



**Updates on Stock Status of ICCAT
Large Pelagic species in the
Mediterranean Sea.**

*Working Group (WG2)
Pelagic fishes -ICCAT*

ICCAT Secretariat

(12 October 2023)

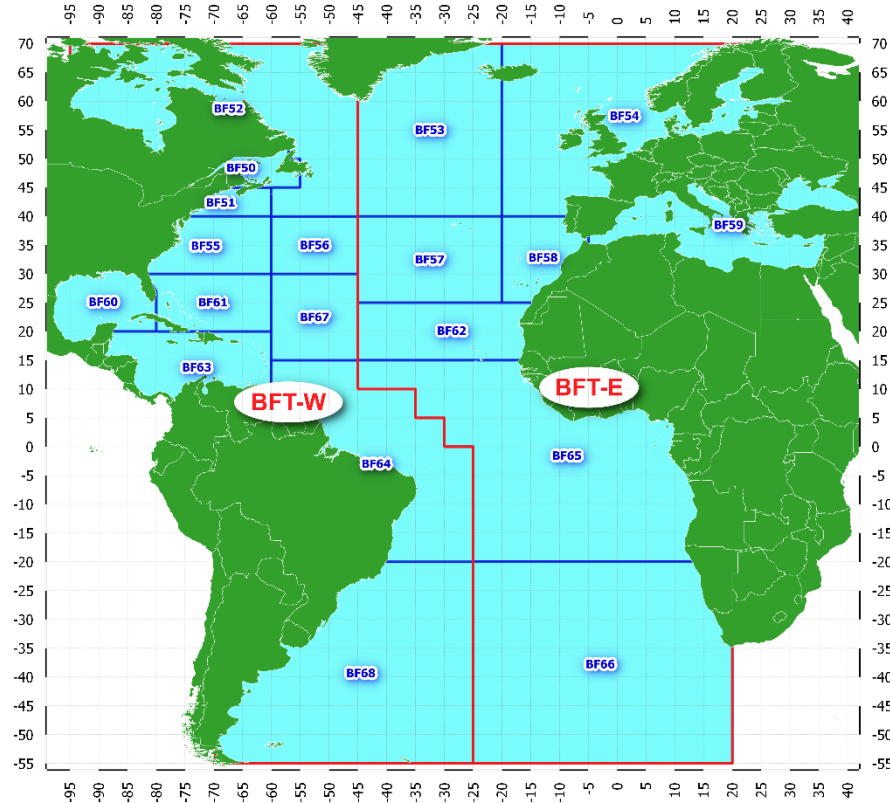
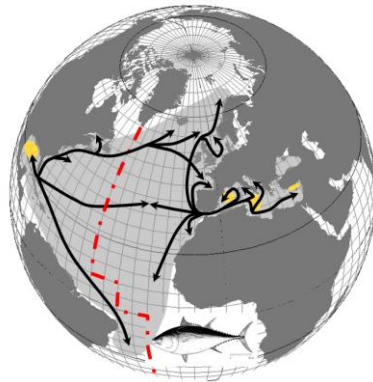
ICCAT CICTA CICAA



Bluefin tuna: Background information

Managed by International Commission for the Conservation of Atlantic Tunas (ICCAT):

- Stock Assessment in 2022 East Atlantic and Mediterranean BFT.
- BFT under a Management Plan since 2022.
- Management through input control measures (e.g. vessel list, minimum size/weight, fisheries closures, TAC, etc.)



Objective:

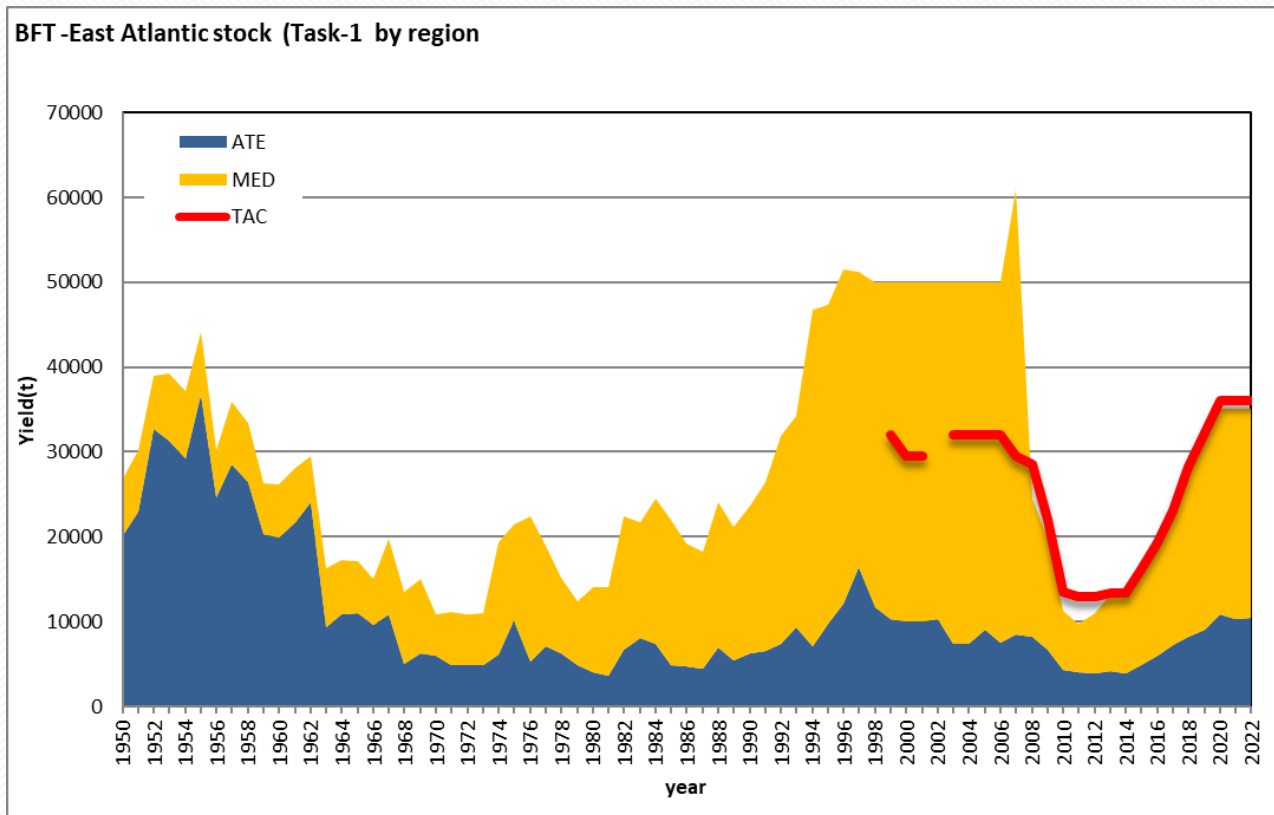
- Maintain the stocks at level which will permit maximum sustainable catch for food and other purposes



Fisheries

- Production:

- Maximum catch estimated at 62,638 t in 2007.
- Catch in 2022* **35,102 t** (TAC **36,000**), of which **24,625 t** (70%) in the Mediterranean Sea.

