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

Working Group (WG2) on pelagic fishes - ICCAT

ICCAT Secretariat
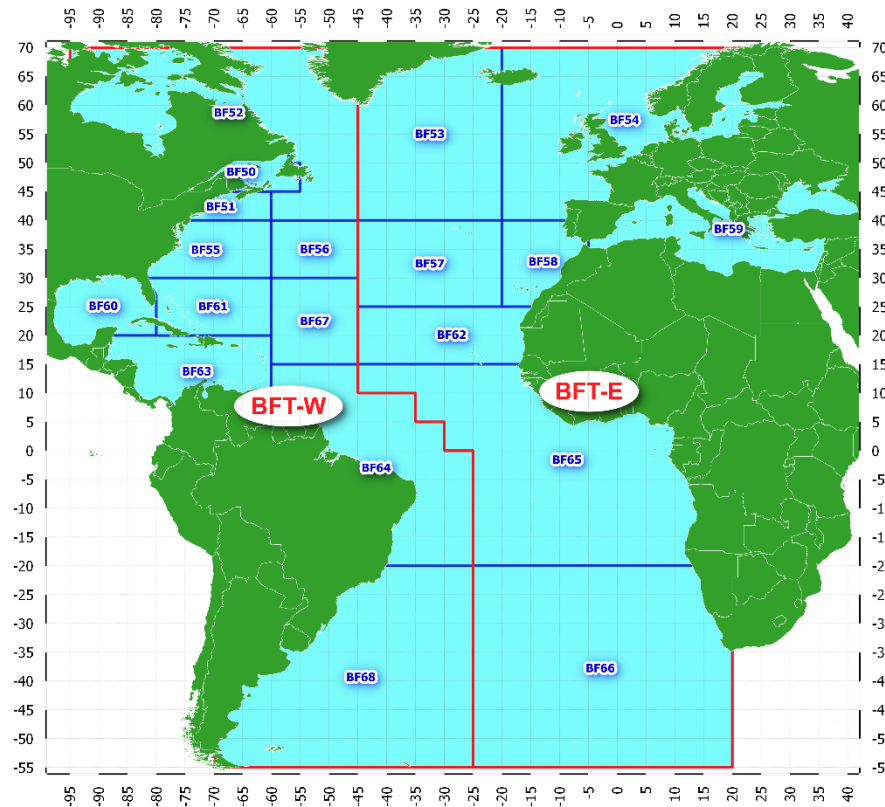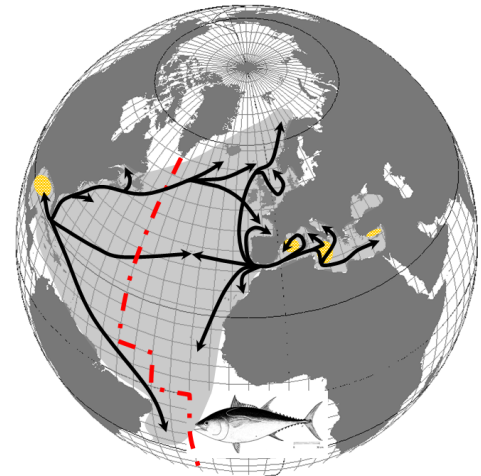
(29 September 2020)

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)

- Last assessment in July 2020

- Management through input control measures (e.g. vessel list, minimum size/weight, fisheries closures, TAC, etc.)
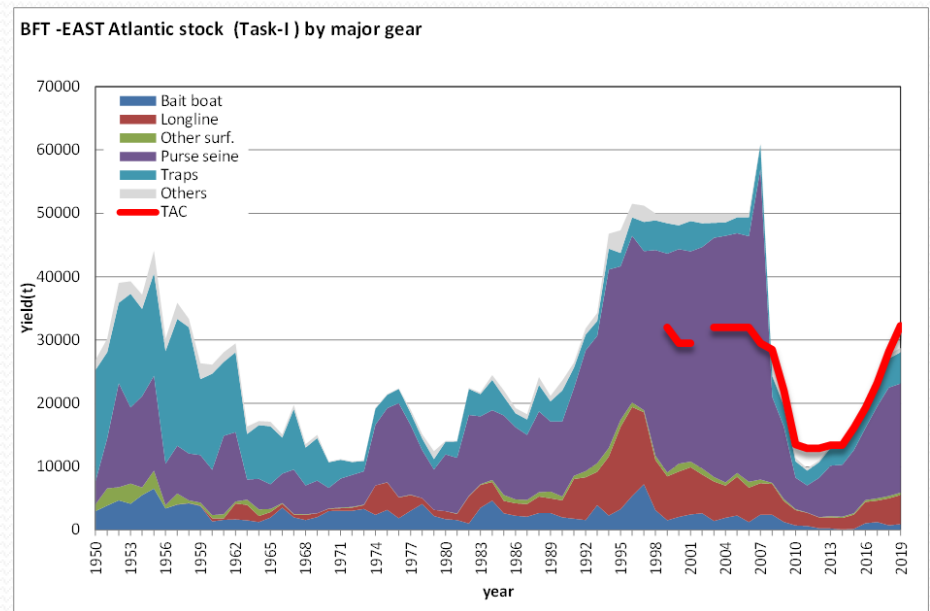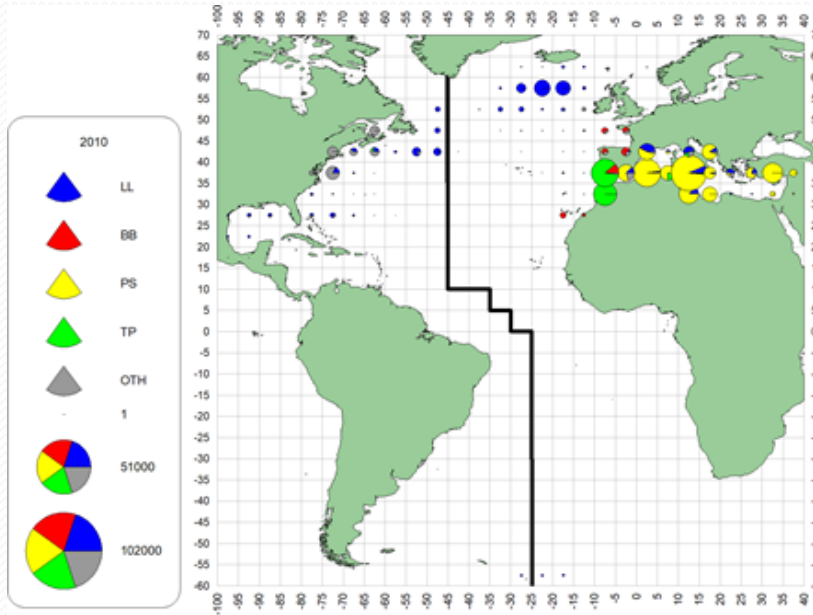
Objective:

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

Fisheries

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

Geographic distribution of bluefin tuna catches per 5x5 degrees and per main gears from 1990 to 2017.
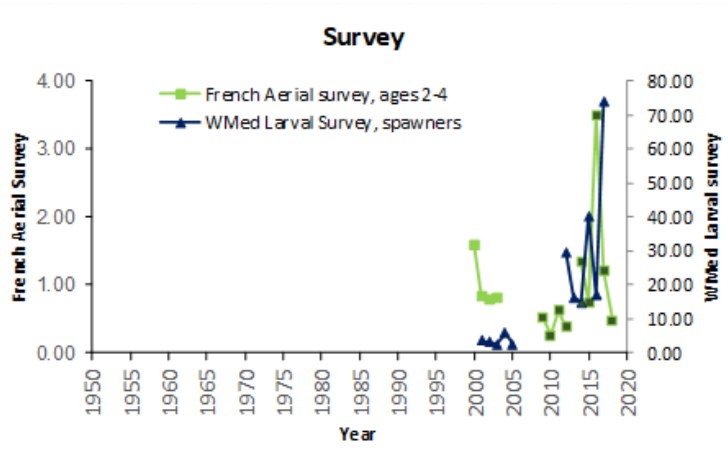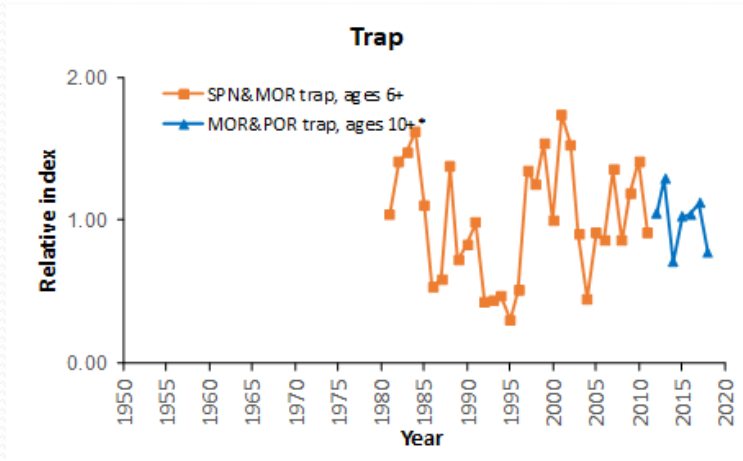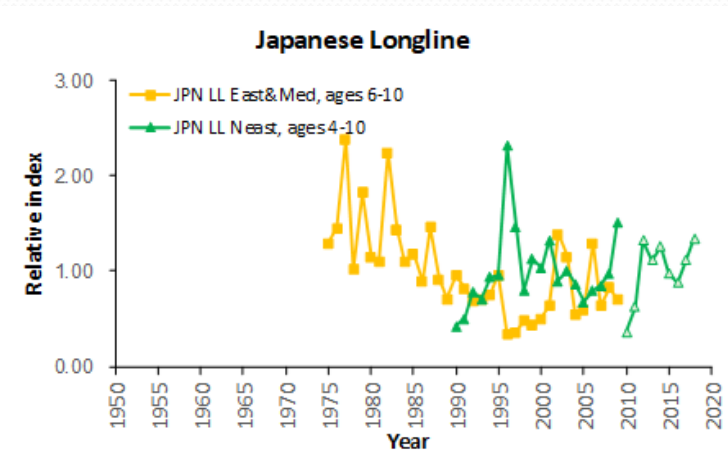
Fisheries

- Production:
  - ➢ Maximum catch estimated at 62,638 t in 2007.
  - ➢ Catch in 2019* 28,760 t TAC (**32,240**), of which 19,434 t (68%) in the Mediterranean Sea.

BFT -East Atlantic stock (Task-I) by region
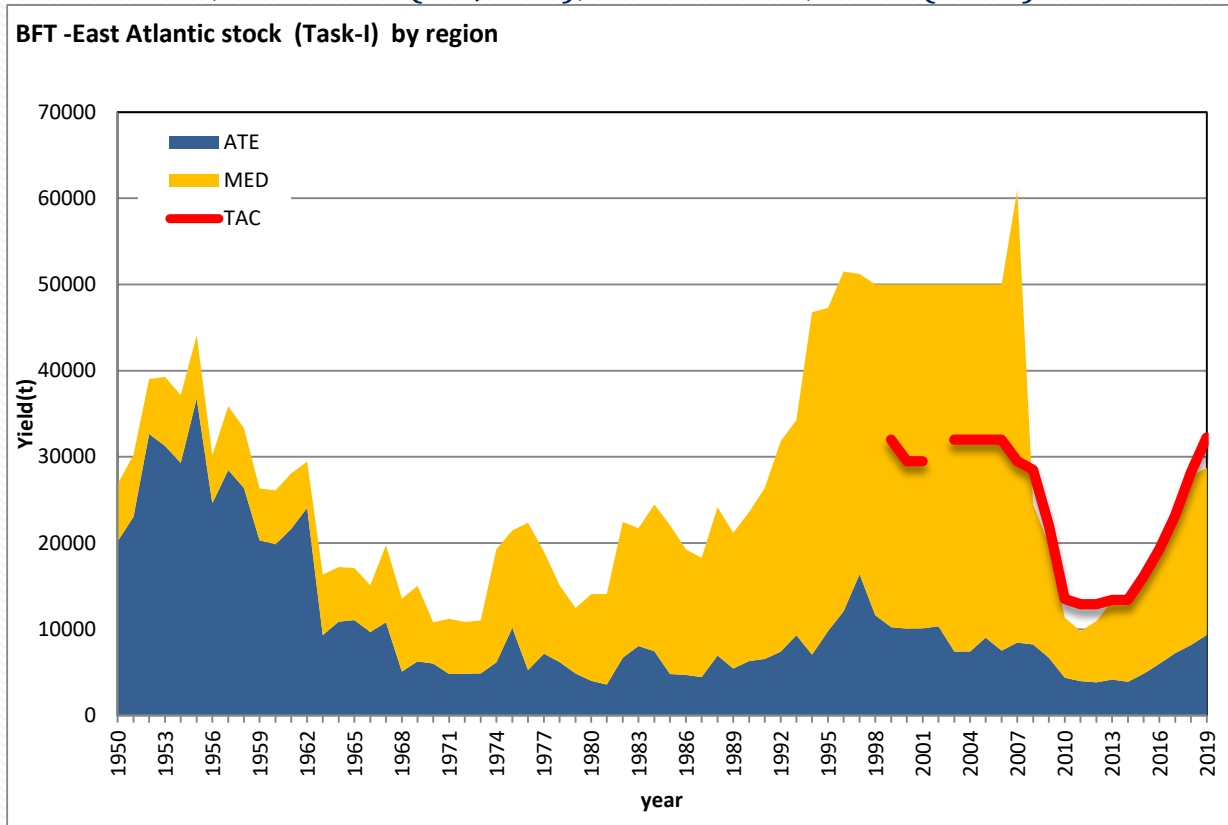
* Catch as of September 3, 2020.

