Joint MEDAC and SWWAC meeting- 19 July 2021
Workshop on Eastern Bluefin tuna Harvest Strategy

Atlantic bluefin tuna
Management Strategy Evaluation
Next steps:

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Management Strategy Evaluation (MSE)

MSE is a feedback process between managers and scientists (in concert with stakeholders) to define the most suitable management system.

- Managers define management goals for a fishery and potential ways for regulation (catch limits, maximum changes of catch, conditions…)
- Scientists will evaluate the different paths (Management Procedures) to achieve goals.

BFT- Thunnus thynnus

Operating Models (OMs): Mathematical representation of the system to be managed; including the biological components (fish stock population dynamics) and the fishery which operates on the stock (catches, size distributions, indices of abundances CPUE / surveys)

OMs reference grid is based on uncertainty factors: recruitment, spawning fraction / natural mortality rate M, area-specific spawning stock biomass (scale), weighting of length composition data.

[1]
[2]

How is a harvest strategy for Bluefin tuna selected?

Management Procedure (MP) or Harvest Strategy (HS)

MP : "A fisheries management procedure is a formal definition of what, and when, management actions are to be made in response to changes in a fishery. It is a collection of specifications, formula and rules which maps the pathway from fisheries data to fisheries management actions." (Bentley and Stokes, 2011)

- MPs are evaluated against OM
- Select best MP, choice based on agreed objectives and trade-offs.
- Choice based on long term, not calculation on next year's catch

Performance statistics (from OMs)

To evaluate performance of candidate MPs on the set of OMs agreed to represent uncertainty (how well an MP could achieve management objectives)

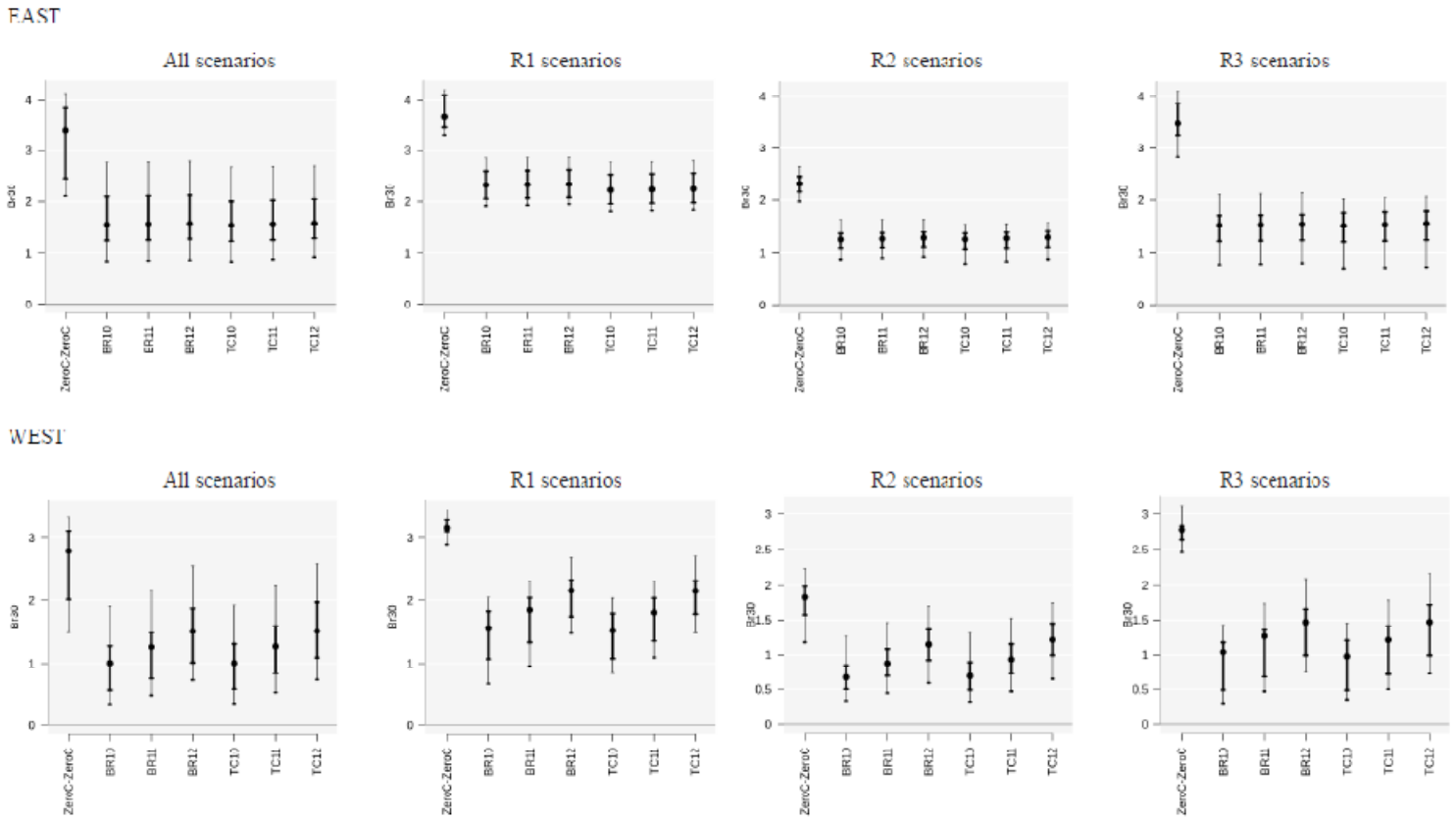
Generally include measures of stock status, safety, catch and variability.

