

SCRS Report 2021 - PANEL 4

Swordfish

Billfishes

Sharks

Small tunas

ICCAT

CICTA

CICAA



Main contents of this presentation

- Billfishes
 - Not assessed in 2021.
 - Summaries from previous assessments and fishery statistics (BUM, WHM, SAI)
- Swordfish
 - Not assessed in 2021.
 - Status from previous Atl and Med assessments and fishery statistics.
 - Summary update on N-ATL Swordfish MSE
- Small tunas
 - Updates on the progress of work
- Sharks:
 - Not assessed in 2021
 - Summaries from previous assessments and statistics
- Responses to the Commission
- Recommendations with financial implications



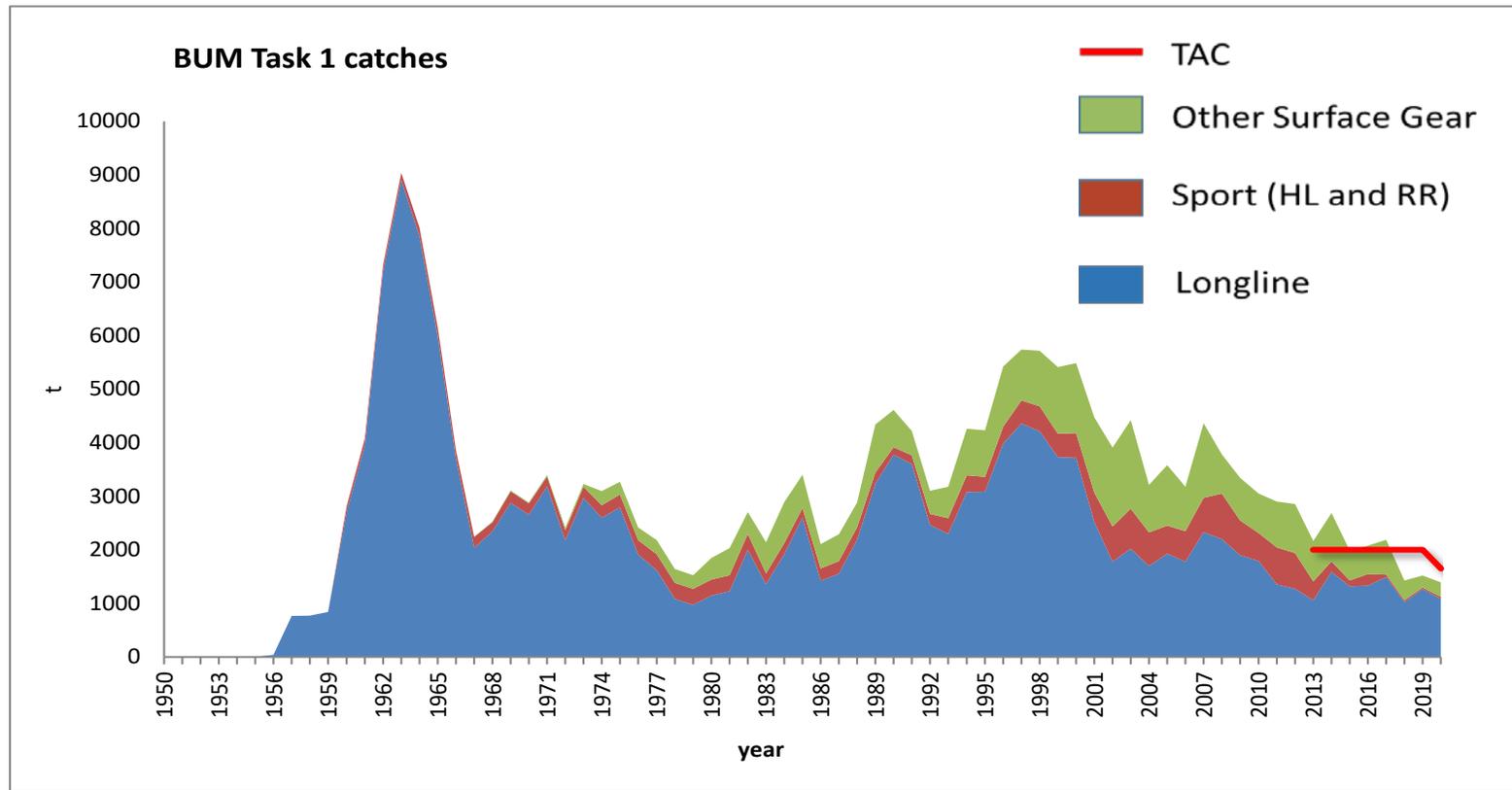
Summary of billfishes – *BUM, WHM, SAI*





Blue marlin annual catch by gear

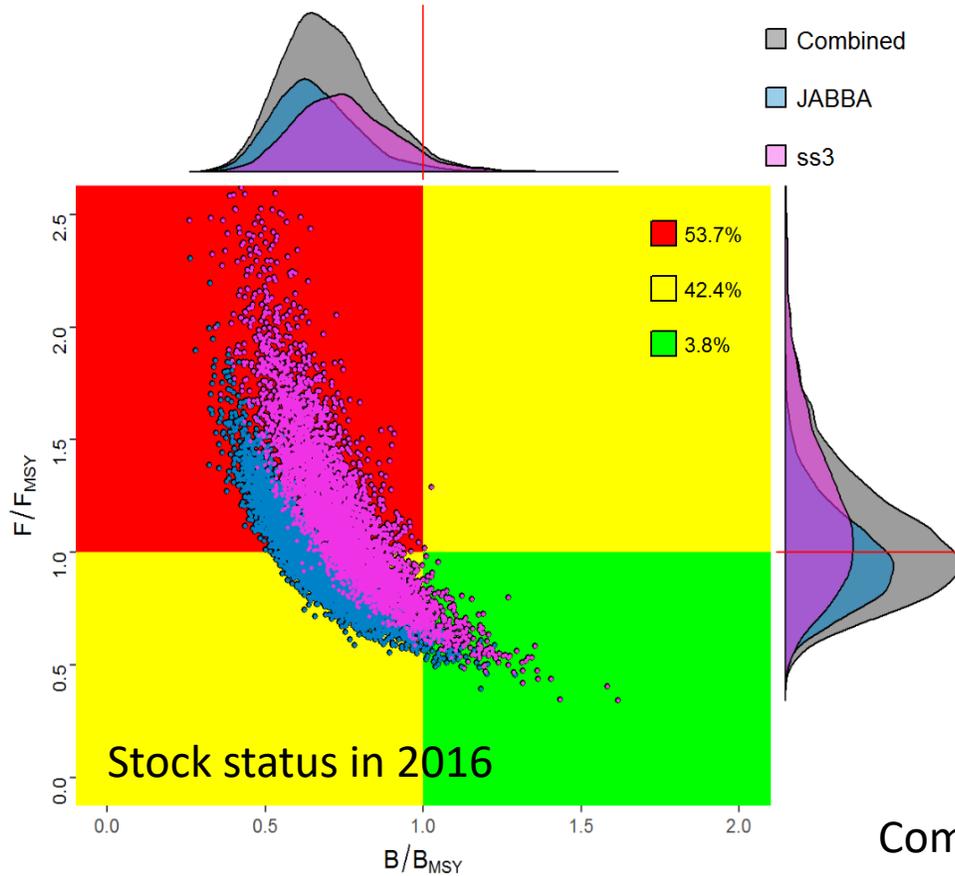
Catch (2020): 1,391 t
TAC (2020): 1,670 t





Blue marlin status

- Last assessment in 2018 (estimates of stock status for 2016)
- Results showed that the stock was **overfished and undergoing overfishing.**