Updated Fisheries dependent and independent CPUE indicators BFT East-Med stock
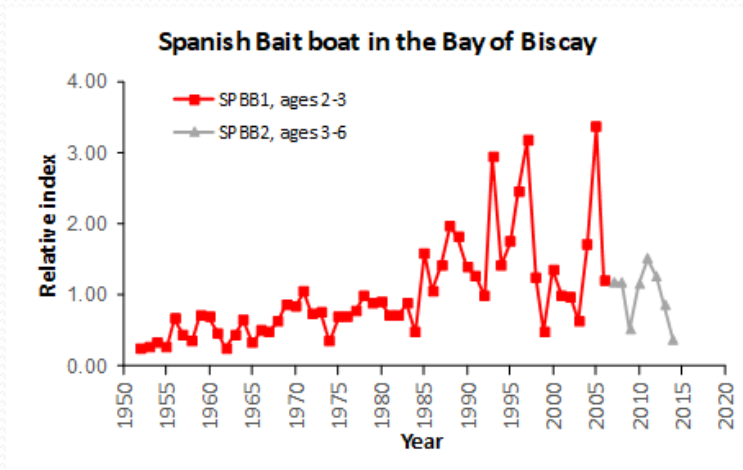
East Atlantic and Mediterranean Bluefin tuna summary 2020

Current reported yield (2019)	28,760 t*
$F_{0.1}$	$0.107\ (0.081\text{-}0.147)^{1}$
$F_{2015\text{-}2017}/F_{0.1}{}^{2}$	$0.426\ (0.359\text{-}0.502)^{1}$
Stock Status [3]	Overfishing: **NO**
Rec. 19-04 TAC 2019, 2020	32,240 36,000 t

1) Median and approximate 80% confidence interval from bootstrapping from the assessment.

2) $F_{2015\text{-}2017}$ refers to the geometric mean of the estimates for 2015-2017 (a proxy for recent F levels).

3) Biomass reference points to determine stock status were not estimated in the 2017 or 2020 assessment due to uncertainty in recruitment potential

* As of 3 September 2020.

Projections: Kobe matrix

Kobe II Strategy matrix showing probabilities (%) of $F < F_{0.1}$ for TACs from 18,000 to 50,000 t from 2018 through 2022 assuming a future average recruitment as estimated for 2006-2011.

Constant catches up to 36,000 t have higher than 60% probability of maintaining F below F0.1 throughout 2022

Catch (t)	2018	2019	2020	2021	2022
18,000	100	100	100	100	100
20,000	99	99	99	99	99
22,000	99	99	98	98	98
23,655	98	98	98	98	98
24,000	98	98	97	98	97
26,000	97	96	96	96	96
28,000	95	94	94	94	94
30,000	93	92	92	90	89
31,000	90	90	89	89	88
32,000	89	88	87	86	83
33,000	86	85	83	81	80
34,000	82	81	79	78	75
35,000	79	77	76	72	70
36,000	75	73	70	68	64
37,000	70	68	65	62	59
38,000	65	63	60	57	54
39,000	59	57	54	52	49
40,000	56	52	49	46	44
45,000	36	35	34	30	28
50,000	24	22	20	18	18

Executive Summary 2020 East BFT

- The Committee is of the opinion that the **MSE process is likely the best means of developing robust management advice** to the complexities of bluefin tuna including stock mixing, environmental variability and other uncertainties that affect current assessment advice. However, the **MSE process** is still in development.

- The Committee considers that recent recruitment estimates from the updated VPA assessment are highly uncertain and any short term catch advice based on F0.1 from the updated assessment would not be robust. Consequently, the Committee is not presenting new short-term projections. Due to the limited possibilities for improving the quality of the data, the Committee does not expect to be able to provide further clarity regarding future recruitment in 2021.

SCRS management recommendation 2020

- The Committee noted that **biomass indicators did not provide any evidence to alter the current management advice originally provided in 2017**. The Committee points out that the projections from the 2017 advice showed that a constant catch of 36,000 tons from 2018 onwards reflects F<F0.1 with a **probability higher than 60% in 2021 and in 2022**.

- Consequently, the Committee recommends that the **2020 TAC** [Rec 19-04 para. 5] of **36,000 t be maintained for 2021 and 2022**. However, the **TAC advice for 2022** will be reviewed in 2021 based on updates of the abundance indicators as has been done in recent years.

MED Albacore tuna: Background information

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

- Three stocks (mixing occurring and sub-population within in stock, but extent not know)
- Last assessment in **June 2017 MED stock**
- Management through input control measures (e.g. vessel list, temporal fisheries closures)
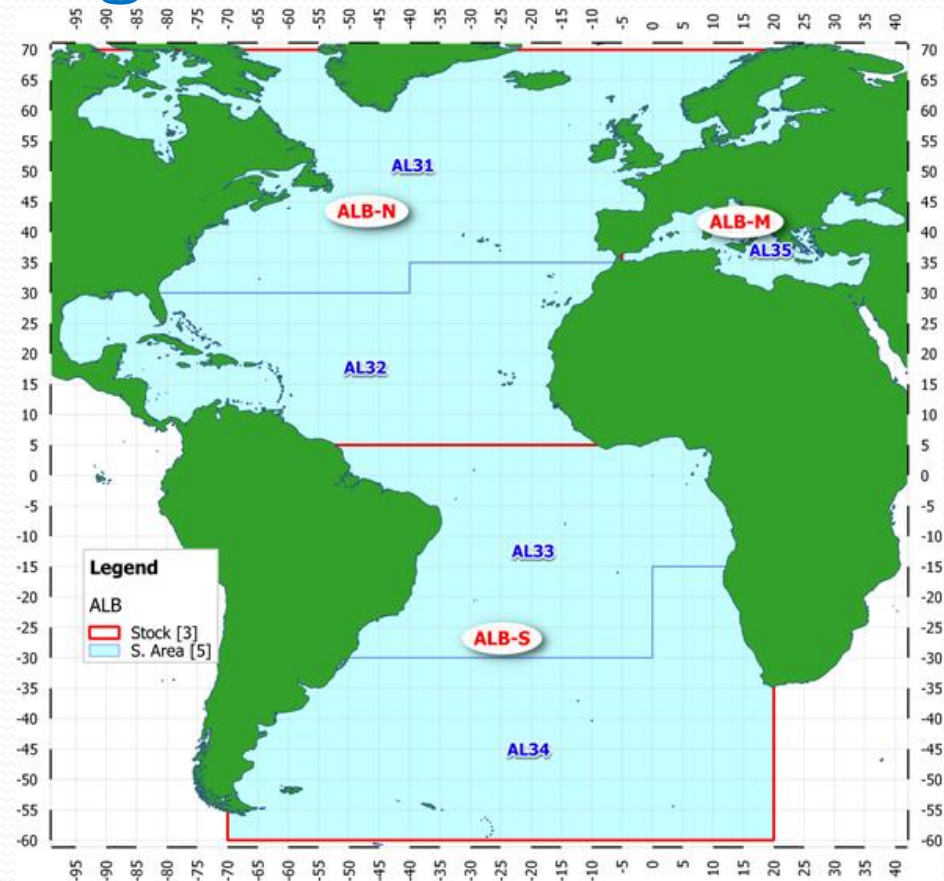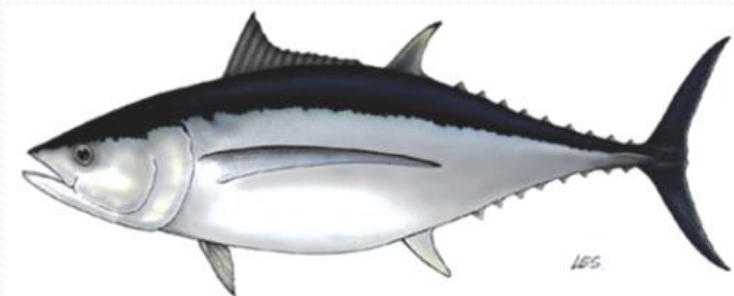
Objective:

- 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 2,819 t period 2010-2019
  - ➤ 4,319 t in 2016, 2,780 t in 2017, 2,434 t in 2018 and **2,402** t in 2019.
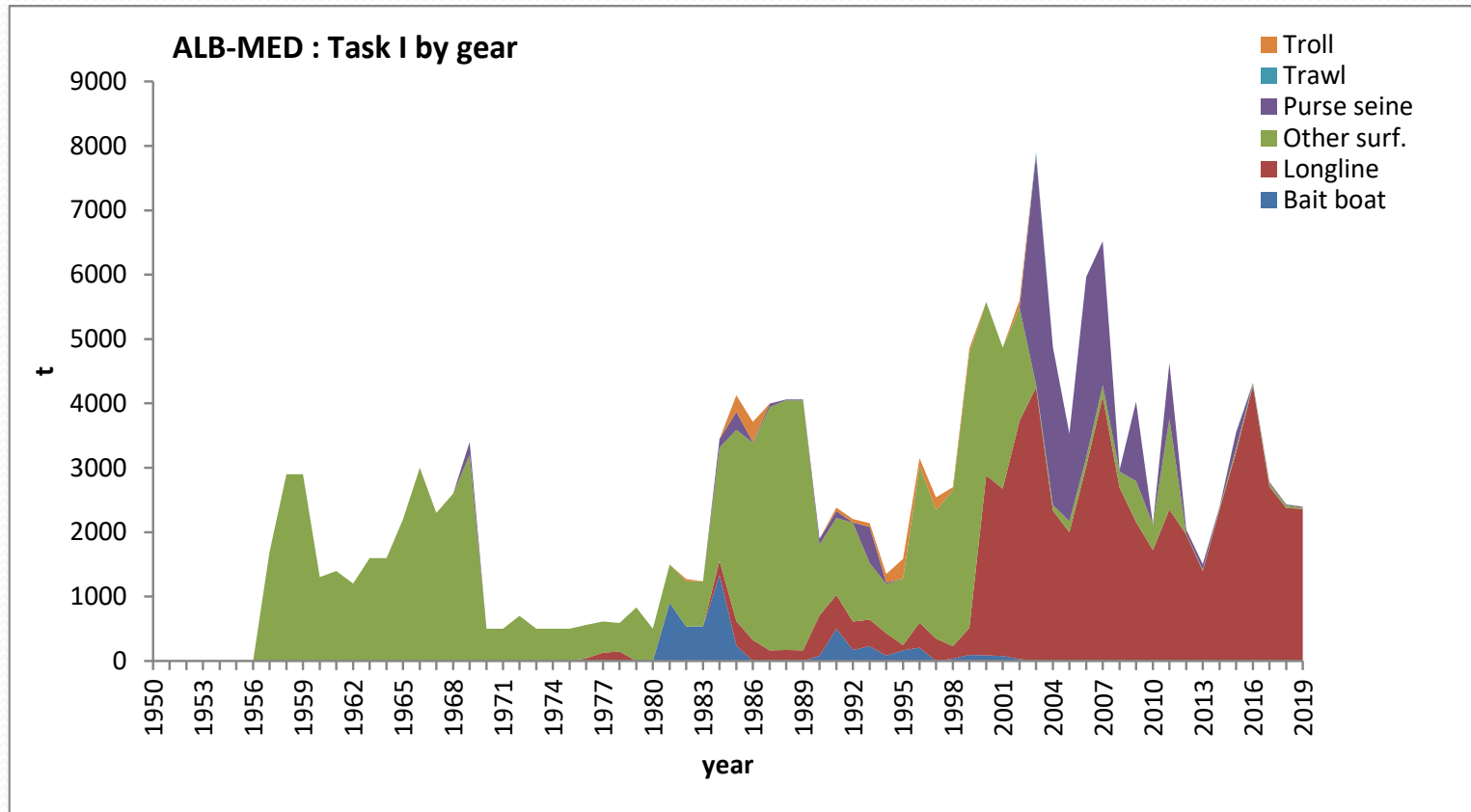
Fisheries

Geographic distribution of
Med-Albacore catches per
5x5 degrees and per main
gears from 2000 to 2017.

