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

Working Group (WG2) on pelagic fishes - ICCAT

ICCAT Secretariat

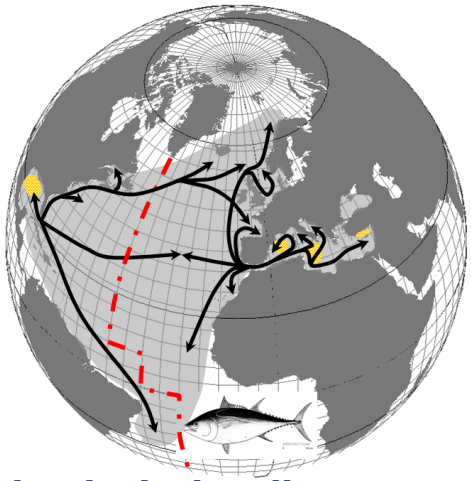
(17 October 2022)

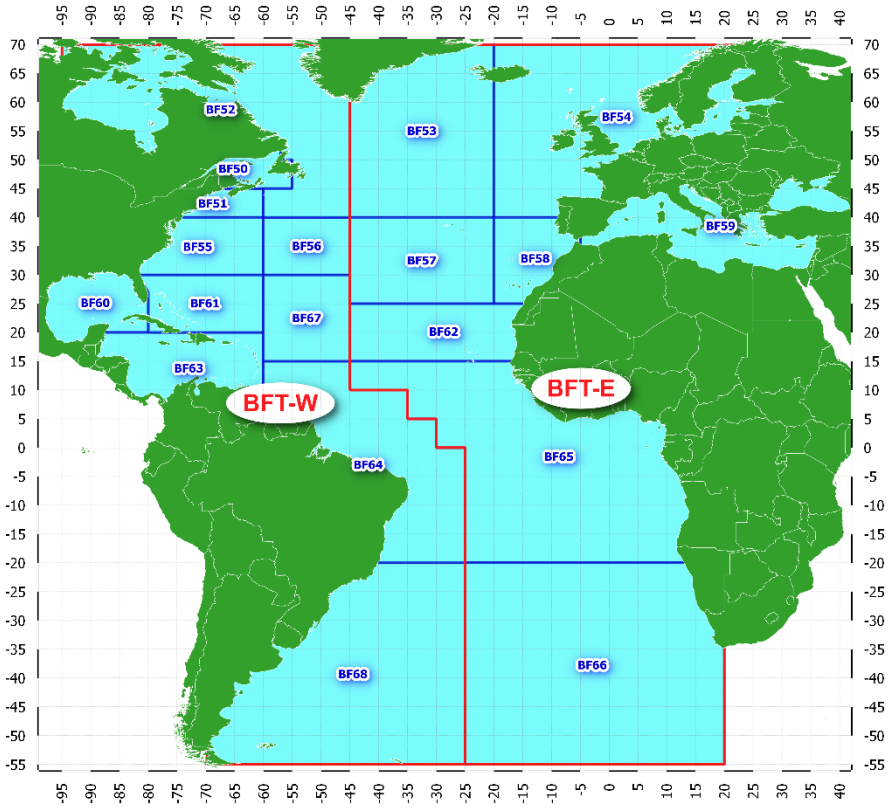
ICCAT CICTA CICAA

Bluefin tuna: Background information

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

- Two stocks East and West (mixing occurring, but extent not know)
- **Stock Assessment in 2022 East Atlantic and Mediterranean BFT.**
- Management through input control measures (e.g. vessel list, minimum size/weight, fisheries closures, TAC, etc.)