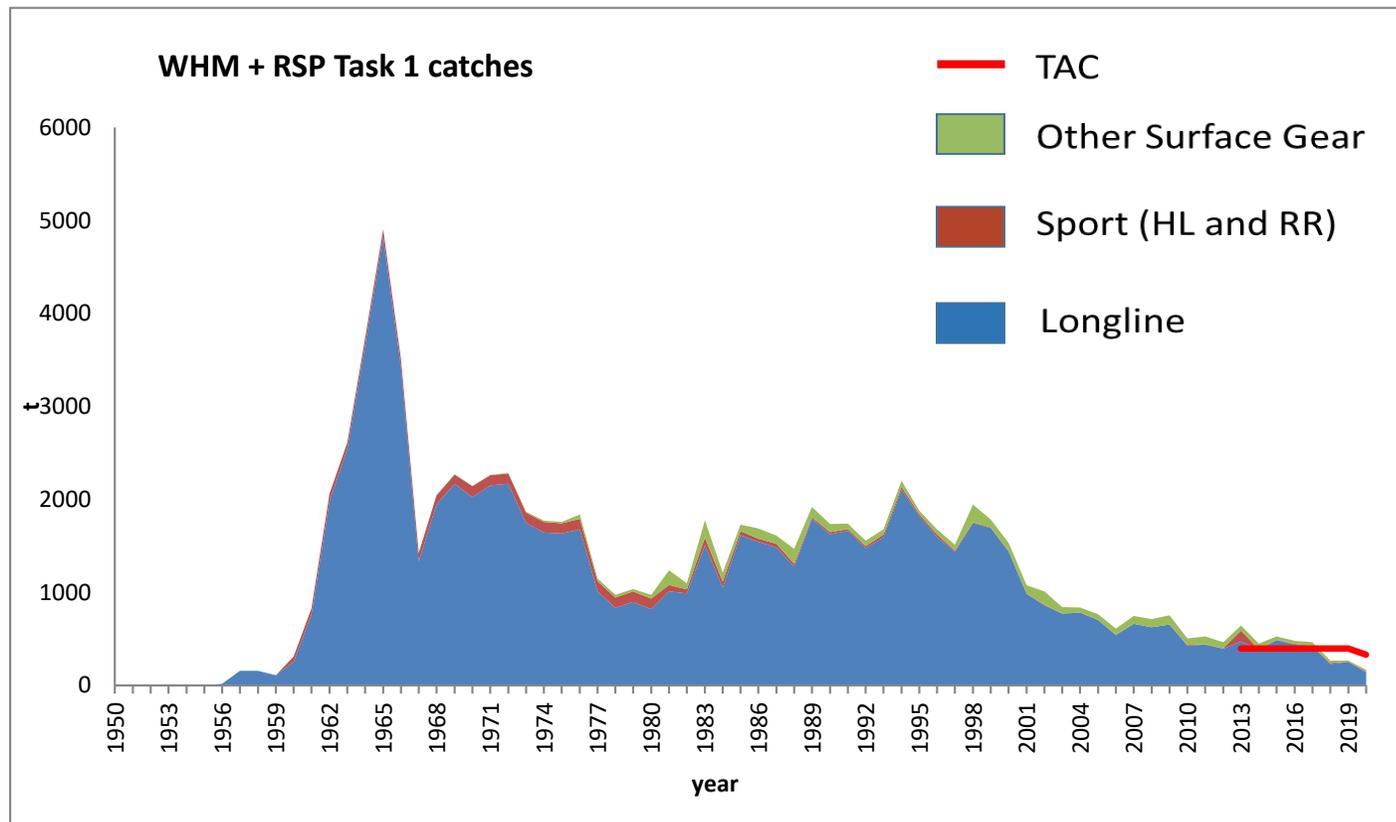


Combined Kobe plot from production and integrated models



White marlin annual catch by gear

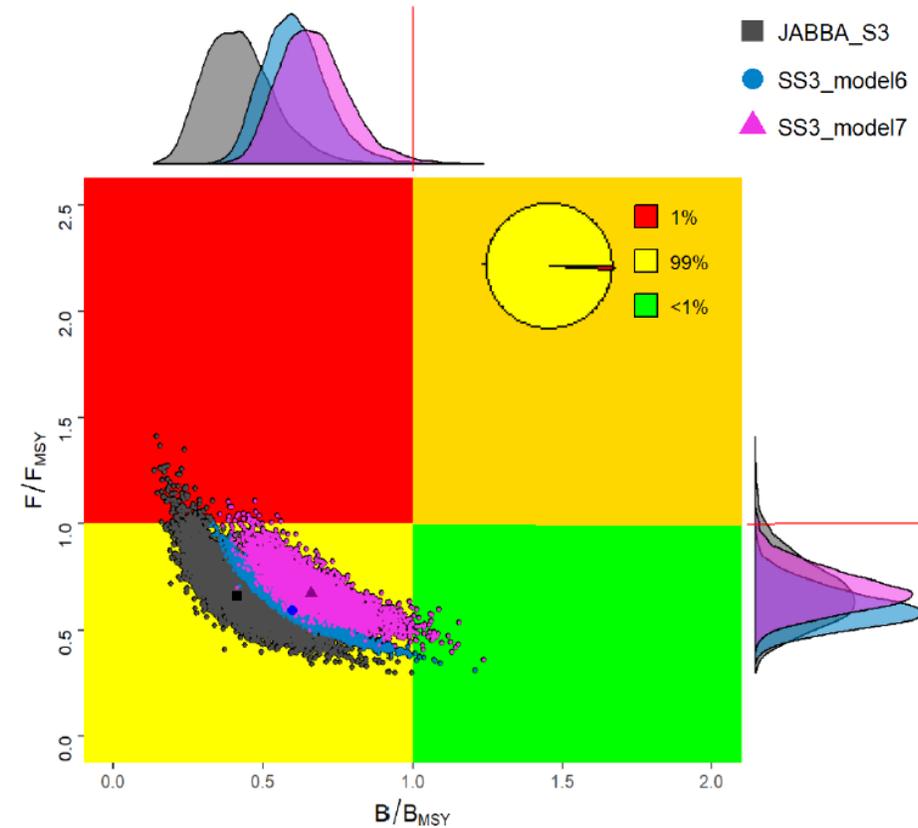
Catch (2020): 170 t
TAC (2020): 355 t