- Main gears:
  - LL
  - GN
  - OT (Trap Trawl Unk)
  - BB

Med-ALB mean annual catch (t) by 5x5 and main gear

Kobe plot – Stock status
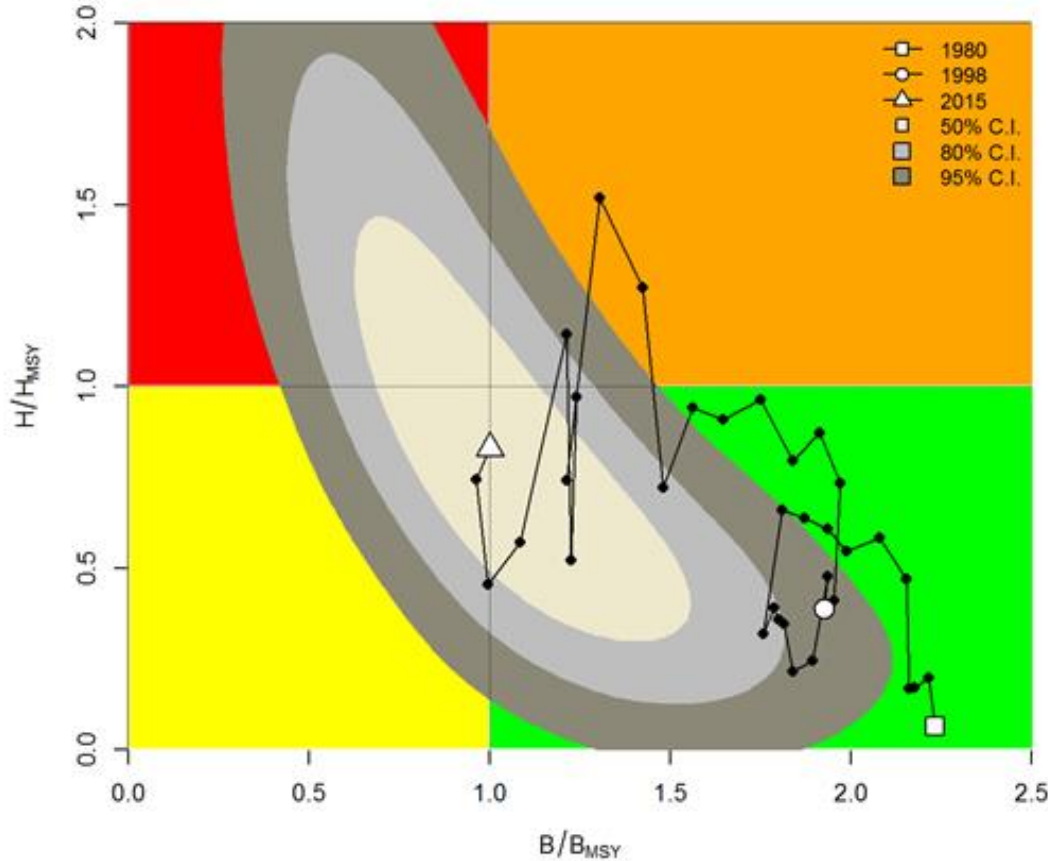
Stock status trajectories of B/B_{MSY} and F/F_{MSY}, as well as uncertainty around the current estimate (Kobe plots) for the Bayesian surplus production JABBA model.
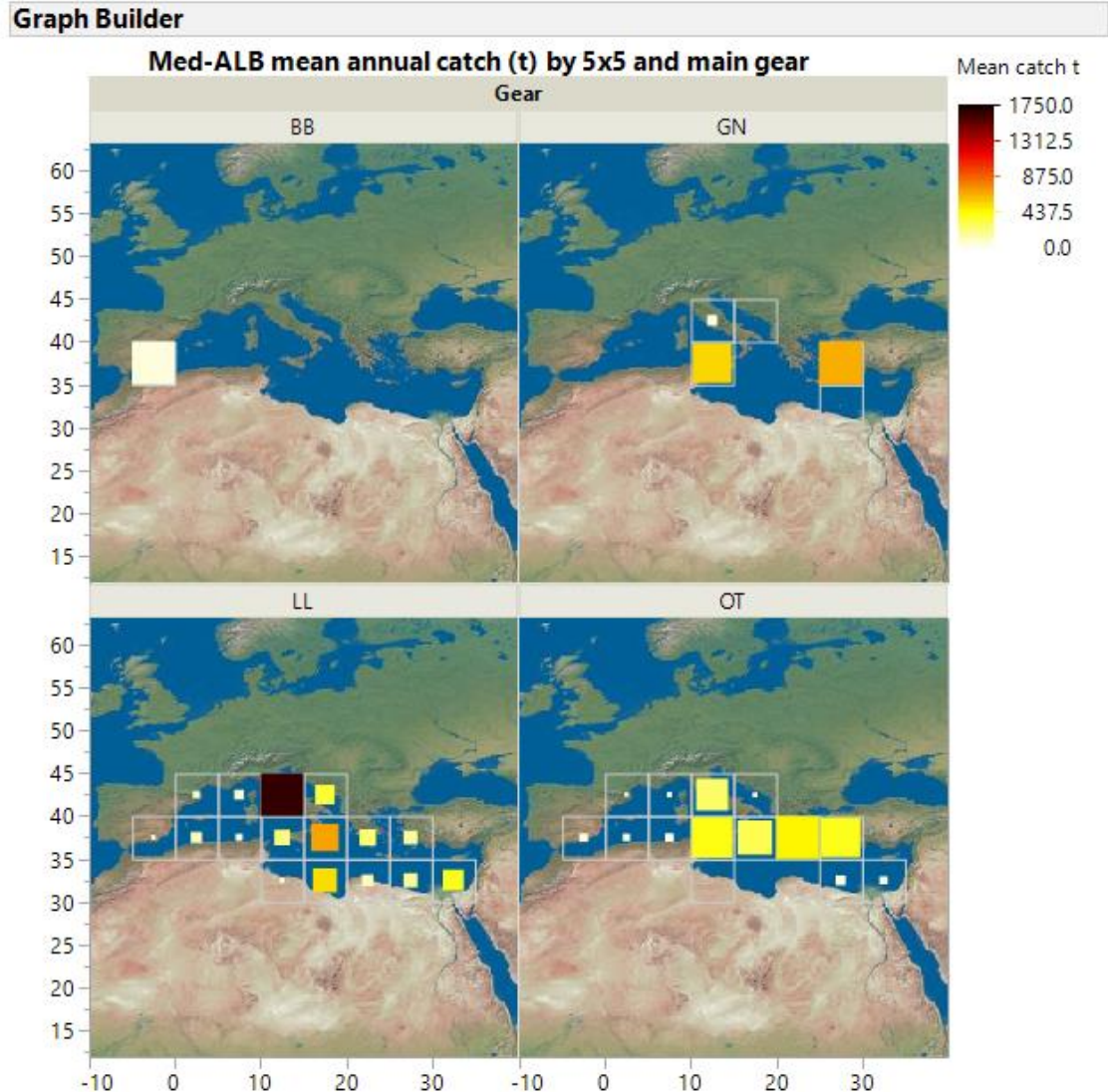
- Limited quantitative information is available to conduct a robust quantitative characterization on biomass status relative to MSY (Convention objectives).

- Despite the high uncertainty, the results seem to indicate that recent albacore median biomass levels are at about B_{MSY}, and median fishing mortality levels are below F_{MSY}
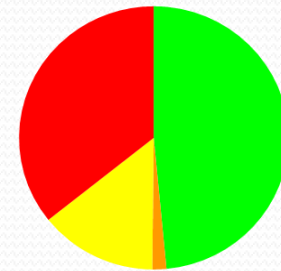
Probability of being overfished and overfishing (red, 36%), of being neither overfished nor overfishing (green 48%), of being overfished but not overfishing (yellow, 14.1%) and of overfishing but not overfished (orange, 1.7%).

Mediterranean Albacore summary in 2019

Maximum Sustainable Yield	**3,419** t (2,187-7,842)[1]
Current (2019) Yield	**2,402 t**
Yield in last year of assessment (2015)	**2,774 t**
B_{MSY}	**29,168 t** (17,939-65,861)[1]
F_{MSY}	**0.119** (0.072-0.192)[1]
B_{2015}/B_{MSY}	**1.002** (0.456-1.760)[1]
F_{2014}/F_{MSY}	**0.830** (0.223-2.194)
Stock Status	Overfished: **NOT LIKELY**
	Overfishing: **NOT LIKELY**
Management measures in effect:	• [Rec. 17-05]: Time closure of two months (1 Oct- 30 Nov) for longlines, protect Med swordfish juveniles. • A list of vessels authorized to target Mediterranean albacore implemented in 2017. • No increase of catch and effort until more accurate advice is delivered.

[1] Median and 95% CI for the base case.

Management recommendations

- Commission should institute **management measures** designed to **avoid increases in catch and effort** directed at Mediterranean albacore.