Help deciding among candidate MPs

	Description
AAVC	Average annual variation in catches (AAV) among CMP updates
AvC10 (new)	Mean catches over first 10 projected years. Required to provide short-term vs long-term (AvC30) yield trade-offs
AvC30	Mean catches over first 30 projected years
AvgBr (new)	Average Br (spawning biomass relative to dynamic SSB_{MSY}) over projection years 11-30
Br30	Depletion (spawning biomass relative to dynamic SSB_{MSY}) after projection year 30
PGT (new)	'Probability Good Trend', 1 minus probability of negative trend (Br31 – Br35) and Br30 is less than 1. Probability of 1 is biologically better. In cases where all simulations are above Br30, PGT = 1 regardless of trend. This allows further discrimination between CMPs that have comparable fraction of simulations below Br30.

How is a harvest strategy for Bluefin tuna selected?

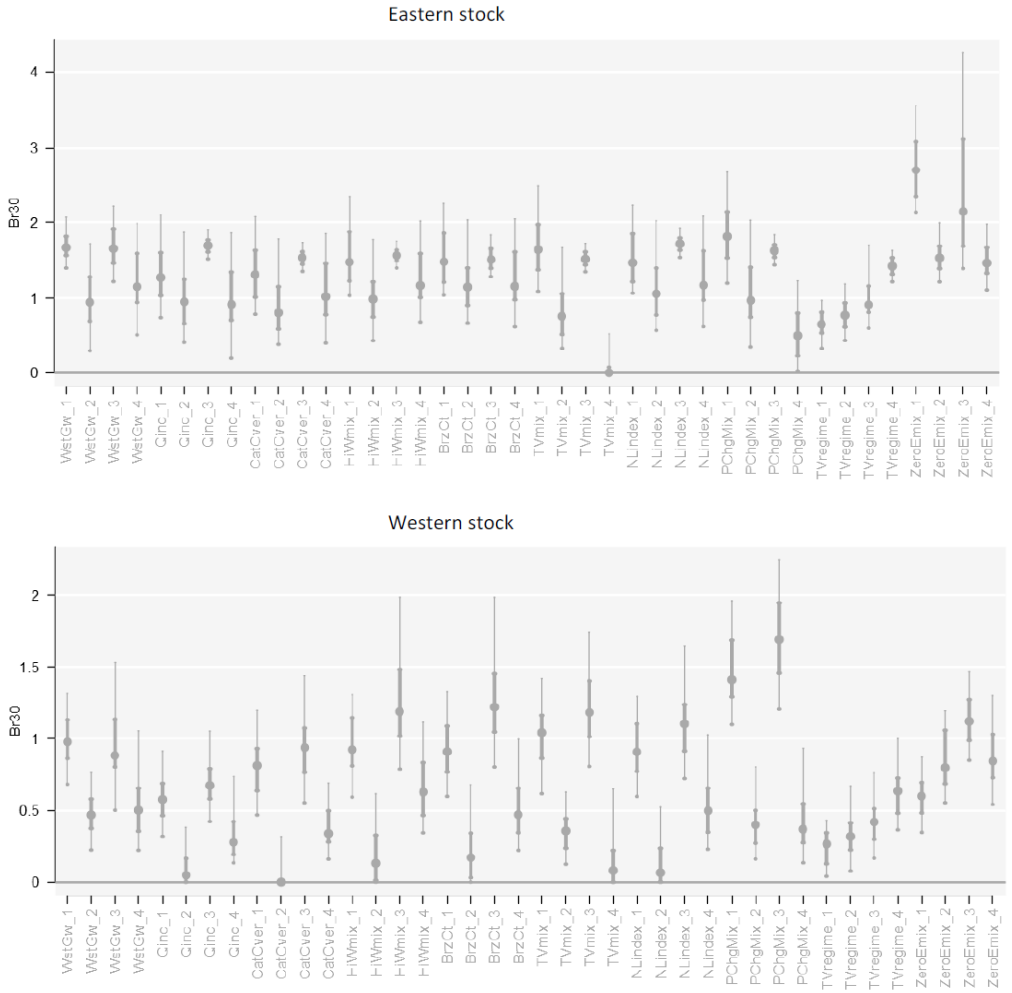
- **Primarily based on best performances for the reference set (grid) of OMs**