White marlin status

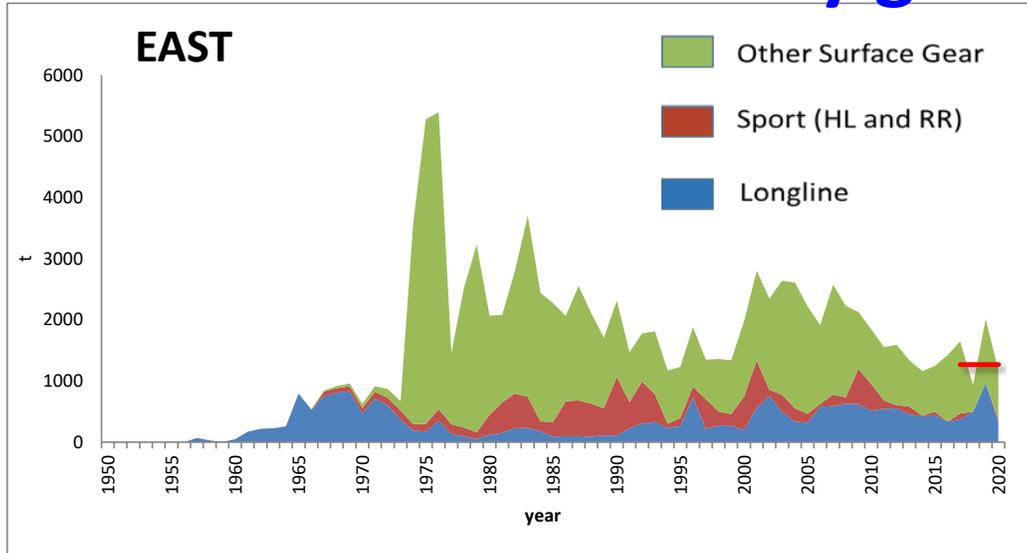
- Last assessment in 2019 (estimates of stock status for 2017)
- Results showed that the stock was **overfished but not undergoing overfishing**.



stock status (last data: 2017)