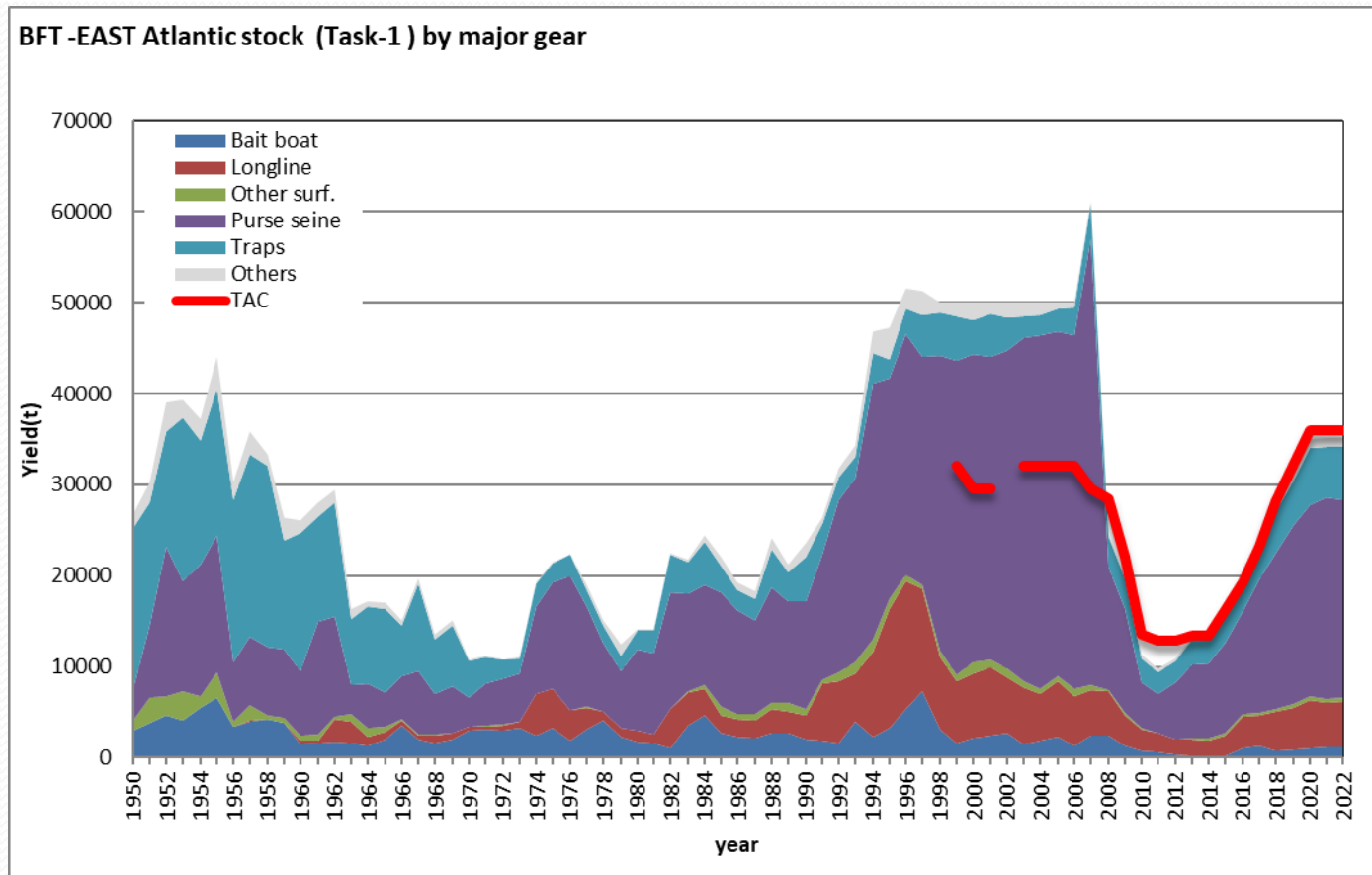


* Catch as of September 29, 2023.



Fisheries

- Main gears:
 - East-Atlantic -Traps, longlines and baitboats
 - Mediterranean – Purse-seine, traps, longlines and Sport fisheries





Bluefin MSE (Management Strategy Evaluation)