How is a harvest strategy for Bluefin tuna selected?

- Primarily based on best performances for the reference set (grid) of OMs, **and if required the choice is then made on the basis of best performance over the robustness trials**.

The Robustness trials:
Growth curve,
Catchability Increases,
Unreported overages,
Time varying mixing .....



How is a harvest strategy for Bluefin tuna selected?

- Based on CMP results using AvC30, AAVC, and fifth percentile Br30 which capture three of the highest priority performance measures regarding **yield, variability in yield and safety**.
- Projected time series of future catch and biomass.
- Trade-off plots (AvC30 versus Br30). The primary trade-off between catch and stock status.

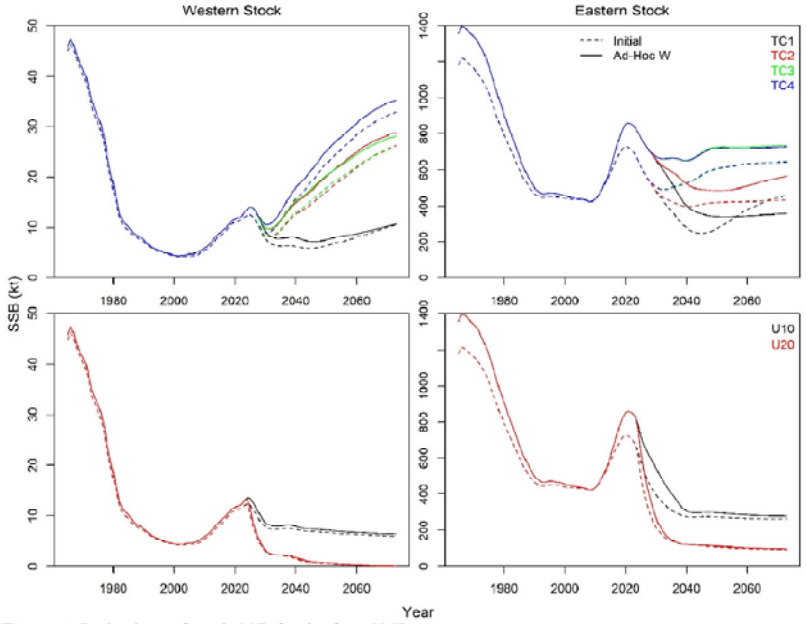
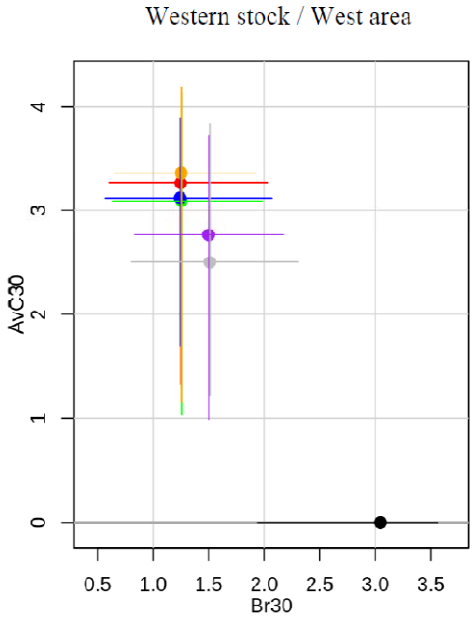
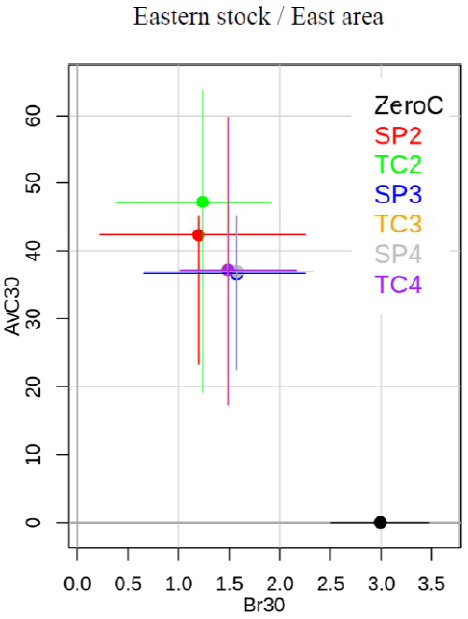