- The analyses suggest that catch levels as high as those in the years 2006-2007 (greater than 5,900 t) proved to be clearly unsustainable.

- Considering the high uncertainty regarding the most recent abundance trends, the Committee recommends to maintain catches below MSY at least **until the abundance trends are updated**. Level of catch depend on the level of risk the Commission is willing to take.

MED Swordfish: Background information

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

- Unique stock (limited mixing with the N. Atlantic one)
- **Last Assessment June 2020**, previous SA 2016.
- Management through input control measures (e.g. TAC, vessel list, min. size/weight, fisheries closures)
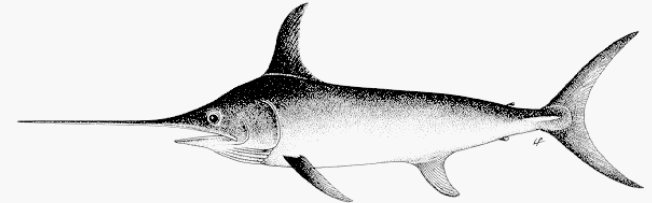
Objective:

- 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 around 10,000 t in the recent years, with a peak of 20,365 t in 1988
- Major fisheries (2003-2018): Italy (38%), Spain (20%), Greece (11%), Morocco and Tunisia (8%)
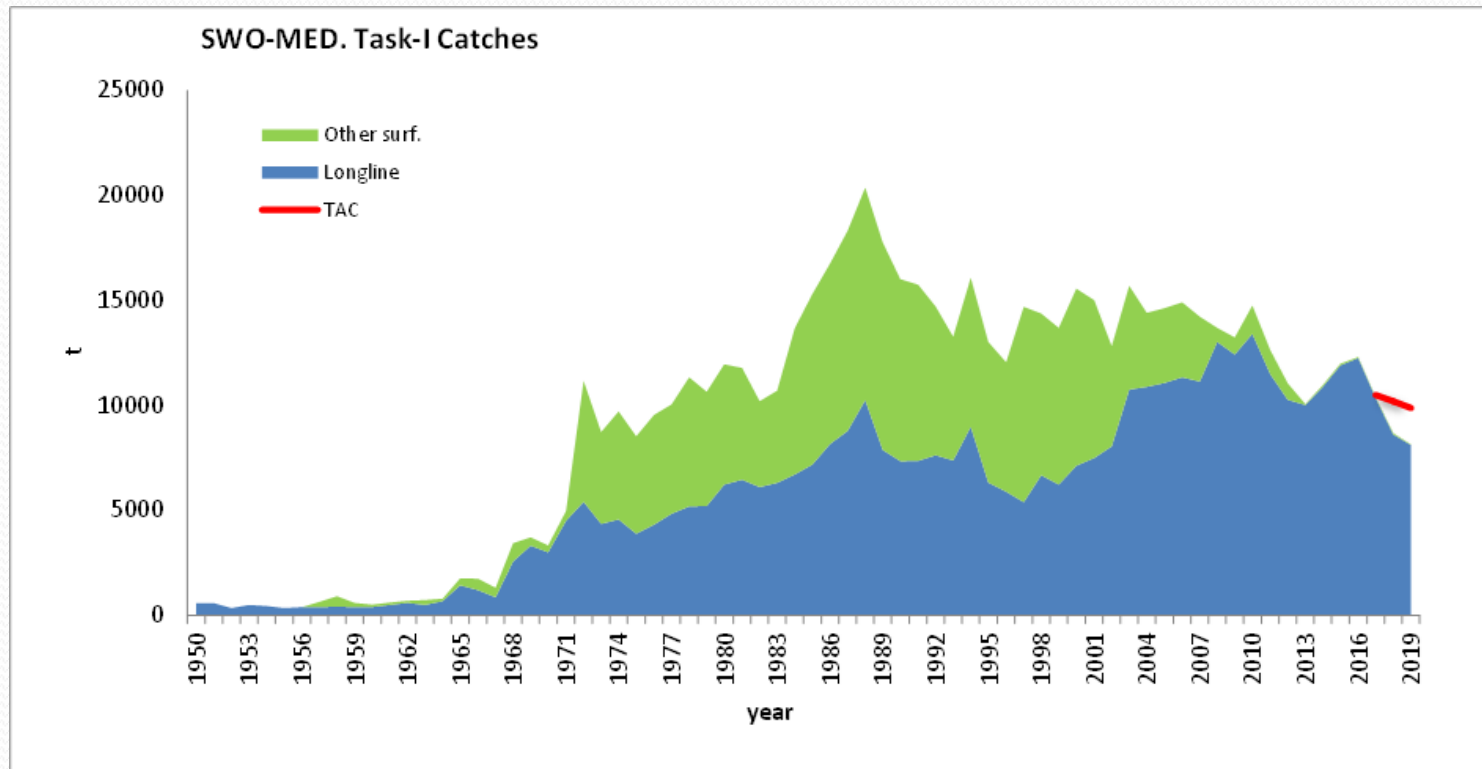