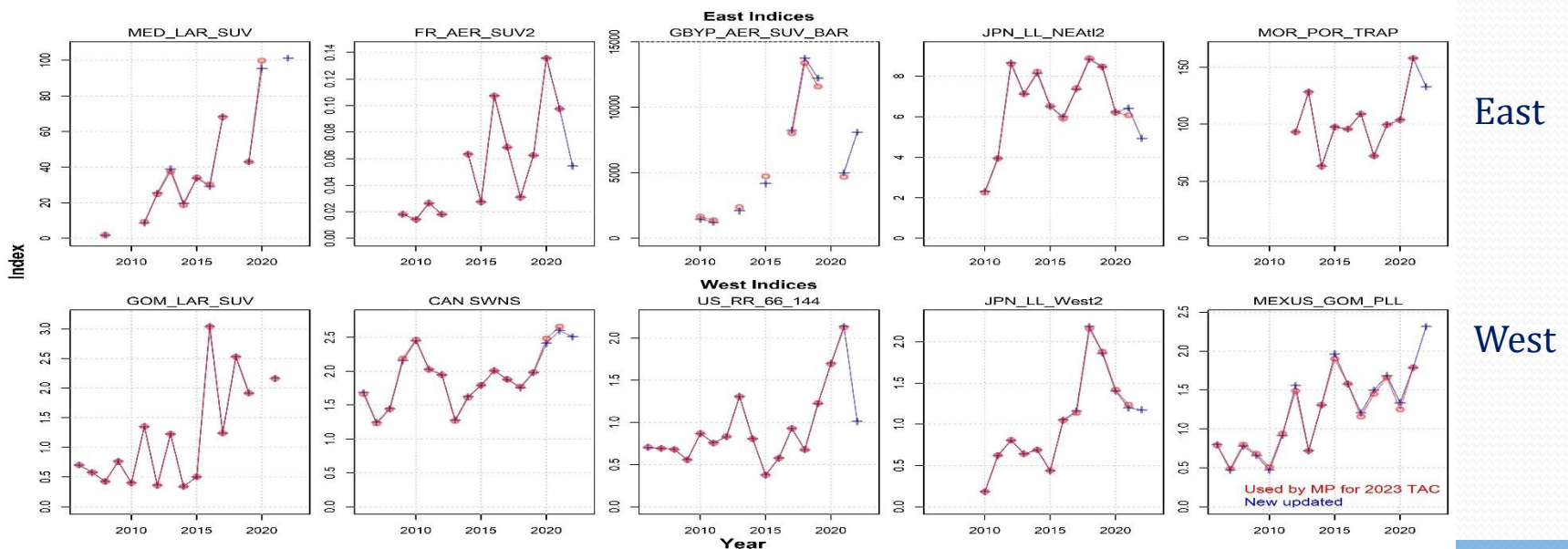
- **2022** (Rec. 2022-09)
 - **Management Objectives** were adopted
 - 1) **Status:** prob $\geq 60\%$ in green of Kobe Plot,
 - 2) **Safety:** prob $< 15\%$ below B_{Lim} (40% of SSB_{MSY}),
 - 3) **Yield:** Maximum overall catch levels,
 - 4) **Stability:** TAC change between periods within $+20\%/-35\%$
 - **Management Procedure (MP)** was agreed
 - Pre-agreed method to calculate TAC for the East and West BFT
 - MP uses 10 abundance indices from both stocks
 - TAC 2023-2025: **East & Med 40,570 t**, West 2,726 t
- **2023**
 - **Exceptional Circumstances**
 - *“The SCRS shall assess the occurrence of exceptional circumstances annually and provide scientific guidance on the exceptional circumstances protocol for the BFT MP (Rec. 22-09)”*



BFT MSE: 2023 Exceptional Circumstances

- **EC Criterion:** stock dynamics; evaluating any changes in abundance and life history or fishery dynamics.
- **SCRS 2023 conclusion:**
“As of this date, no new evidence that abundance, life history or fishery dynamics substantively different than those tested in the operating models has emerged. For 2022, no triggering of EC.”

Abundance indices used for the TAC and updated indices in 2023





East Atlantic and Mediterranean Bluefin tuna Exec Sum Table

Current reported yield (2022)	35,102 t*
$F_{\text{current}}/F_{0.1}^2$	0.81 (0.48-1.62)¹
Stock Status ³	Overfishing: NO
TAC 2023-2025, Rec. 22-08	40,570 t

1 Mean and approximate 95% confidence interval from integrating across the uncertainty for each model.

2 F_{CURRENT} refers to the geometric mean of the estimates (a proxy for recent F levels) for 2017-2020 for VPA, and for 2018-2020 for ASAP and Stock Synthesis. For the VPA and ASAP, F is measured as apical F, for stock synthesis F is exploitation rate in biomass.

3 Biomass reference points to determine stock status were not estimated since the 2017 assessment due to uncertainty in recruitment potential.

* As of September 29, 2023



SCRS 2022 East BFT Management Advice

- The management plan (**BFT MP**) established in Rec. 22-08 and based on the MP for BFT sets a TAC for BFT-E of 40,570 t for 2023 to 2025.
- According to the proposed exceptional circumstances (EC) provisions reviewed in 2023, no EC exists that would warrant deviating from the TAC advice under the **BFT MP**.