Figure 4. Projections of stock SSB for the four CMPs.

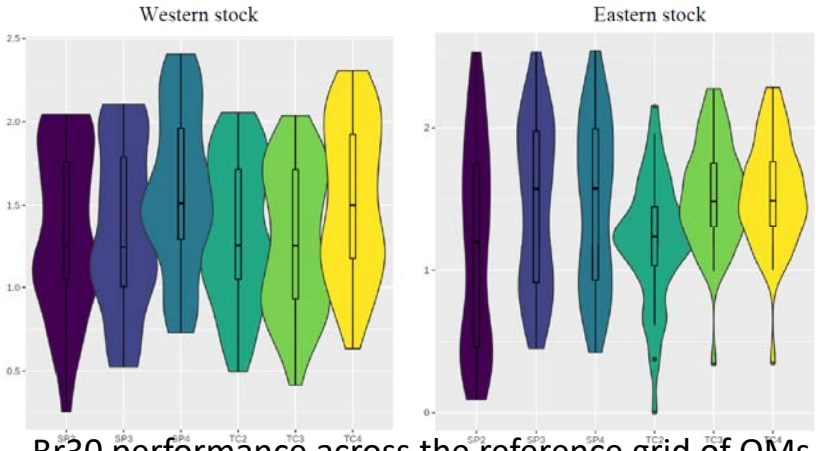




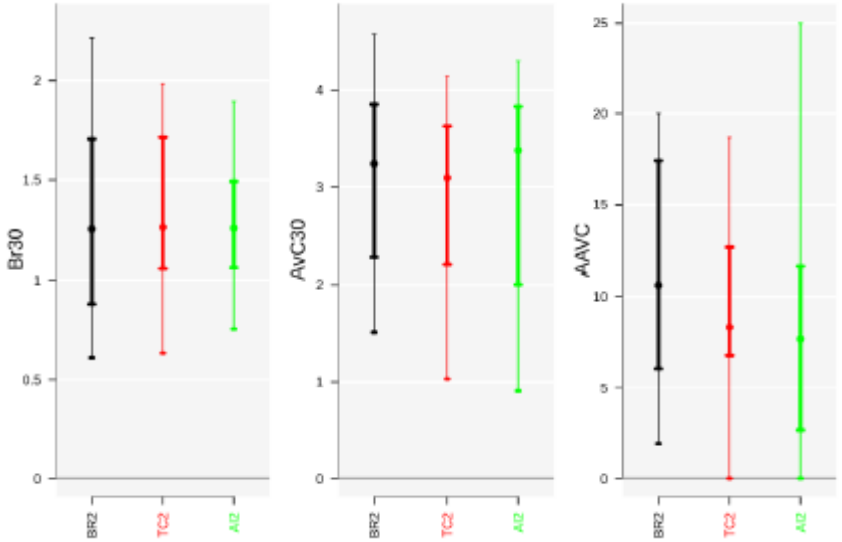
How is a harvest strategy for Bluefin tuna selected?