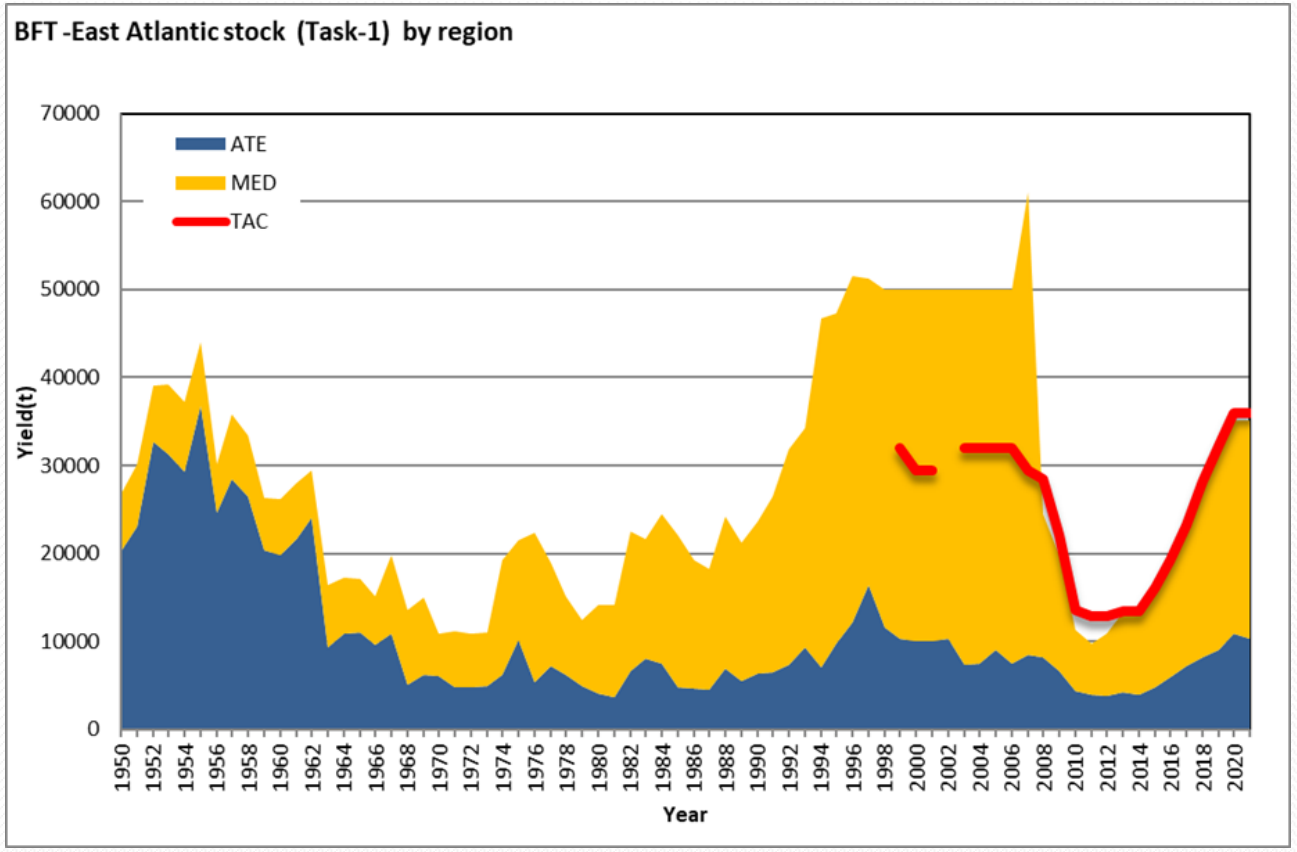


Objective:

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

Fisheries

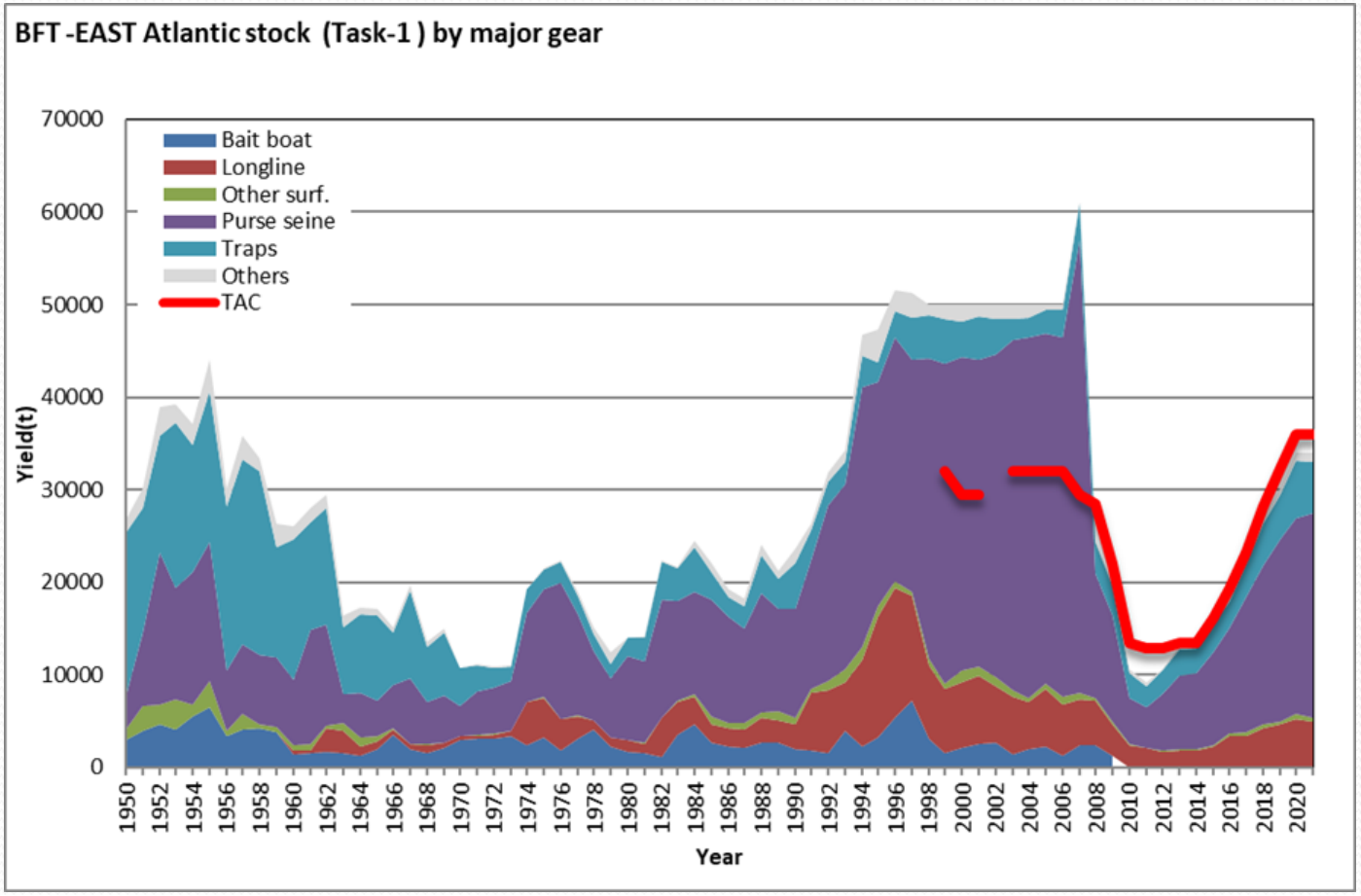
- Production:
  - Maximum catch estimated at 62,638 t in 2007.
  - Catch in 2022* **35,075** t (TAC **36,000**), of which **24,279** t (69%) in the Mediterranean Sea.



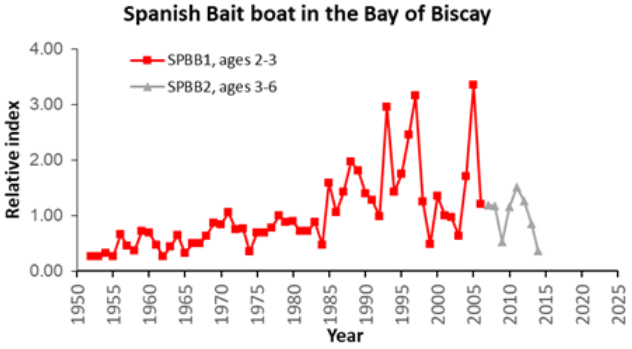
* Catch as of September 24, 2022.

