Biomass (B)*
Objetivos dinámicos para mortalidad por pesca (F) y biomasa (B)
 - Equilibrium limits for *F* and *B* (risk not to exceed 10%, alternative limits and risk to evaluate)
Límites en equilibrio para F y B (no exceder 10% riesgo, límites alternativos y riesgo a evaluar)
 - Combination of reference points for status and control points for triggering actions
Combinación de puntos de referencia para estado y puntos de control para gatillar acciones
- **Harvest Control Rules (in progress)/ *Reglas de Control (en progreso)***
 - Further specification of elements and implementation of current rule (C-16-02)
Especificación adicional de elementos e implementación de la regla actual (C-16-02)
 - Alternative rules (data-based, model-based), gradual changes instead of current step HCR
Reglas alternativas (basadas en datos, basadas en modelos), graduales vs. regla abrupta actual
 - Emergency rules
Reglas de emergencia

- COVID-19 pandemic / *Pandemia de COVID-16*
Limitations of virtual workshops, changes to workplan timeline
Pandemia de COVID-19, inhabilidad de tener talleres en persona
- Limited-representation by some CPCs, high turnover of representatives
Representación limitada de algunas CPCs, alto recambio de representantes
- Multiple extraordinary meetings during 2020-2021
Múltiples reuniones extraordinarias durante 2020-2021
- Some challenges expected to ameliorate/*Algunos desafíos se espera que mejoren*
COVID pandemic, workplan extended to 2024, conservation measures for 2022 to 2024
Pandemia de COVID, plan de trabajo hasta 2024, medidas de conservación de 2022 a 2024
- Funding for tropical tuna MSE work after 2023 has not been secured yet
Financiación para EEO de atunes tropicales luego de 2023 no esta asegurada
Work is conducted by contractor with EU funds through the end of 2023
El trabajo es realizado por un contratista con financiación de EU hasta el fin de 2023

Species focus (BET), rationale

Especie de foco inicial (BET), fundamentos

Initial MSE technical focus on BET, moving to other species towards the end of current work plan
Trabajo técnico de EEO inicial en BET, incluyendo otras especies a final de plan de trabajo actual



Historically, BET requires the strictest management
Históricamente, BET requiere el manejo mas estricto

- Recent work to improve BET modeling and operating models for MSE
Trabajo reciente para mejorar modelado de BET y modelos operativos para EEO
- Lack of assessment models (or operating models) for SKJ (although recent interim assessment in 2022)
Falta de modelos de evaluación (y modelos operativos) para SKJ (aunque evaluación interina en 2022)
- Need YFT (and SKJ) modeling work to incorporate hypotheses for assessment and operating models
Necesidad de trabajo adicional en modelos de YFT (y SKJ) para evaluación y modelos operativos
- As SKJ and YFT models are developed, they can be included in the MSE work
A medida que modelos de YFT y SKJ son desarrollados, pueden ser incluidos en el trabajo de EEO

Beyond BET MSE

- Multispecies (BET, YFT, SKJ), multi-gear (PS, LL) and fishing modes (FAD, Dolphin, NOA) present several challenges:
 - More difficult to simulate and evaluate
 - Different objectives for different fisheries?
 - Weak stock management? Or each (3 species) individually? or two species?
- Very few truly multispecies MSEs in the world, oftentimes they focus on gear interactions
- Need to discuss and plan as part of the next 5-year scientific strategic plan

IATTC Staff Activities and Research Plan (REVISED)

Actividades y Plan de Trabajo del Personal de la CIAT (REVISADO)

MSE tropical tunas – *EEO atunes tropicales*

[DOCUMENT SAC-13-INF-C link](#)

GREEN: COMPLETED; **BLUE:** FUNDED; **RED:** UNFUNDED, Text ~~struck through~~ indicates completed or terminated projects