2022 SCRS Recommendations

East and Mediterranean Bluefin tuna

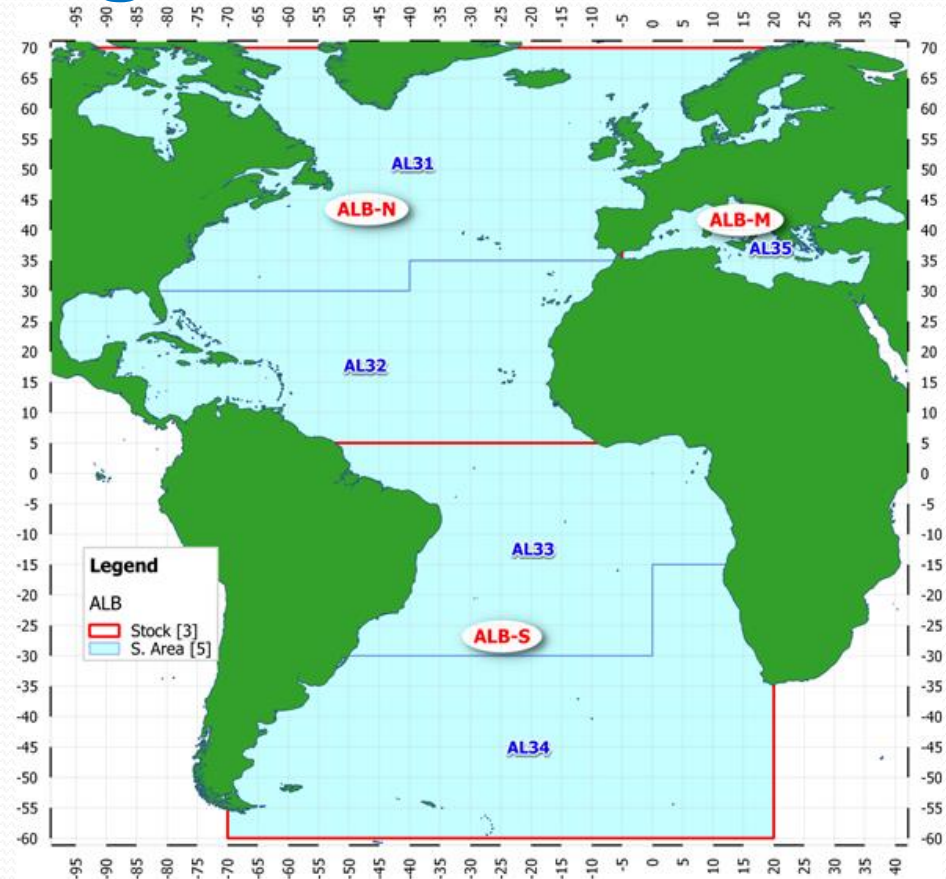
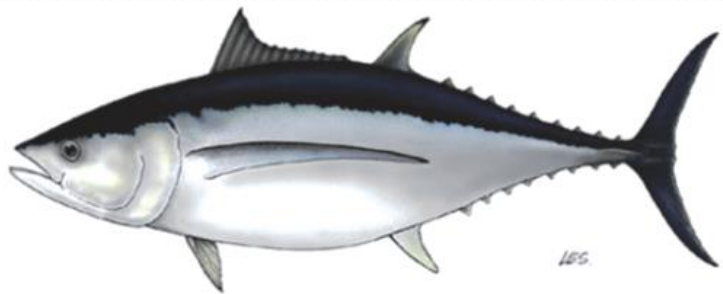
- The Committee recommends to fully explore the feasibility of applying CKMR methodology for bluefin tuna on both sides of the Atlantic. It recommends that as soon as technically and logistically feasible it be applied in the eastern Atlantic and Mediterranean Sea area.
- Sampling in the framework of the CKMR in the East Atlantic has sampling requirements that probably cannot be fully assumed by the GBYP considering the current availability of funds. Therefore, ways to ensure the availability of funds for the implementation of the CKMR approach to Atlantic BFT stocks should be explored.
- The Committee recommends the development of modelling that will allow further improvement of BFT management, specifically, further improvement of indices standardization to include spatiotemporal variation and the incorporation of new information in future rounds of MSE conditioning, as well as evaluation of the models to be used for future assessments.



MED Albacore tuna: Background information

Managed by International Commission for the Conservation of Atlantic Tunas (ICCAT):

- ALB Three stocks (N-ATL and MED mixing occurring but extent unknown)
- **MED-ALB Stock Assessment in June 2021** with data until **2019**.
- Management through input control measures (e.g. vessel list, temporal fisheries closures)



Objective:

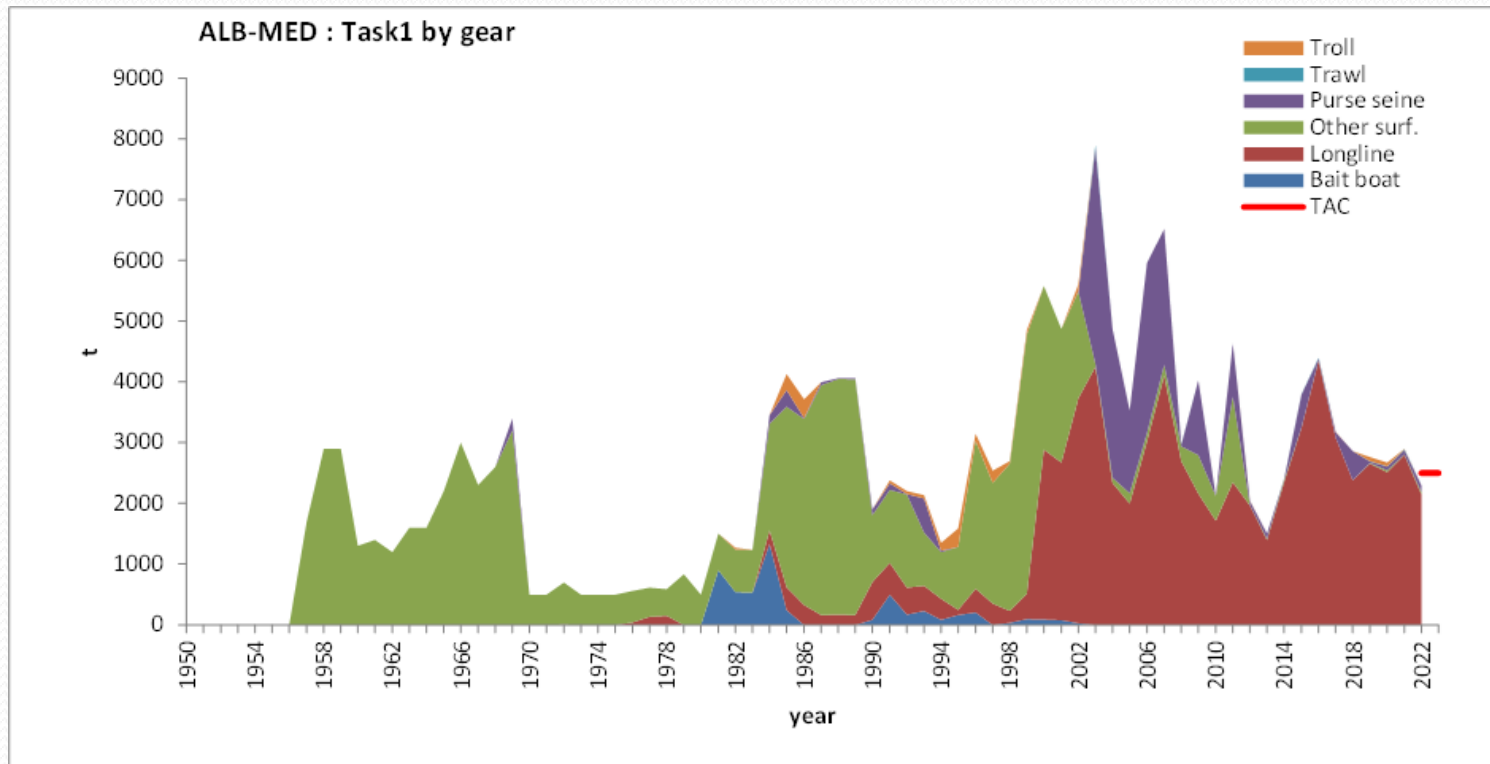
- Maintain the stocks at level which will permit maximum sustainable catch for food and other purposes