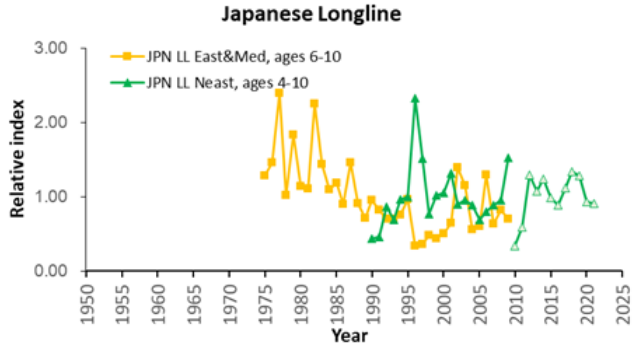
Fisheries

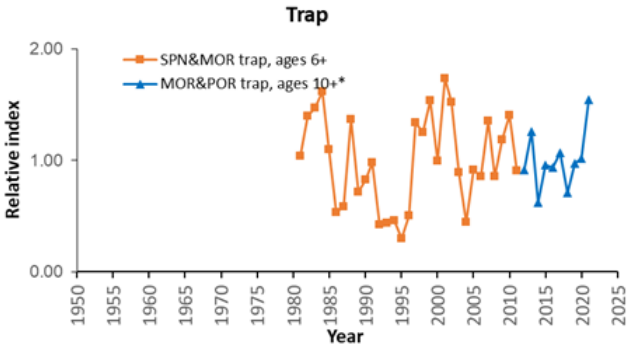
- Main gears:
  - East-Atlantic -Traps, longlines and baitboats
  - Mediterranean – Purse-seine, traps, longlines and Sport fisheries

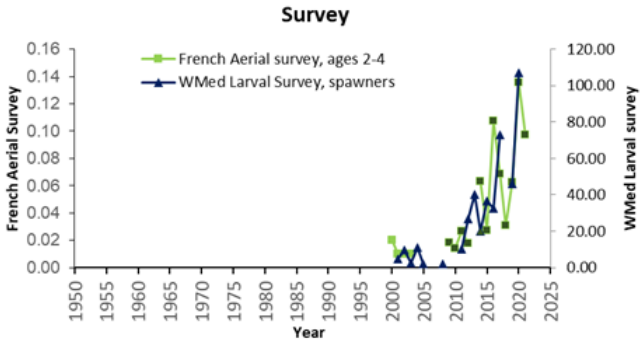


Updated Indices of Abundance E-BFT

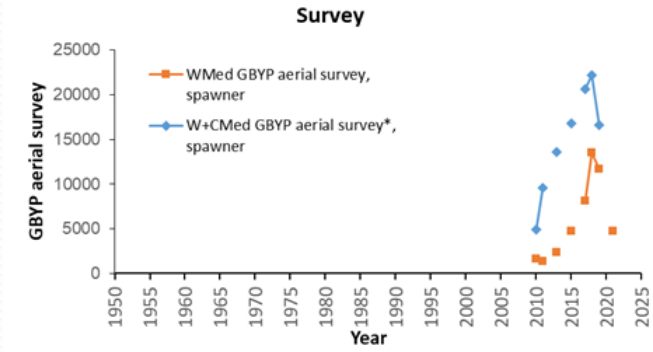




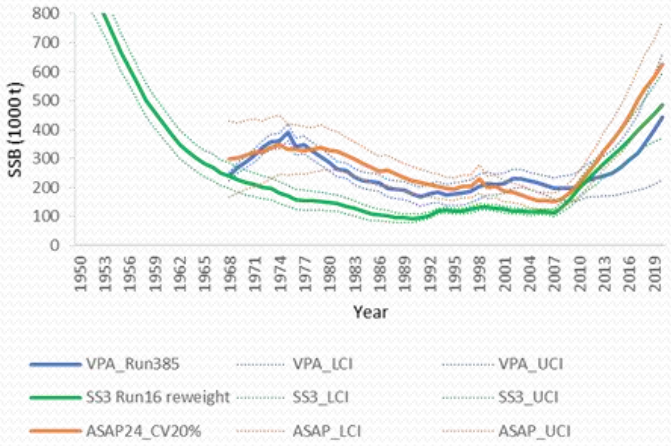


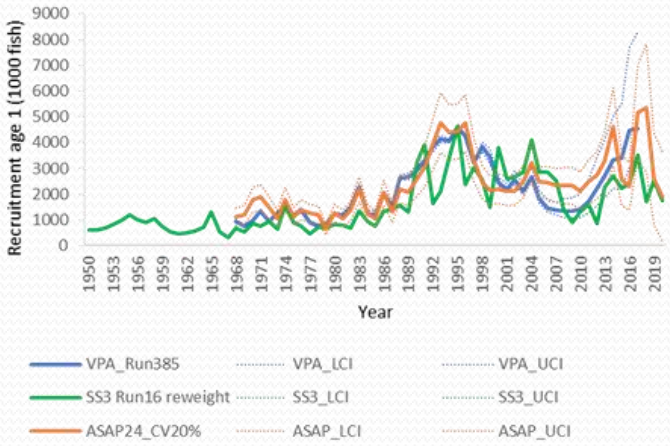


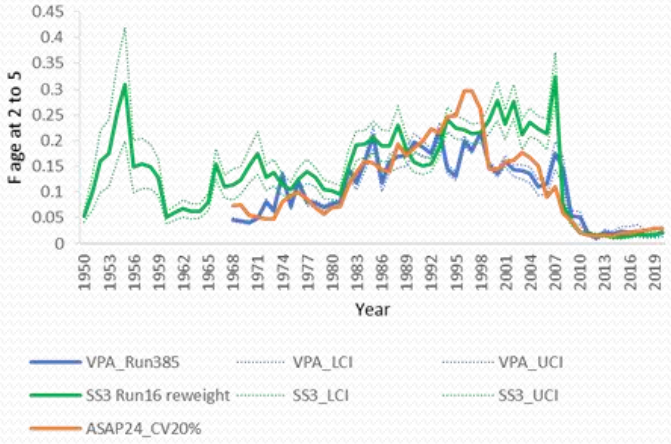
The Spanish BB series was split in two series to account for changes in selectivity patterns. The Japanese Longlines CPUE for the Northeast Atlantic (split in 2009/2010), the Morocco-Portugal Trap combined CPUE, the French aerial survey index (split in 2008/2009), and the GBYP aerial survey for the western Mediterranean (W-Med) updated until 2021. The larval survey in the western Mediterranean was updated until 2020.