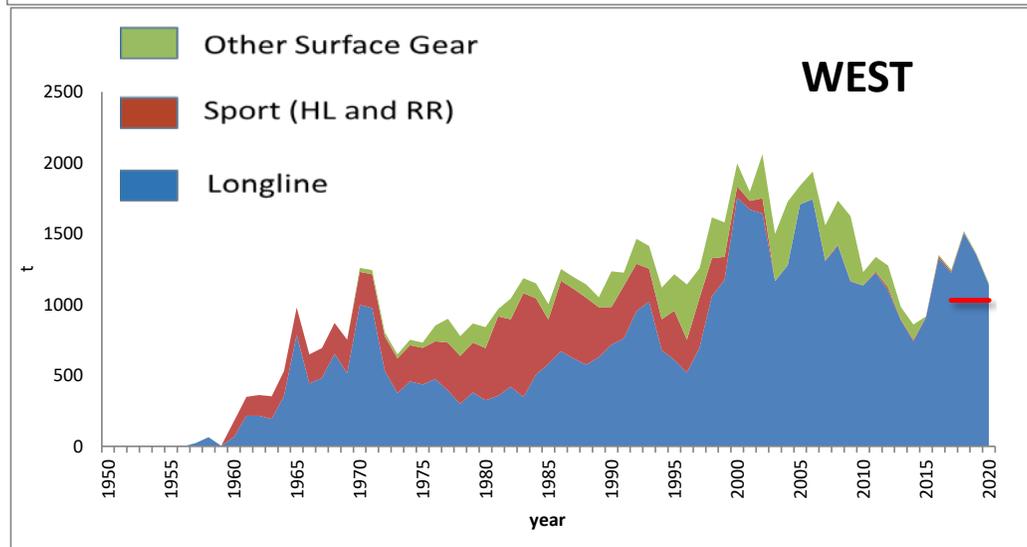


Sailfish annual catch by gear



East Stock

- Catch (2018: 935 t; 2019: **2,015 t**; 2020: 1182 t)
- TAC (2017-2020): 1,271 t