Fisheries

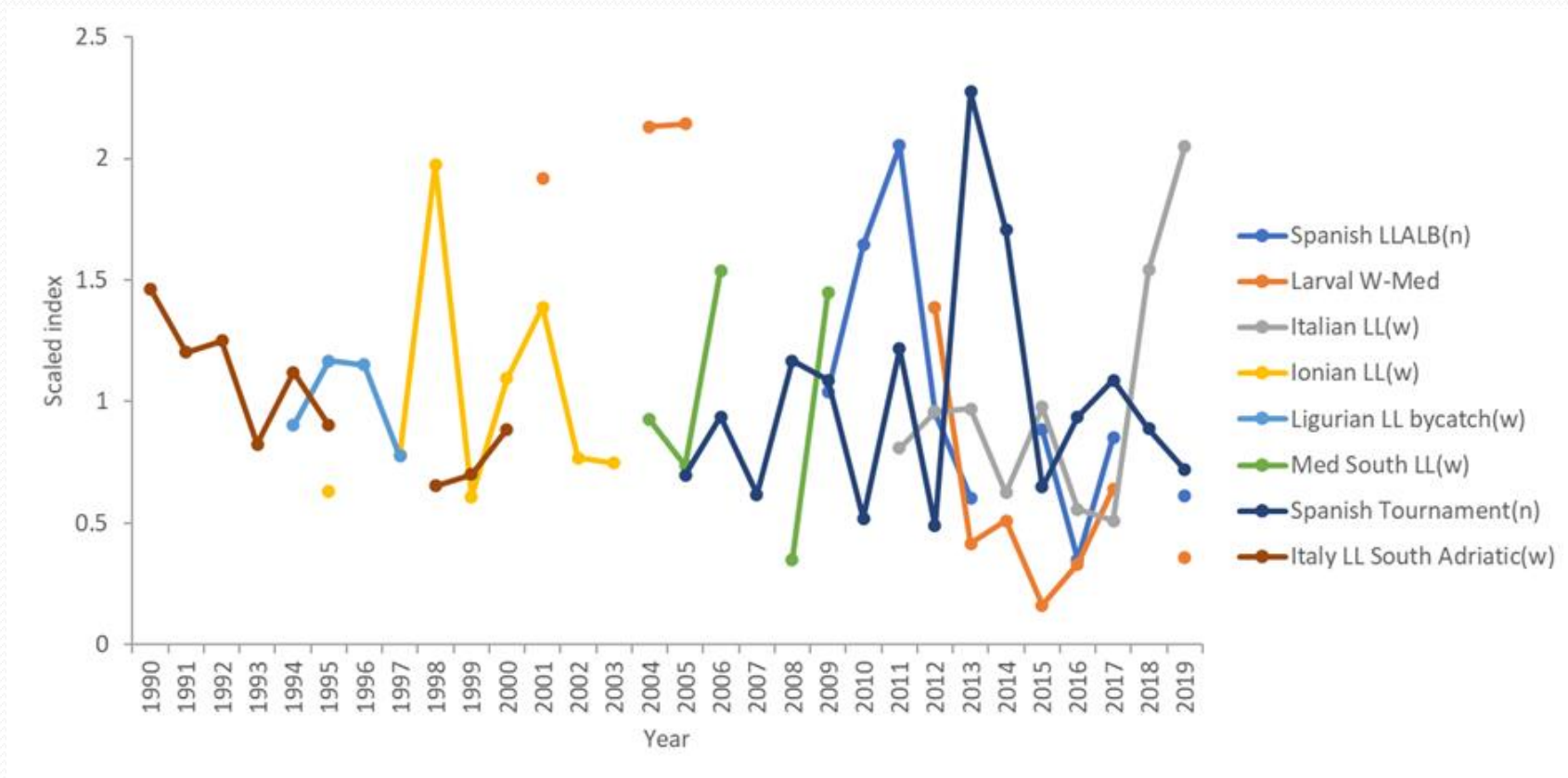
- Production in the Mediterranean:

- Catch peak of 7,898 t in 2003, average of 2,890 t period 2010-2022
- 2,762 t in 2019; 2,675 in 2020, 2,895 in 2021, and **2,295 t** in **2022**.
- Uncertainty of non-reported catches in the Mediterranean (IUU).





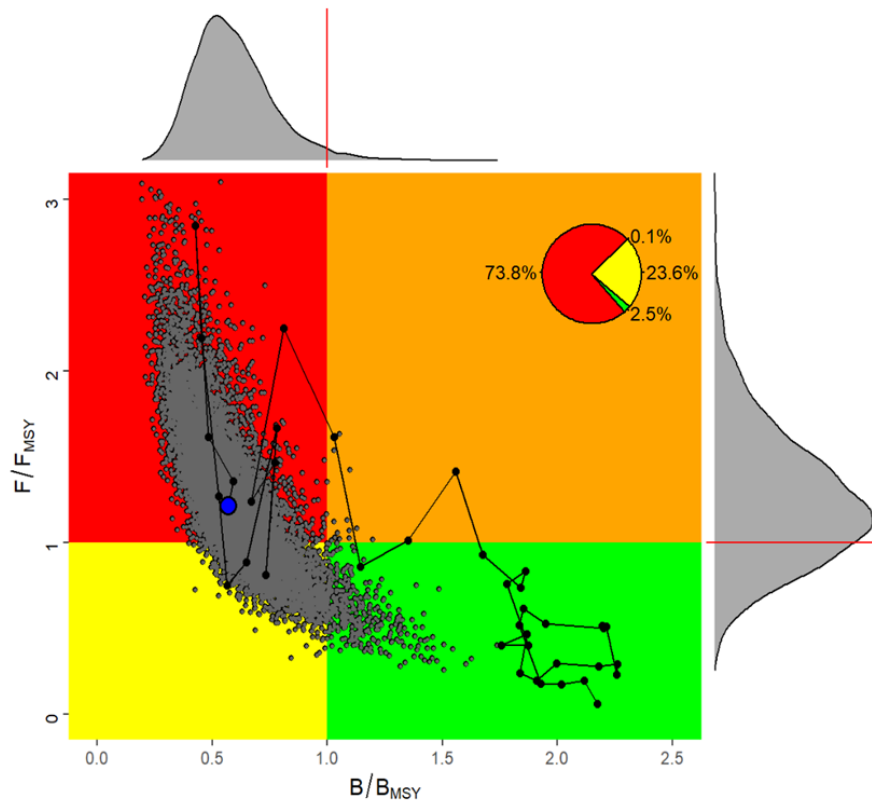
Indices of Abundance



Mediterranean albacore. Abundance indices used in the *2021 Assessment of the Mediterranean albacore stock* (Anon., in press). *n* and *w* refer to abundance indices in number and weight, respectively.