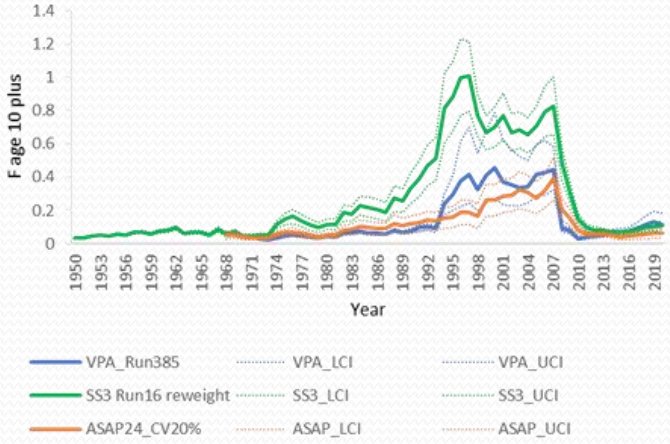


Historic trends of Abundance and Fishing mortality from the E-BFT stock assessment models









East Atlantic and Mediterranean Bluefin tuna Exec Sum Table

Current reported yield (2021)	**35,075 t***
$F_{current}/F_{0.1}$ [2]	0.81 (0.48-1.62)[1]
Stock Status [3]	Overfishing: **NO**
TAC 2022, Rec. 21-08	36,000 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 2022

SCRS 2022 East BFT Management Advice

- The Committee **recommends that the Commission adopt one of the MSE-tested management procedures** (see item 22.14, Response to the Commission's request), **and that the TAC be set based on that MP for 2023 and beyond.**

- **Should the Commission not adopt a management procedure in 2022**, the Committee **sees no undue risk to the stock for a rollover of the present TAC for 2023 (36,000 t).** The Committee bases this on a review of the stock indicators and from the trends in the VPA projections that indicate increases in the stock under the current management.

SCRS 2022 East BFT Other items

- The Committee is aware of **ongoing, unquantified, IUU catches** that represents a serious impediment to being able to determine the productivity of the stock and to provide reliable TAC advice. In response, the Committee urges **identification** and **quantification** of **IUU catches** so that it can provide more accurate biomass-based catch advice and obtain more accurate scientific understanding of stock productivity.
- The SCRS has **updated the estimates of expected average and maximum growth of E-BFT in farming Operations**. Based on the results from individual tagging studies in farms, it was confirmed **higher growth rates** of farmed E-BFT **both in size and weight compared to wild fish**.
- The Commission has requested **update on the Fishing Capacity of E-BFT fleets**. Preliminary analysis were presented based on individual vessels catch rates (CPUE) considering JFO and other management regulations. Results are expected to be presented in 2023.
- The Commission has requested **review of the protocols and algorithms for Stereo-camera systems** and **estimates of total weight from video recordings**.

2022 SCRS Recommendations

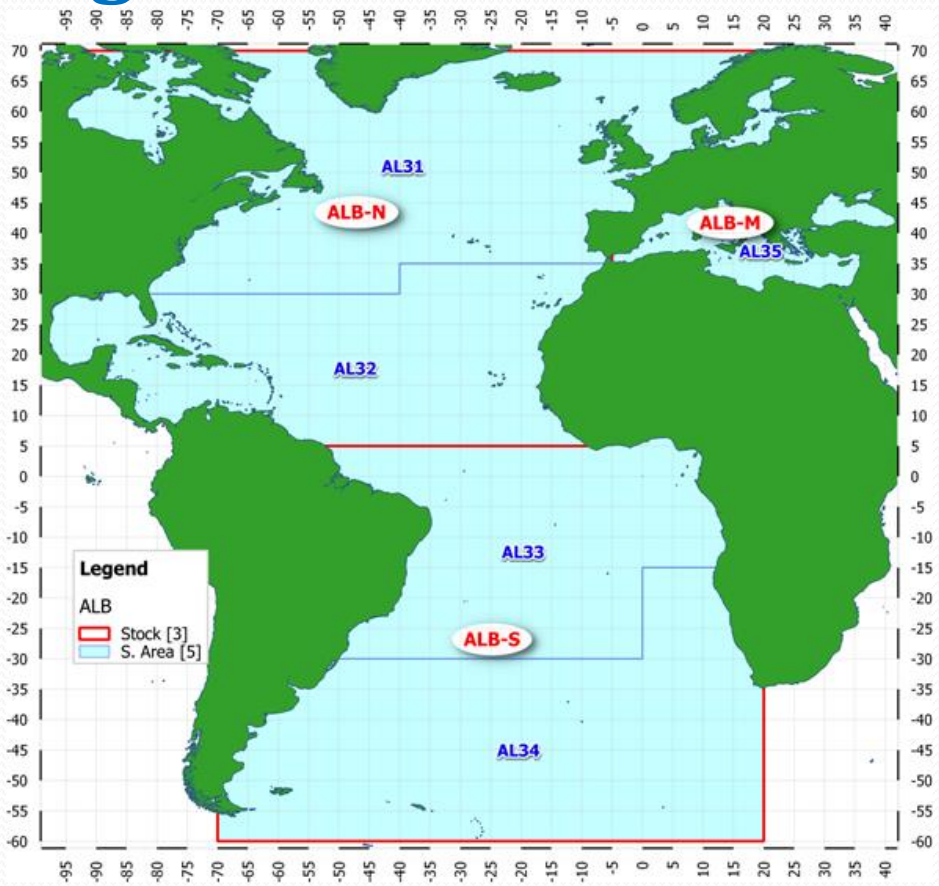
East and Mediterranean Bluefin tuna

- The Commission Panel 2 are currently reviewing and adoption of a Management Procedure for the Atlantic **BFT, expecting implementation for 2023**.
- Commission Decision in November Commission's Meeting
- Recommends the drafting of **the Exceptional Circumstances** provisions for the **Atlantic BFT MSE** in 2023.
- **Continued funding to support the essential work of GBYP**, including funding of the MSE development process, biological studies and the full **GBYP** workplan.