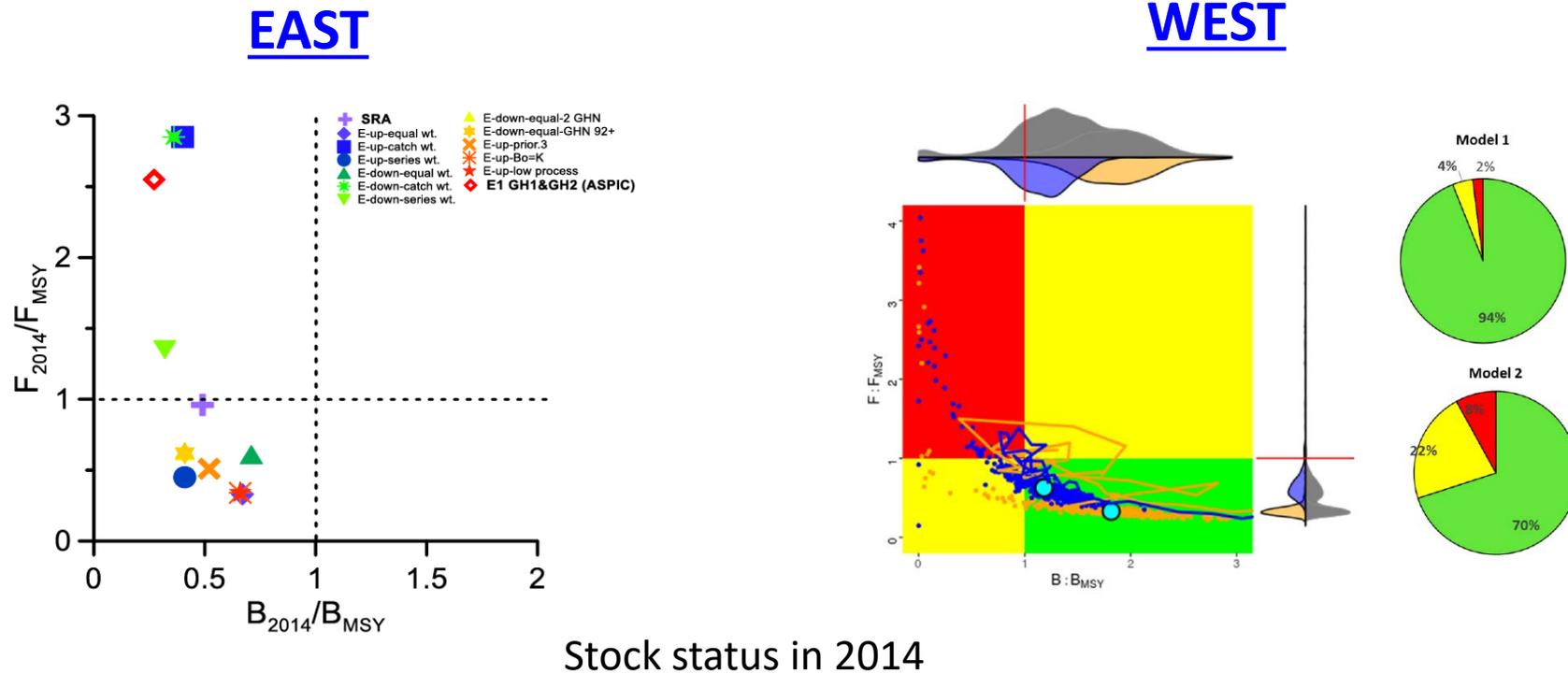


West stock:

- Catch (2018: **1519 t**; 2019: **1,361 t**; 2020; **1152 t**)
- TAC (2017-2020): 1,030 t



Sailfish stock status



- Last assessment in 2016 (estimates of stock status for 2014)
- **EAST**: all scenarios considered the **stock is overfished, but overfishing status is uncertain**
- **WEST**: both models indicated that the **stock is neither overfished nor experiencing overfishing**



- **ICCAT [Rec. 16-11]** establishes that **if the total catch harvested any year exceeds 67% of the estimated MSY (1,271 t in the EAST and 1,030 t in the WEST)**, the Commission shall review the recommendation and effectiveness of this.
 - **EAST Atl.:** Catches **exceeded total catch level in 2017 and 2019**, but not in 2018 and 2020.
 - **WEST Atl.:** Catches **exceeded total catch level in 2017, 2018, 2019 and 2020**.



21.14 Revise the statistical methodology used to estimate dead and live discards and provide feedback to CPCs, Rec. 19-05, para 16

- Only two CPCs have provided papers and information on the methods for estimating discards from ICCAT fisheries of bycatch species such as billfish (...). The Committee was supportive of the work done and further work is ongoing on some of the issues identified.
- (...) The Committee reminds CPCs which have not yet presented documentation on the bycatch estimation methodologies used and of their obligation to do so. Until the Committee can review the methodologies currently used by other CPCs, the Committee is not in a position to provide suggestions for any necessary improvements.
- With regards to artisanal fisheries, the Committee was informed that there are no discards as all billfish specimens are retained and landed. As such in those cases the landings represent the total catch.



21.15 Develop recommendations for Electronic Monitoring Systems, Rec. 19-05, para 20

- A Subgroup within the Billfishes Species Group was created to start addressing this issue.
- Noted that there are already minimum standards recommended by the Committee for Electronic Monitoring Systems (EMS) on purse seine fisheries (Ruiz et al., 2017).
- The Subgroup worked intersessionally during 2021, and at present the Committee does not yet have a final recommendation to provide to the Commission on the use of EMS for pelagic longline fisheries.
- The Subgroup will continue to work on this issue in later 2021 and during 2022, aiming to provide a more consolidated answer in 2022.
- The expanded Subgroup will also be available to review the scientific component of any standards provided intersessionally by IMM.



21.16 Explore potential technical changes to the terminal gear and fishing practices that could reduce bycatch and bycatch mortality (at-vessel and post-release). Design and implement a study(ies) to compare the effects of hook shape and size on catch rates. Rec. 19-05, para 21

- A Subgroup within the Billfishes SG was created to start addressing the issue related with experimental studies for longline technological gear changes.
- The Committee recognizes that a large number of scientific studies on the effects of terminal gear (e.g. hook size and type) and fishing practices on catch rates and survival of several bycatch and target species are already available. The Committee will allocate effort reviewing and summarizing these studies. This review will inform the Committee in its further work on these issues.
- The Subgroup worked intersessionally during 2021, and at present the Committee does not yet have a final recommendation to provide to the Commission on the planning of experimental field studies to address this issue.
- The Subgroup will continue to work on this issue in later 2021 and during 2022, aiming to provide a more consolidated answer to the SCRS in 2022.