M-ALB Kobe plot – Stock status



Uncertainty:

- Under-reporting catches (IUU)
- Restrictive spatial-temporal coverage of CPUEs
- Lack of historical CPUE series
- Conflicting trend of CPUEs e.g., LL Italy vs W-Med larval index.

Probability of being overfished 97.4% $B < B_{MSY}$
 Probability of overfishing occurring 74% $F > F_{MSY}$

Stock status trajectories of B/B_{MSY} and F/F_{MSY} , as well as uncertainty around the current estimate (Kobe plots) for the Bayesian surplus production JABBA model.



Mediterranean Albacore Exec Sum 2021

MEDITERRANEAN ALBACORE SUMMARY	
Maximum Sustainable Yield	3,653.9 t (2,446-5,090 t) ¹
2021 and 2022 Yields	2,901 and 2,295 t
Yield in last year of assessment (2019)	2,484 t
B_{MSY}	19,703.1 t (11,676 - 36,833 t) ¹
F_{MSY}	0.184 (0.091 - 0.335) ¹
B_{2019}/B_{MSY}	0.570 (0.322 - 1.004) ¹
F_{2019}/F_{MSY}	1.213 (0.618 - 2.175 t) ¹
Stock Status	Overfished: YES
	Overfishing: YES
Management measures in effect:	Rec. 21-06: Establish a 15-yr Rebuilding Plan Med ALB TAC 2,500 t Limit number of authorized vessels for M-ALB. Census Sport & Recreations vessels (Max 3 vessel/day). Closure period (Jan-Mar or Oct-Nov + Feb 15-Mar).

¹ Median and 95% credibility intervals from the Bayesian surplus production model.



Management Advice MED-ALB

- Uncertainty in data inputs contribute to uncertainties in the characterization of stock status, especially for fishing mortality (Wide Cis on F/F_{MSY}).
- Based on the best available data and models, projections of last year assessment (2019) stock status show that catches exceeding 4,000 t would lead to a high probability of driving the stock to extremely low levels, risking stock collapse.
- By comparison, catches on the order of **2,500 t**, close to the average of the years 2017 to 2019 would allow the stock to recover to the green quadrant of the Kobe plot with a greater than **60%** probability by 2032.
- This level of fishing also has a **13%** probability of reducing B/B_{MSY} below 0.2 by 2032.



SCRS Recommendations

Mediterranean Albacore

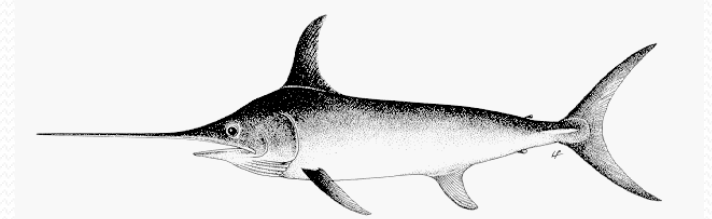
- The Committee recommends an increase in effort to complete the Task 1 NC for Mediterranean albacore, this being one of the main uncertainties not quantified in the assessment. CPCs and the Secretariat should work together to complete the Task 1 data before the next assessment, and to consider alternative methods to estimate unreported catches.
- Due to the current limitations of the Mediterranean albacore stock assessment, the Committee recommends continuing the development of a comprehensive and coherent research plan for this stock to be integrated within the Atlantic wide ALB-Research Program.



MED Swordfish: Background information

Managed by ICCAT

- Single stock unit with limited mixing with **N-ATL stock**
- Last Assessment **June 2020**
- Management through input control measures (e.g. TAC, vessel list, min. size/weight, fisheries closures)



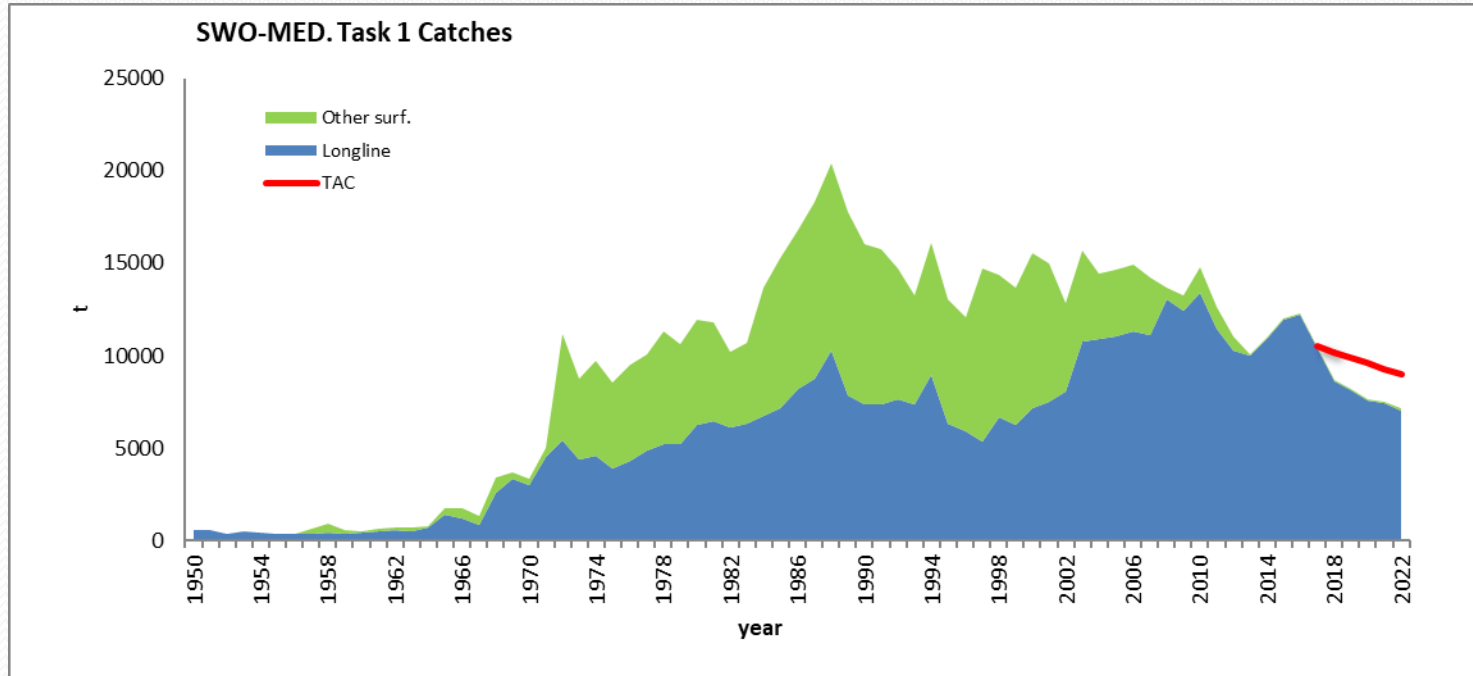
Objective:

- Maintain the stocks at level which will permit maximum sustainable catch for food and other purposes

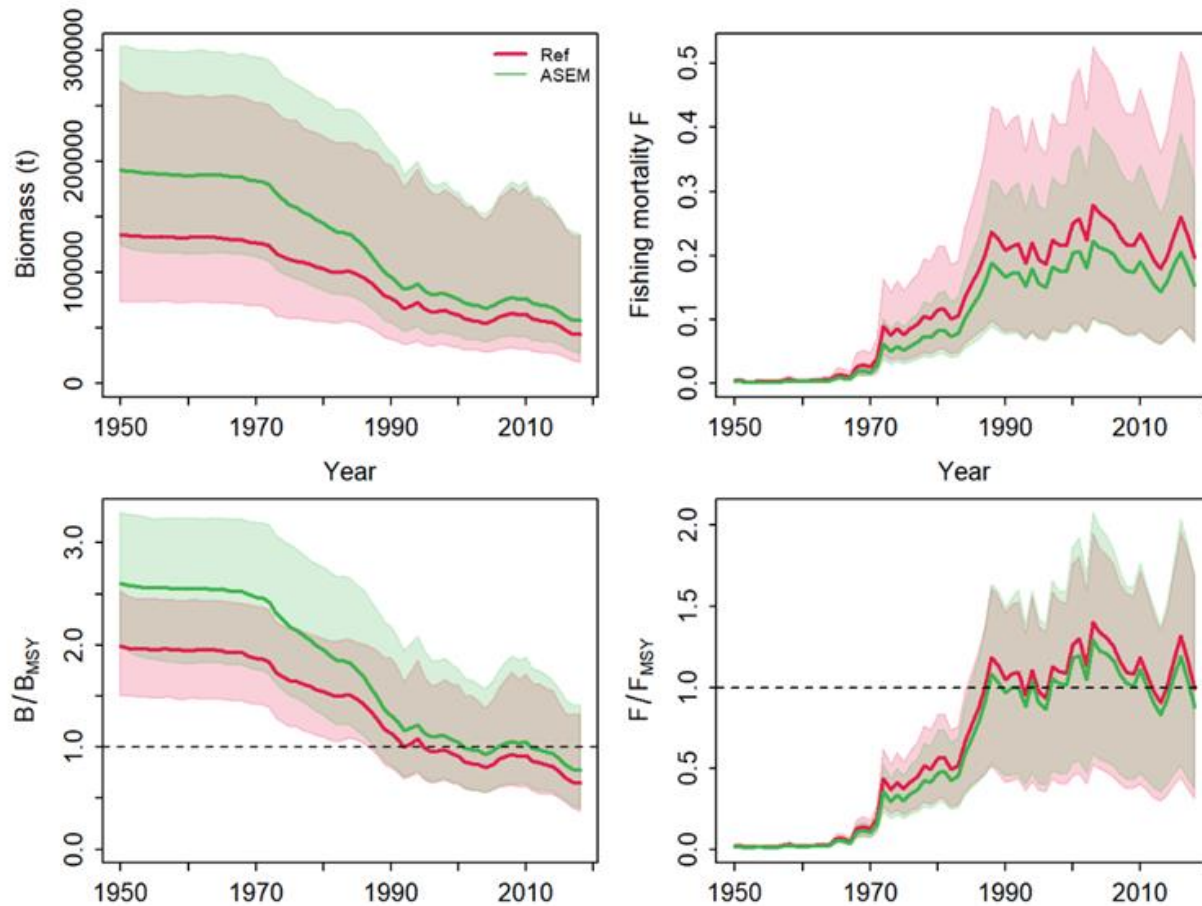


Fisheries

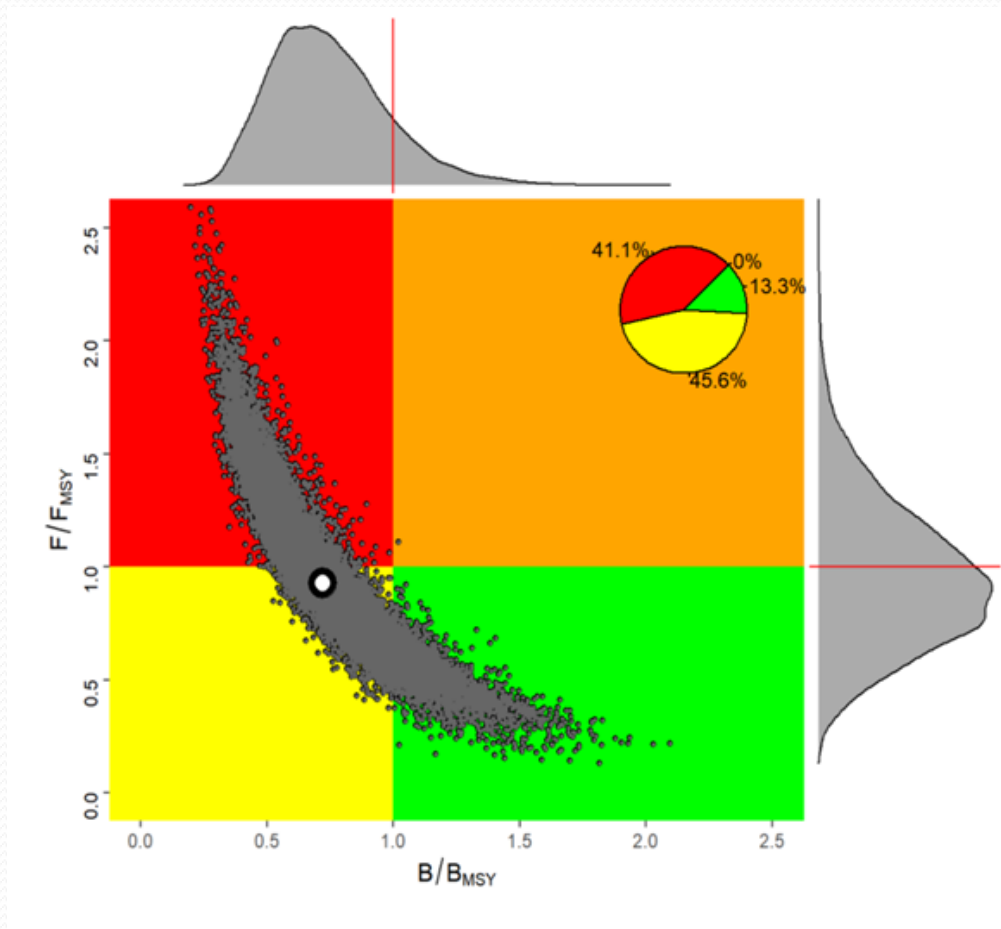
- Main gears: Longlines (surface, mesopelagic) and Gillnets (prohibited since 2012)
- Production declining in the recent years from 12,300 (2016) to 7,169 (2022).
- Catch in 2022 **7,169 t** a 12% decrease compared to average catch 2018-2020 and below the **2022 TAC** of **9,017 t**.



Estimates of Task 1 swordfish catches (t) in the Mediterranean by major gear types, for the period 1950-2022. Non-reporting may happen in the earlier period (up to the middle 1980s).



SWO-MED-Figure 3. Trends in biomass and fishing mortality (upper panels) and biomass relative to B_{MSY} (B/B_{MSY}) and fishing mortality relative to F_{MSY} (F/F_{MSY}) (bottom panels) for each scenario from the Bayesian state-space surplus production model fits to Mediterranean swordfish.



SWO-MED-Figure 4. Kobe phase plot showing the combined posteriors of B_{2018}/B_{MSY} and F_{2018}/F_{MSY} presented in the form of joint MCMC posteriors of JABBA model runs for Mediterranean swordfish. The probability of posterior points falling within each quadrant is indicated in the pie chart.



Mediterranean Swordfish Summary 2020

Maximum Sustainable Yield	13,325 (10,899 – 17,346 t) ¹
2021 and 2022 Yields	7,493 – 7,169 t
B _{MSY}	71,319 (42,562 – 113,758) t ¹
F _{MSY}	0.19 (0.12 – 0.34) ¹
Relative Spawning Biomass B ₂₀₁₈ /B _{MSY}	0.72 (0.38 – 1.29) ¹
Relative Fishing Mortality F ₂₀₁₈ /F _{MSY}	0.93 (0.42 – 1.68) ¹
Stock Status (2018)	Overfished: Yes ¹ Overfishing: No
Management Measures in Effect:	Driftnet ban [Rec. 03-04] Three-month fishery closure, gear specifications (number and size of hooks and length of gear), minimum catching size regulations, list of authorized vessels, fishing capacity restrictions, domestic observers onboard on longlines. TAC [Rec. 16-05]: 10,500 t in 2017, 10,185 t in 2018, 9,879 in 2019, 9,583 in 2020, 9,296 in 2021 and 9,017 in 2022 .

¹ 95% credibility intervals of 30,000 MCMC iterations from Bayesian surplus production models.