Estimates of Task I swordfish catches (t) in the Mediterranean by major gear types, for the period 1950-2019. Non- reporting may occur in the earlier period (up to the middle 1980s).
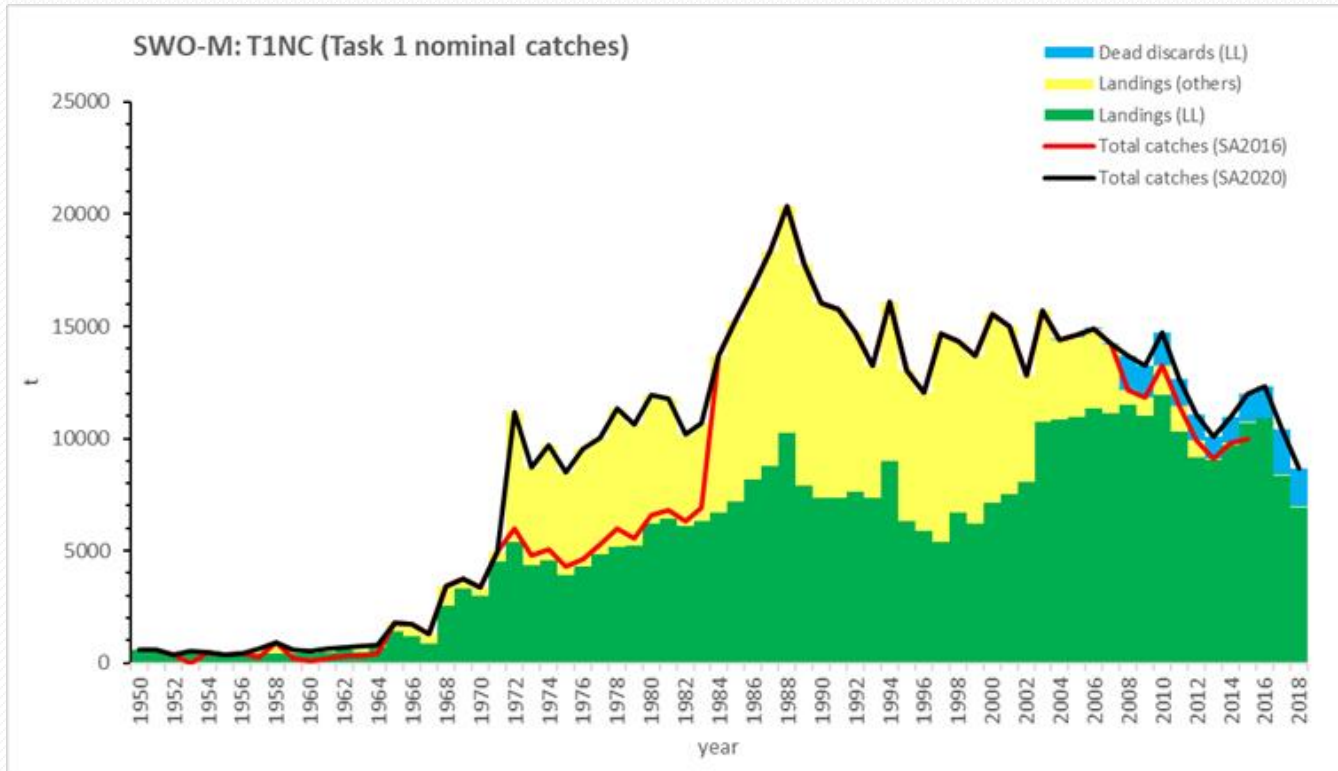
SWO-MED-Figure 2. SWO-M total nominal catches (T1NC, t) by year, showing total landings (LL and other gears) and dead discards (reported and estimated in SCRS/2020/028). The total catches used in the 2016 stocks assessment (SA2016) is shown for comparative purposes.
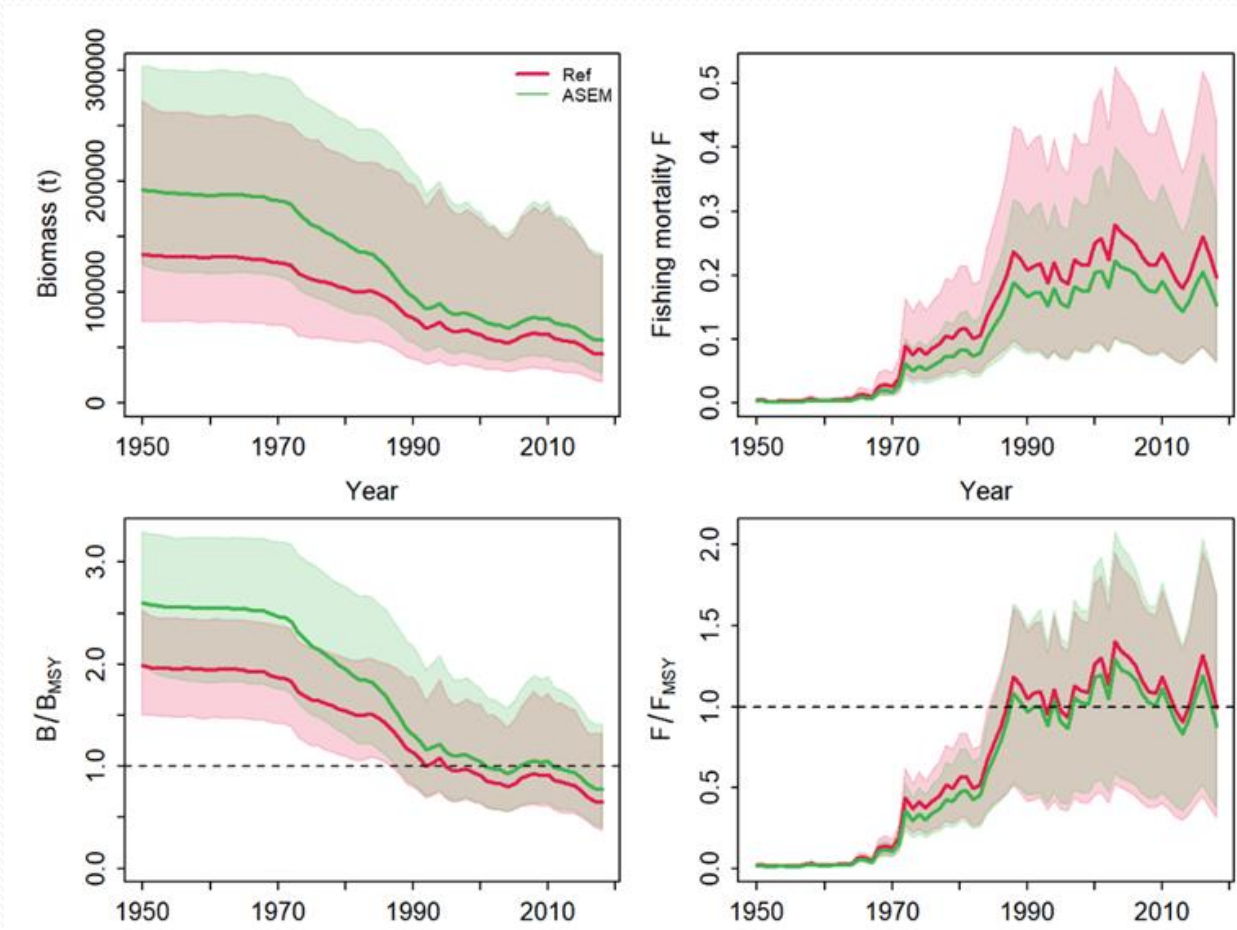
SWO-MED-Figure 3. Trends in biomass and fishing mortality (upper panels) and biomass relative to BMSY (B/BMSY) and fishing mortality relative to FMSY (F/FMSY) (bottom panels) for each scenario from the Bayesian state-space surplus production model fits to Mediterranean swordfish.
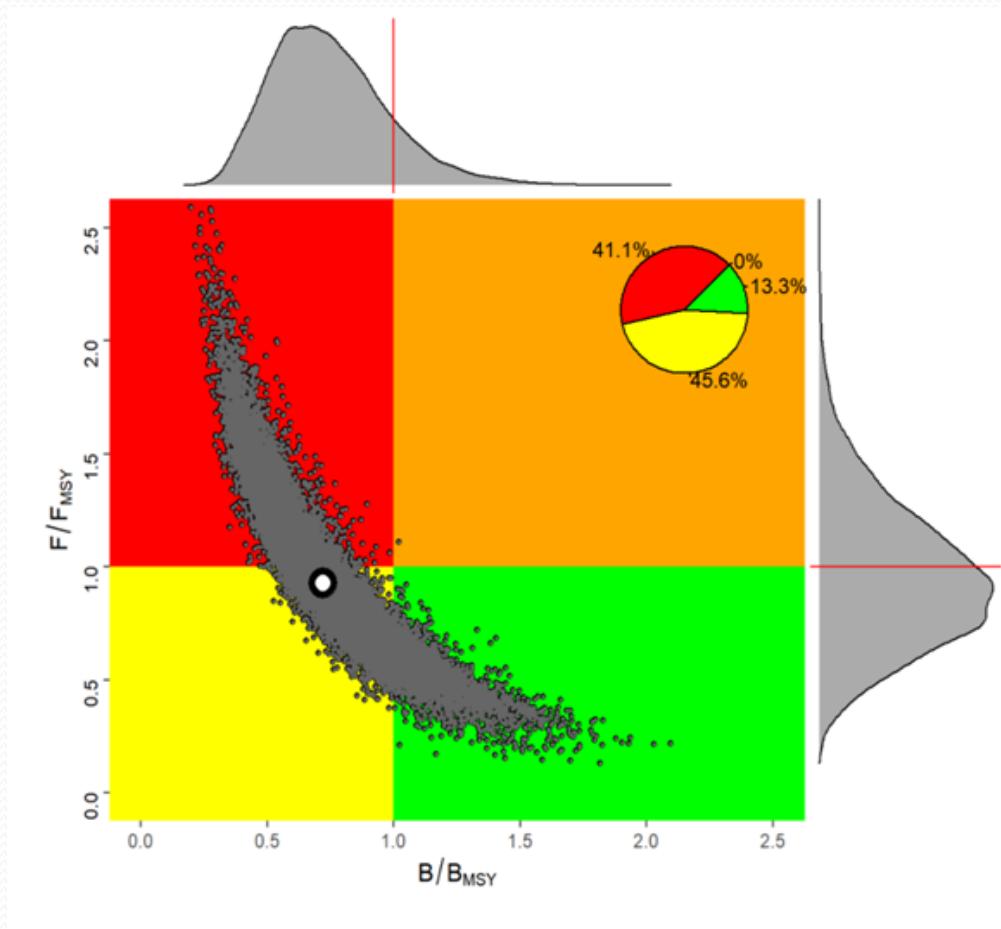
SWO-MED-Figure 4. Kobe phase plot showing the combined posteriors of B_{2018}/B_{MSY} and F_{2018}/F_{MSY} presented in the form of joint MCMC posteriors of JABBA model runs for Mediterranean swordfish. The probability of posterior points falling within each quadrant is indicated in the pie chart.