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 unknow)
- **MED-ALB Stock Assessment** in **June 2021** with data until **2019.**
- Management through input control measures (e.g. vessel list, temporal fisheries closures)

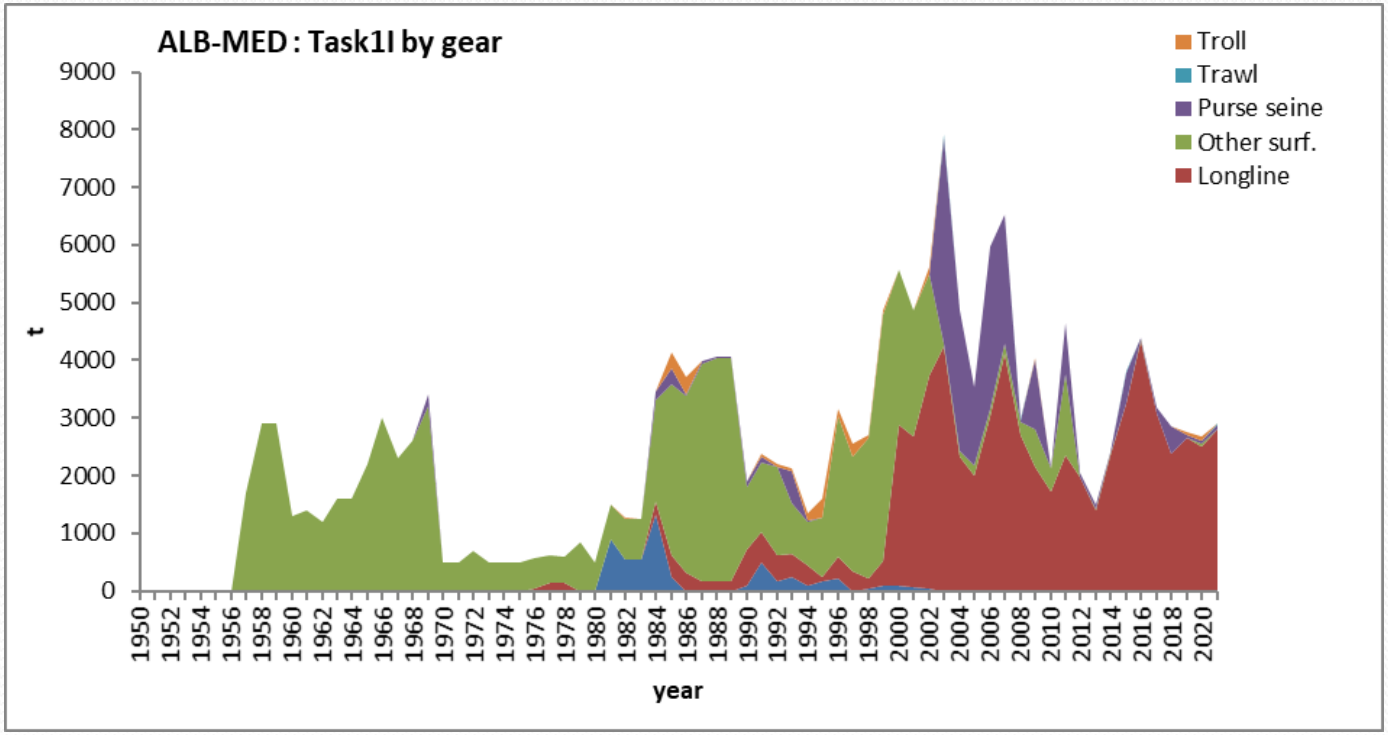


Objective:

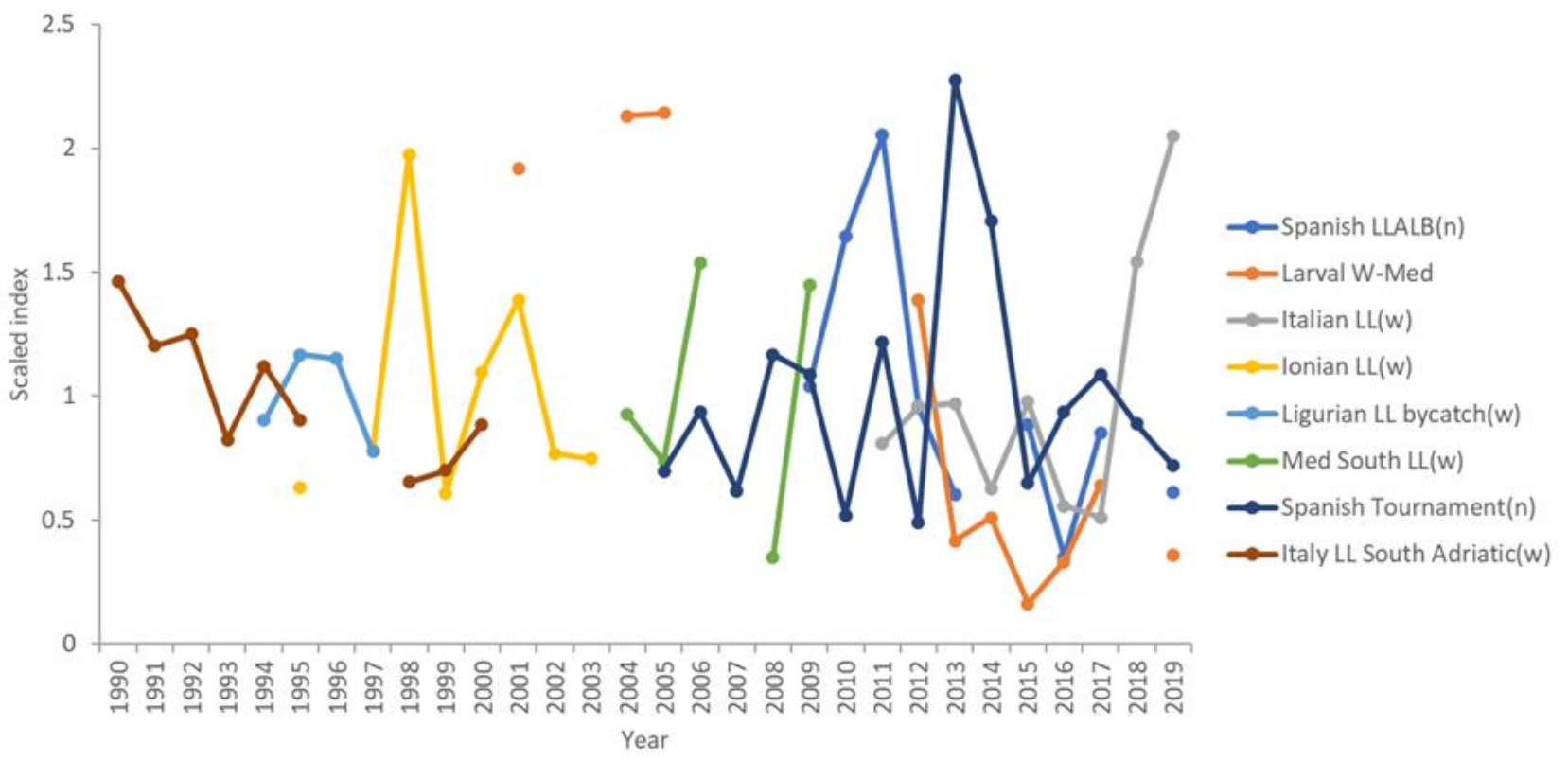
- Maintain the stocks at level which will permit maximum sustainable catch for food and other purposes