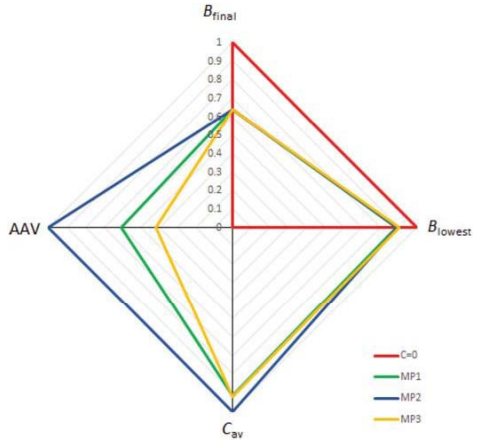
- Trade-offs in yield, biomass and variability in yield among CMPs.
- Violin plots
- Spider plots

Figures would be reported in tabular form as well.

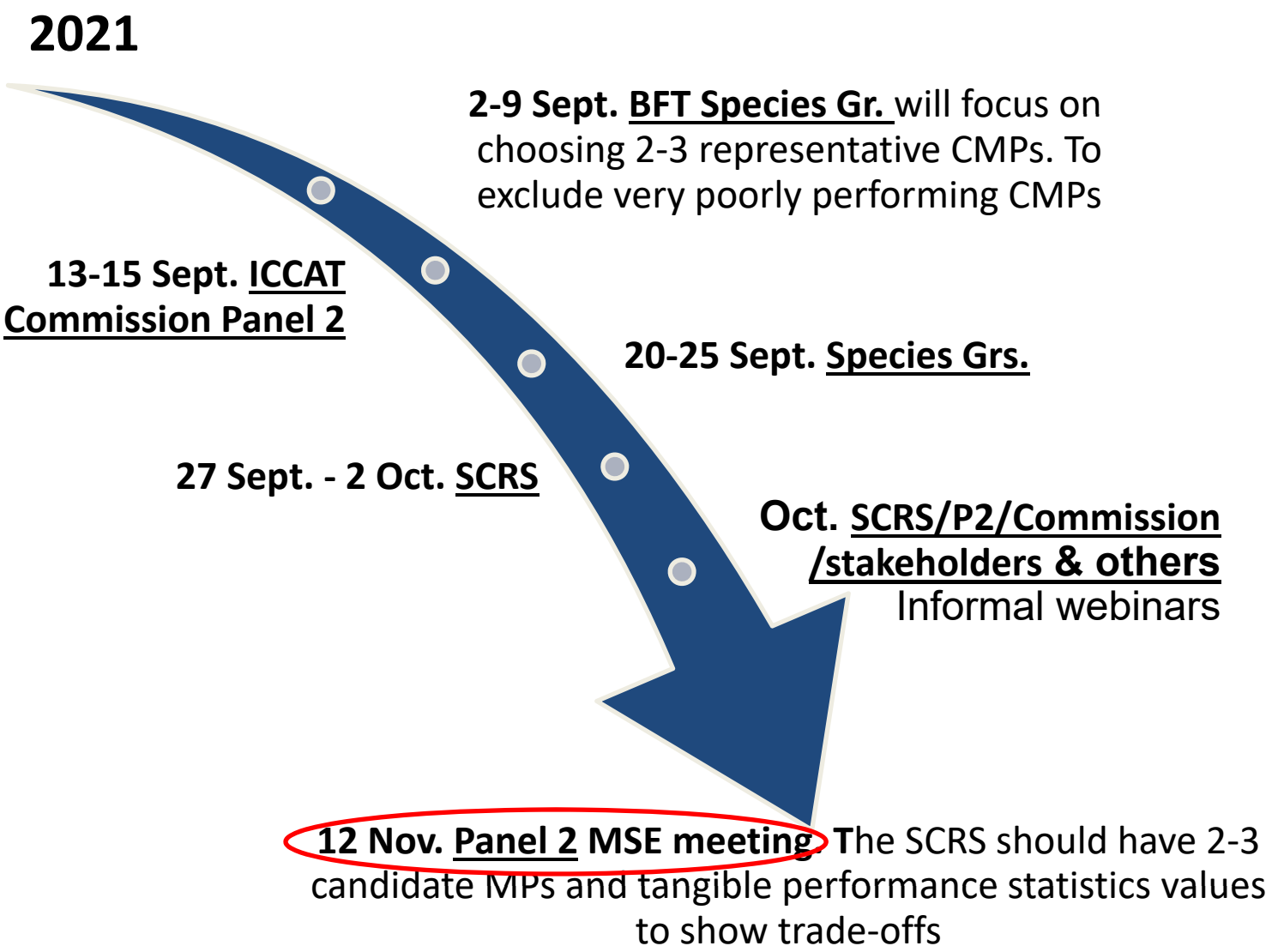