Mediterranean Swordfish Summary 2020

Maximum Sustainable Yield	**13,325 (10,899 – 17,346 t)[1]**
Current (2019) Yield	8,150 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 2020

- Over the last 50 years stock biomass shows declining trends, starting with the period around 1970-1990, when the fishery was in a strong developing phase. In the following period until about 2010, declining trends were rather modest accompanied by small-scale fluctuations. In the most recent period, the stock biomass has continued to decline.

- **Current stock biomass is about 30% lower** than that corresponding to MSY, while **fishing mortality is around F_{MSY}**.

- According to the Commission objectives the stock requires rebuilding and relevant scenarios were simulated assuming different levels of TACs.

- Analysis indicated that **the probability of stock rebuilding** by the end of the **projection period (2028) is 60%** if a **TAC equal to 10,000 t** is implemented.

- The probability increases if lower TACs levels are selected.

- As there are uncertainties on stock productivity, these estimates may be optimistic and should be interpreted with caution

TAC | Year	2021	2022	2023	2024	2025	2026	2027	2028
0	31	52	71	84	92	96	98	99
7000	31	41	51	59	67	72	77	81
8000	31	39	47	55	61	67	71	75
9000	31	38	44	50	56	60	64	68
10000	31	36	41	46	50	53	57	60
10250	31	36	40	45	49	52	55	58
10500	31	35	39	43	47	50	53	56
10750	31	35	39	42	45	48	51	53
11000	31	34	38	41	44	47	49	51
11250	31	34	37	40	43	45	47	49
11500	30	34	37	39	41	44	45	47
11750	31	33	36	38	40	42	43	45
12000	30	33	35	37	38	40	41	43
12250	30	32	34	35	37	38	39	40
12500	30	31	32	34	35	36	37	38
12750	29	31	32	33	33	34	35	35
13000	29	30	31	31	32	32	33	33
14000	25	25	25	25	25	25	25	24
15000	21	20	20	19	18	18	17	17

SWO-MED-Table 2. Estimated probabilities of the Mediterranean swordfish stock above B_{MSY} and below F_{MSY} (green zone) for a range of fixed total catches (0 – 15,000 t) over the projection horizon 2021-2028 based on joint projection MCMC posteriors of Surplus Production JABBA model runs.

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
- 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.

2020 SCRS Recommendations Mediterranean ICCAT species

East and Mediterranean Bluefin tuna

- Continue **MSE development process as primary objective**. Meetings of the Technical Group and with Managers 2021.

- **Continued funding to support the essential work of GBYP**, including funding of the MSE development process, biological studies and the full GBYP workplan, an external review of MSE.

- The Committee recommends **continued explorations of factors that may account for differential availability or catchability**. Continuation of the Joint CPUE Standardization work group. And, continued work in developing **alternative assessment models for E-BFT,** notable statistical catch at age/length models.

- The Committee **recommends support for workshops in statistical techniques for index standardization** and to develop a working network for analysts to facilitate the future sharing of knowledge and tools.

2020 SCRS Recommendations Mediterranean ICCAT species

Mediterranean Albacore

- The Committee recognized the lack of standardized CPUE data from the eastern Mediterranean. Thus, it is recommended that **CPCs predominantly fishing in this area (EU-Greece, EU-Cyprus and Turkey) should make a concerted effort to generate, and submit, standardized CPUE data**.

- The Committee **request funds for a short term-contract to support advances in larval studies in the Balearic Sea** and other spawning areas (e.g. central and eastern Mediterranean). In addition, it shall include tools for developing habitat standardized larval abundance indices.

- The Committee **recommends conducting a review and collation of all the available data on age-length** from the various studies that have estimated age from spines with the view to update the estimate of the growth curve for Mediterranean albacore. It is also recommended that methods of accounting for selectivity in the year 1 cohort in von Bertalanffy growth function (VBGF) be explored to ensure accurate parameter estimation.

2019 SCRS Recommendations ...

Mediterranean swordfish

Improvements in historical T1 and T2 data compared to 2016 assessment. However, the available CPUE data for the earlier period are still limited and the early period of the fisheries cannot be fully accounted. It is **recommended conducting a recovery of historical data,** so that the entire history of the fishery is taken into account when assessing the stock.

Research funding for biology and stock structure, including age, growth and reproductive studies, as well as stock structure and mixing. Given the **current uncertainties that still exist, the Committee recommends as high priority to continue biological studies on Mediterranean swordfish**.

Data from the **Domestic Observer Programmes** (ST-09) are essential for providing high resolution information on **undersized catches and discard rates for Med swordfish fisheries**. It is recommended (a) including the mesopelagic and American style longline in the gear selection list, (b) better clarifying the selection of depth range for the fishing operations, (c) having all information in the ST-09 forms to be completed.

2020 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.

Visit also the ICCAT 2020 meeting webpage

(2020 SCRS Advice to the Commission)

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

Thanks for your attention