Fisheries

- Production in the Mediterranean:
  - Catch peak of 7,898 t in 2003, average of 2,845 t period 2010-2020
  - 2,863 t in 2018; 2,762 t in 2019; 2,675 in 2020 and **2,901 t** in **2021**.
  - Uncertainty of non-reported catches in the Mediterranean (IUU).

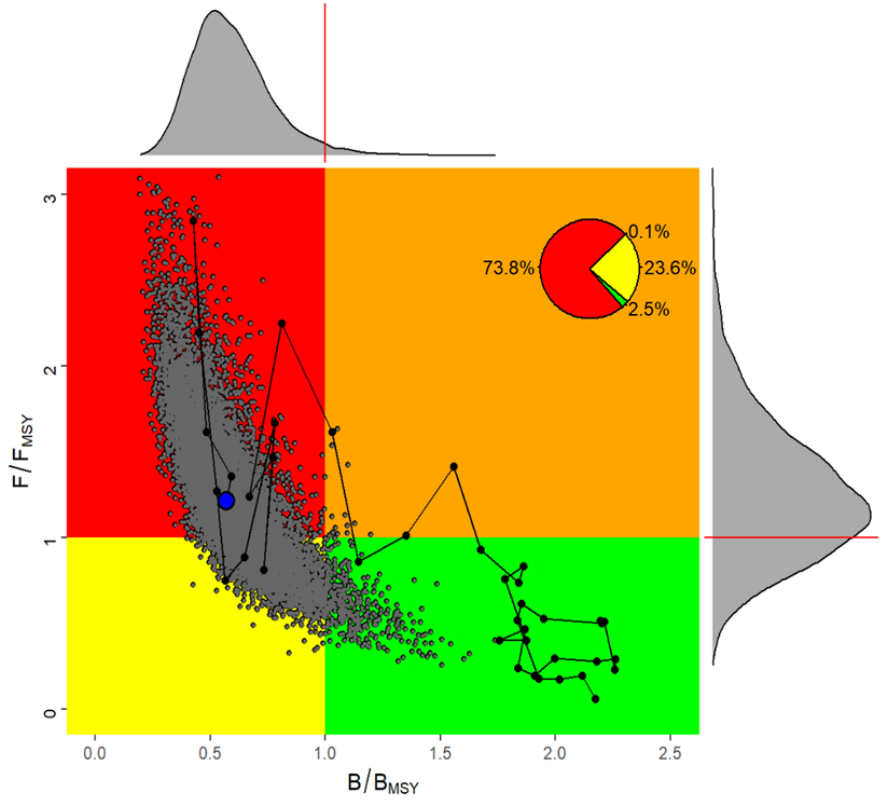


Indices of Abundance



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]
Current (2021) Yield	2,901 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. 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, specially for fishing mortality (Wide confidence intervals 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 last three years (2017-2019) would allow the stock to recover to the green quadrant of the Kobe plot with a greater than **60%** probability by 2032.
- However, this level of fishing also has a **13%** probability of reducing B/B_{MSY} below 0.2 in 2032.

SCRS Recommendations

Mediterranean Albacore

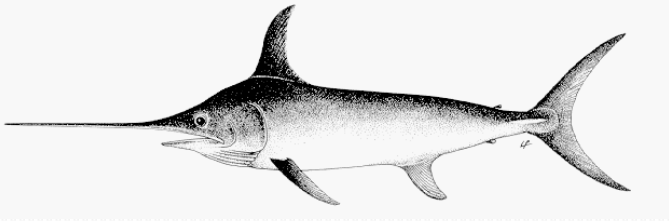
- The Committee supports **the continuation of larval data collection in the Balearic Sea** and **other spawning areas** (e.g., central and eastern Mediterranean), and recommends further research related to the use of larval indices to complement fisheries dependent data in stock assessments, including development of larval habitat models, corrected abundance indices and their impact in the assessment.

- The Committee recommends a network of researchers be established to work intersessionally on the development of a comprehensive and coherent research plan for the Mediterranean albacore stock to be integrated within the Albacore Year Program (ALBYP) of the North and South Atlantic stocks research plans.

- The Committee **recommended increasing efforts to complete the Task 1 data for Mediterranean albacore**, this being one of the main uncertainties not quantified in the assessment. It was **requested that CPCs and Secretariat work together** to complete the task 1 data and to **consider methods** developed by the WGSAM **to estimate unreported of catches**.