SWO-Med Management recommendations

- **Stock biomass 2018 was about 30% lower** than that corresponding to MSY, while **2018 fishing mortality was around F_{MSY}** .
- Analysis indicated that **the probability of stock rebuilding** by the end of the **projection period (2028) is at least 60%** if a **TAC equal to or less than 10,000 t** is implemented.
- There are **uncertainties on stock productivity**, therefore these estimates may be optimistic and should be interpreted with caution.



Mediterranean Swordfish Recovery Plan Rec. 16-05

Rec. [16-05] Multi annual **Recovery plan 2017 – 2031**

TAC in 2017 of 10,500 t.

- Reduction of **TAC 2018-2022** by **3% each year**
- **Fishing capacity reduction and limitation**
 - Limit to the average number of vessels 2013-2016
- Fishing countries to submit **Fishing Plans** to ICCAT yearly.
- **Closed fishing season(s)** Jan 1st – Mar 31st / Oct 1st – Nov 30th
- **Gear restrictions** hook size/ length LL 100 cm LJFL/11.4 kg.
- Sport – recreational fisheries restrictions.



SCRS Recommendations MED-Swordfish

The next assessment should be completed in **2025** but, in order to monitor stock trends, essential fisheries indicators (e.g., catch, indices of abundance), should be reviewed in **2024**.

Given the above needs and considering the questions raised during the latest assessment the workplan will include:

- Review relevant fisheries and biological data.
- Update estimates of standardized CPUE indexes for the most important fisheries.
- Obtain estimates of discard misreporting.
- Estimates of undersized catch.

Additionally, the Committee encourages national scientists to identify the effects of the environment on swordfish biology, ecology and fisheries.

Future CPUE analyses should evaluate the effects of important climate and oceanographic changes that have occurred recently in the Mediterranean Sea (e.g., eastern Mediterranean transient) and how may impact the availability of the stock to some fisheries, and/or the recruitment of the population.



Please visit also the ICCAT 2023 meeting webpage

(2023 SCRS Advice to the Commission)*

<https://www.iccat.int/en/Meetings.html>

Thanks for your attention