Br30 performance across the reference grid of OMs





ICCAT Commission & SCRS workplan toward 2022 adoption



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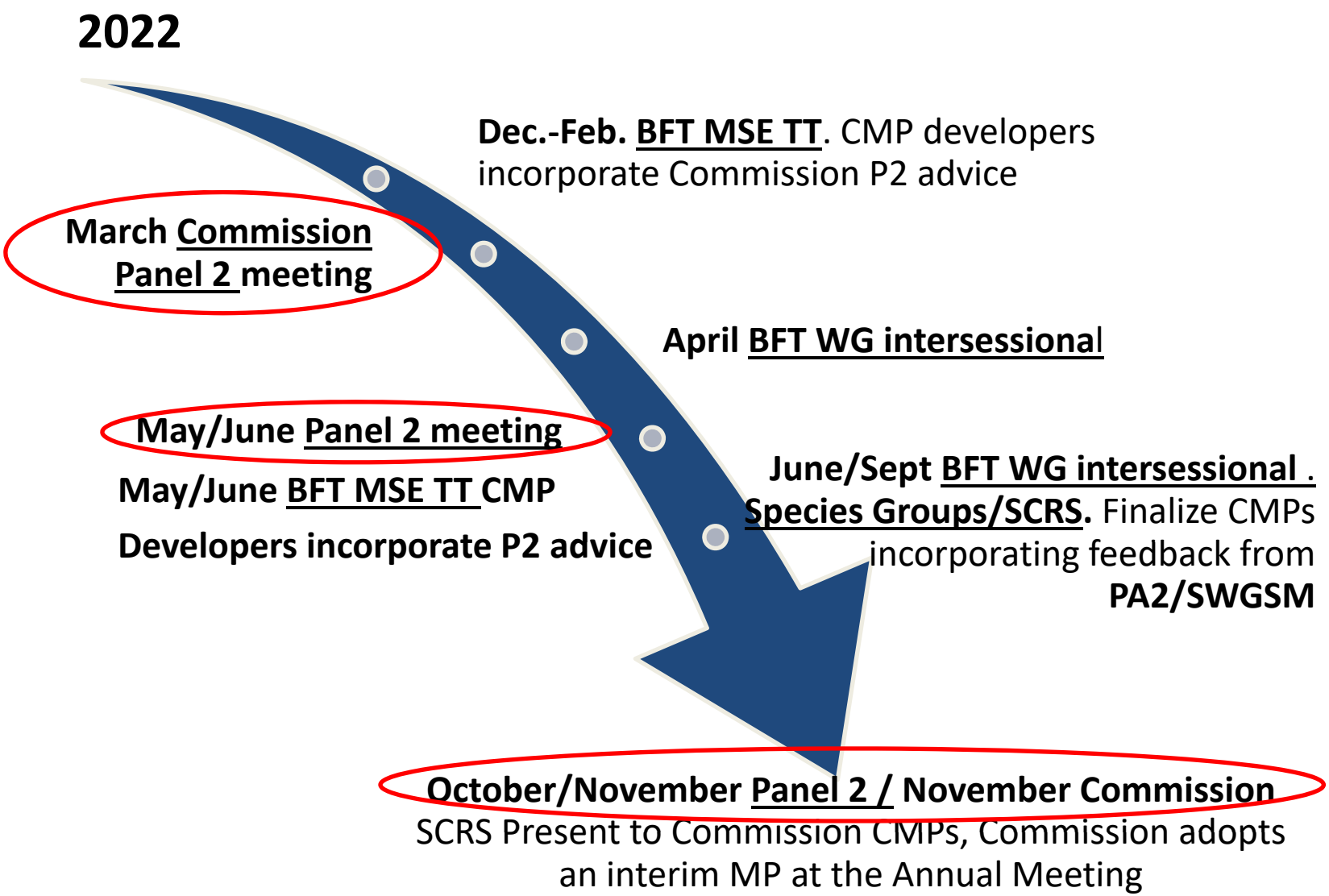