MED Swordfish: Background information

Managed by ICCAT



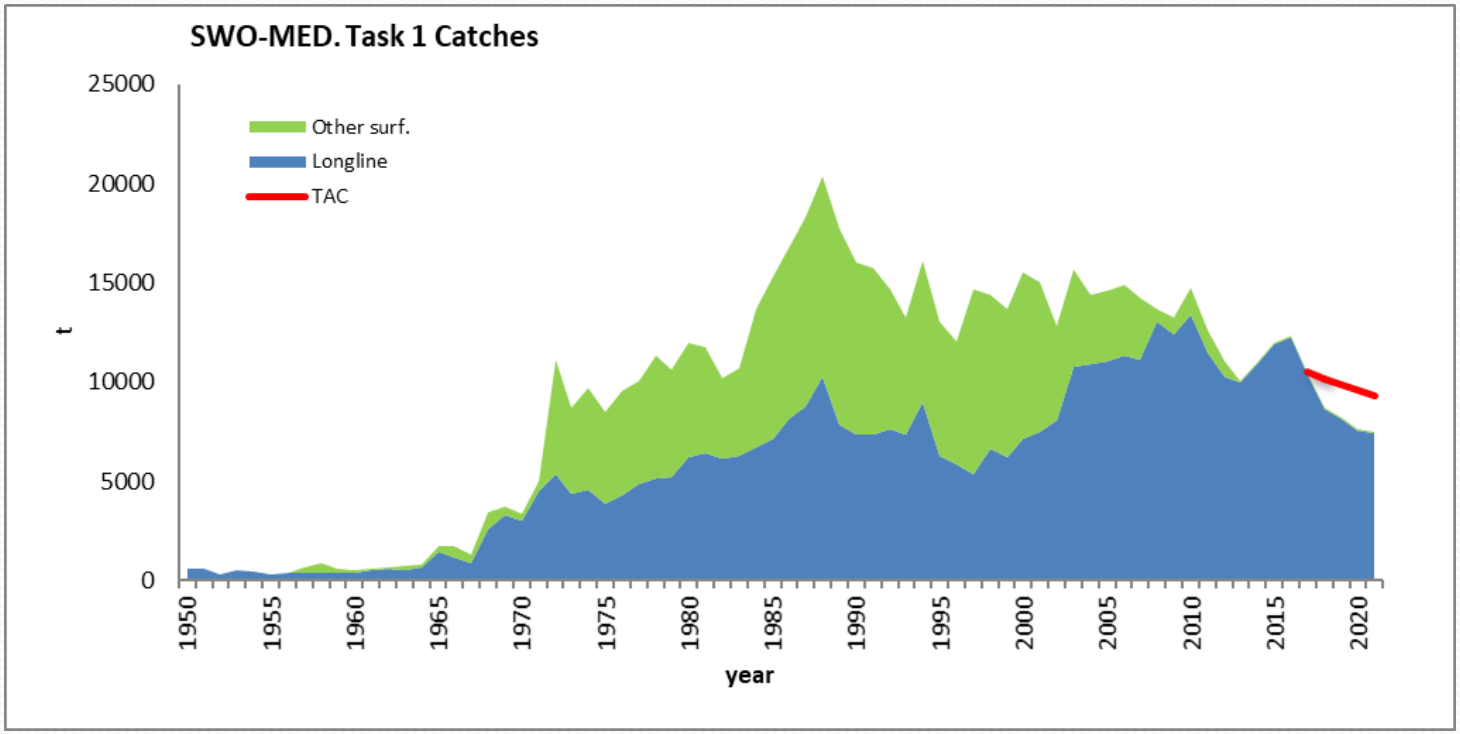
- Single stock unit with limited mixing with **N-ATL stock**
- Last Assessment **June 2020**
- Management through input control measures (e.g. TAC, vessel list, min. size/weight, fisheries closures)

Objective:

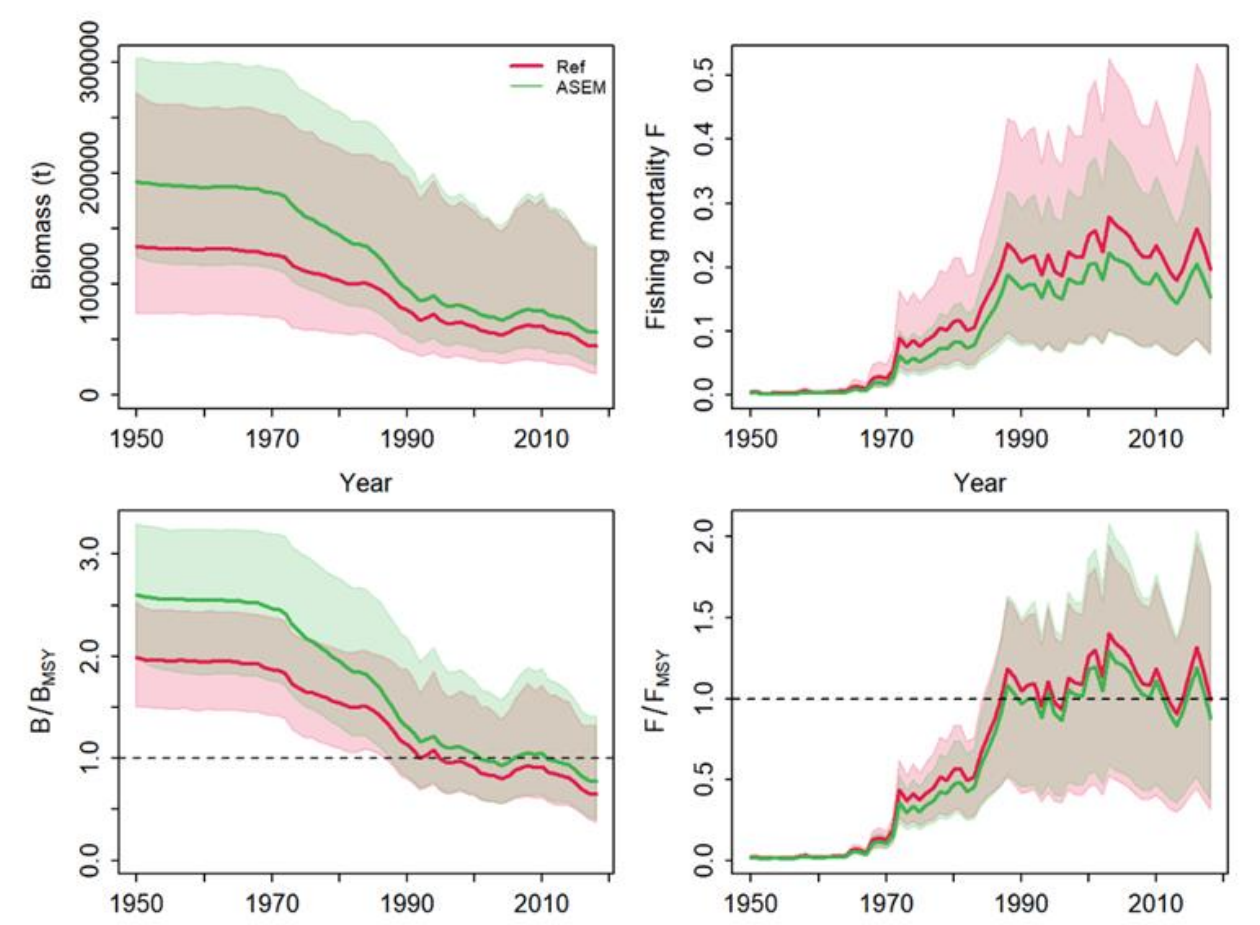
- Maintain the stocks at level which will permit maximum sustainable catch for food and other purposes