SSP ref.	Target/Project	2018		2019		2020		2021		2022		2023		2024	
		1	2	1	2	1	2	1	2	1	2	1	2	1	2
	1. SUSTAINABLE FISHERIES														
	Goal I: Test harvest strategies using Management Strategy Evaluation (MSE)														
I.1.	Conduct a comprehensive MSE for bigeye tuna and plan MSEs for the other tropical tuna species														
I.1.a	1. Stakeholder and technical MSE workshops														
	a. Technical meetings to agree on overall/revised MSE Plan by IATTC staff and collaborators														
	b. Stakeholder workshops on training and communication on MSE development and results														
	2. Technical development of MSE, HCR, MP, outputs														
	a. Improve the bigeye assessment for use as spatial-OM														
	b. Run preliminary simulations with spatial-OM														
	a. Run preliminary MSE based on initial input from managers and stakeholders														
	b. Run final MSE based on revised input from managers and stakeholders														
	c. Present evaluated HCR/MP to Commission, plan work for other tropical tunas														

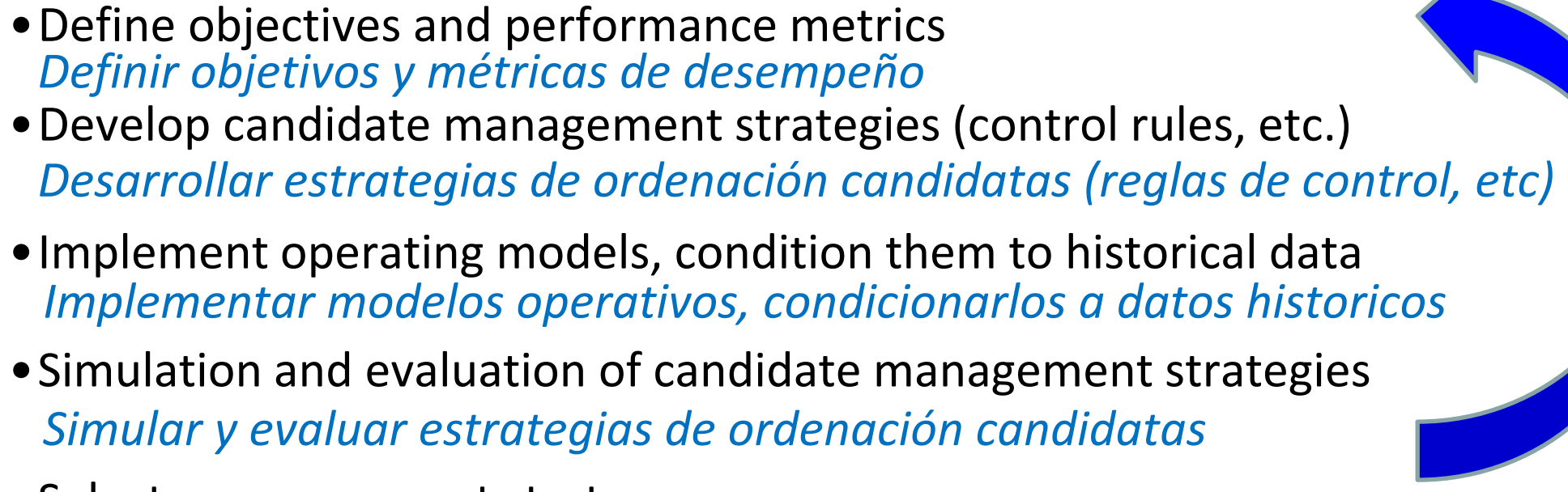
Transition of MSE work to other tropical species (YFT, SKJ) after 2024 to be outlined in the new IATTC Strategic Science Plan (planned in 2023)

Transición a EEO de otros atunes tropicales (YFT, SKJ) en 2024 detallado en el nuevo Plan Estratégico Científico de la CIAT (planeado en 2013)

Funds?
¿Fondos?

Steps in Management Strategy Evaluation

Pasos en Evaluación de Estrategias de Ordenación

- 
- Define objectives and performance metrics
Definir objetivos y métricas de desempeño
 - Develop candidate management strategies (control rules, etc.)
Desarrollar estrategias de ordenación candidatas (reglas de control, etc)
 - Implement operating models, condition them to historical data
Implementar modelos operativos, condicionarlos a datos históricos
 - Simulation and evaluation of candidate management strategies
Simular y evaluar estrategias de ordenación candidatas
 - Select a management strategy
Seleccionar una estrategia de ordenación
 - Consider implementing the evaluated management strategy
Considerar implementar la estrategia de ordenación evaluada

PROCESS NOT LINEAR!!! / *Proceso no lineal!!!*

ITERATIVE!!! / *Iterativo!!!*



Questions? *¿Preguntas?*