Opportunities for stakeholder engagement

MSE requires inputs from both scientists and managers, in concert with stakeholders.

- Informal webinars
- National meetings with scientist, managers & stakeholders
- Regional Advisory Councils (MEDAC, SWWAC for EU members)
- SWGSM The standing working group to enhance dialogue between fisheries scientists and managers (ICCAT)
- ICCAT Commission Panel 2 (Temperate tunas, North)

What the future looks like with a harvest strategy in place

Harvest strategies move managers away from **yearly**, and at times contentious, quota negotiations to a set of pre-agreed rules geared towards fostering **long-term** sustainability and profitability of fisheries.

Harvest strategies have proved to be more effective than traditional management methods, replacing short-term, profits-focused decision-making with swift, efficient, and stable oversight that is designed to balance tradeoffs among management objectives for both the species and socioeconomic dimensions of the fishery. This scientific approach also better accounts for the variable and uncertain environments in which fisheries operate.

ICCAT is expected to adopt a fully specified harvest strategy for both Atlantic bluefin tuna stocks in 2022.

Thank you

❖ Current Management objectives:

19-04 **BFT**

RECOMMENDATION BY ICCAT AMENDING THE RECOMMENDATION 18-02 ESTABLISHING A MULTI-ANNUAL MANAGEMENT PLAN FOR BLUEFIN TUNA IN THE EASTERN ATLANTIC AND THE MEDITERRANEAN

Objectives

1. The Contracting Parties and Cooperating non-Contracting Parties, Entities or Fishing Entities hereinafter referred to as CPCs, whose vessels have been actively fishing for bluefin tuna (*Thunnus thynnus*) in the eastern Atlantic and the Mediterranean shall implement a management plan for bluefin tuna in that geographic area starting in 2019 with the goal of maintaining the biomass around $B_{0.1}$, achieved by fishing at or less than $F_{0.1}$, which the SCRS considers to be reasonable proxy for F_{MSY}.

   This objective shall be revisited and modified, if necessary, once Management Strategy Evaluation has made sufficient progress, when alternative management objectives can be considered, and Reference Points, Harvest Control Rules and/or Management procedures can be adopted.

❖ Current Management objectives:

18-03 **BFT**

RESOLUTION BY ICCAT ON DEVELOPMENT OF INITIAL MANAGEMENT OBJECTIVES FOR EASTERN AND WESTERN BLUEFIN TUNA

1. Management objectives should be established for Atlantic bluefin tuna. Operational objectives are to be based on the Convention's objective: to maintain populations at levels that will support maximum sustainable catch (usually referred to as MSY).

2. Panel 2 should undertake, preferably during a 2019 intersessional meeting of Panel 2, the development of initial operational management objectives for each stock of bluefin tuna. To facilitate this development, the following candidate management objectives should be considered:

   a) Stock Status

      a. The stock should have a greater than [__]% probability of occurring in the green quadrant of the Kobe matrix;

   b) Safety

      a. There should be a less than [__]% probability of the stock falling below B_{LIM} (to be defined);

   c) Yield

      a. Maximize overall catch levels; and