Fisheries

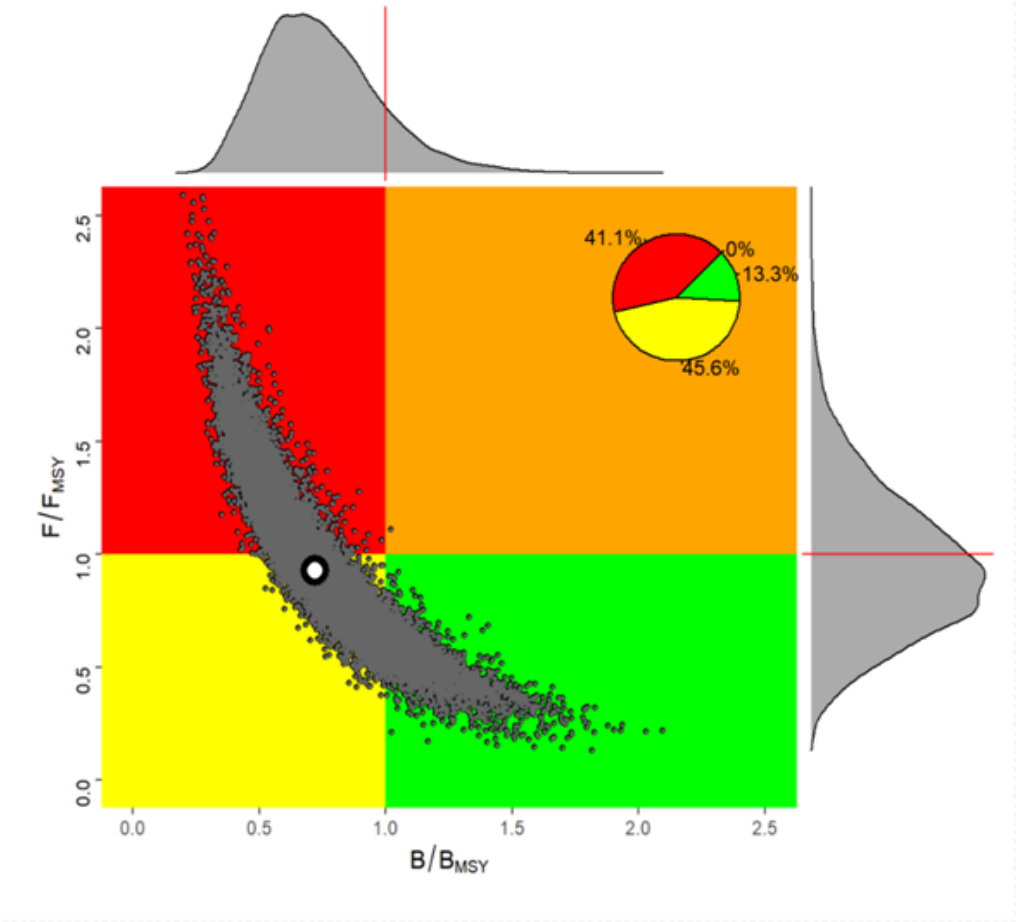
- Main gears: Longlines (surface, mesopelagic) and Gillnets (prohibited since 2012)
- Production declining in the recent years from 12,300 (2016) to 7,493 (2021).
- Catch in 2021 **7,493** t a 8% decrease compare to average catch 2018-2020 and below **TAC** (**9,296 t**).



Estimates of Task I swordfish catches (t) in the Mediterranean by major gear types, for the period 1950-2020. Non- reporting may occur 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]**
Current (2021) Yield	7,493 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

Mediterranean Swordfish

The next assessment should take place not before 2024 but, in order to monitor stock trends, essential fisheries indicators (e.g., catch, indices of abundance), should be reviewed in **2023**.

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.

Develop a workplan aiming to better identify the effects of the environment on swordfish biology, ecology and fisheries. Future CPUE analyses should evaluate the benefits of considering important climate and oceanographic changes that have occurred recently in the Mediterranean Sea (e.g., eastern Mediterranean transient) and may have impacted the availability of the stock to some fisheries, and/or the recruitment success of the population.

SCRS Recommendations ...

Mediterranean Billfish

- To resume and enhance **the collection of fishery data on Mediterranean spearfish and other billfish** which are present in the Mediterranean.

Please visit also the ICCAT 2022 meeting webpage

(2022 SCRS Advice to the Commission)*

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

Thanks for your attention