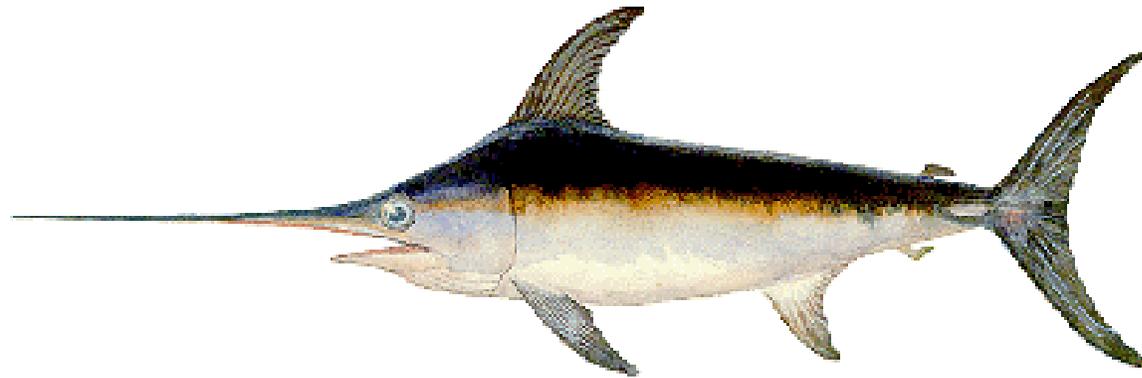


- **Enhanced Program for Billfish Research (EPBR)** – The highest priorities for 2022 are to support the objectives established by the billfish work plan and those of the EPBR, some that have been delayed due to covid-19:
 - Continue the growth study of the 3 priority billfish species in the eastern Atlantic;
 - Continue reproduction study of blue marlin in the Gulf of Mexico;
 - Technical workshops on age reading:
 - 2022: workshop to standardize ageing protocols and reading guidelines
 - 2023: workshop for building reference sets for spines and otoliths
- **Workshop on small scale fisheries (artisanal) in West Africa**, with the objective of collecting detailed information describing the fisheries and sampling programmes, aiming to improve the collection and submission of billfish data in these regions.

(Details of funding requests on Document STF-209)



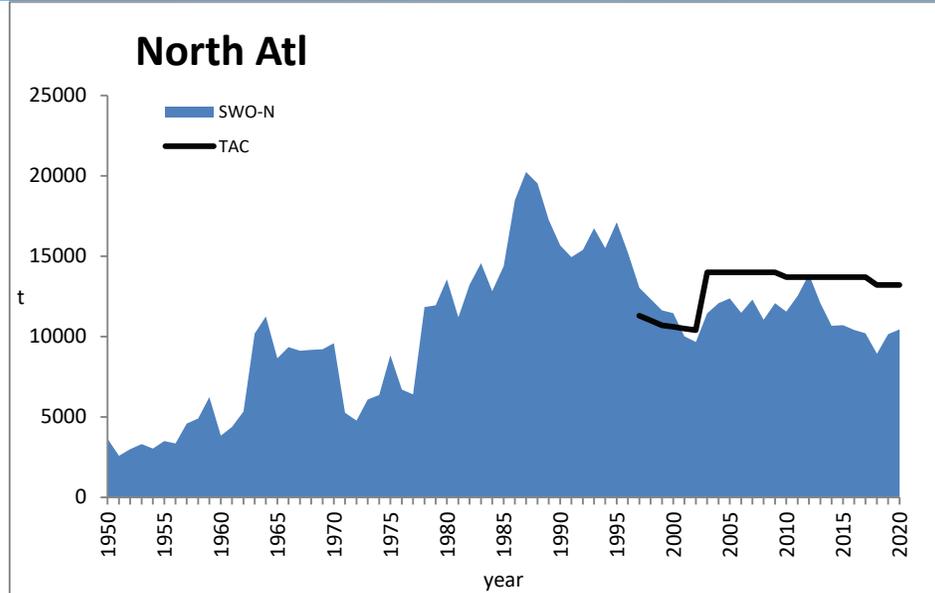
SWO - SWORDFISH



3 stocks
(North Atlantic, South Atlantic, Mediterranean)

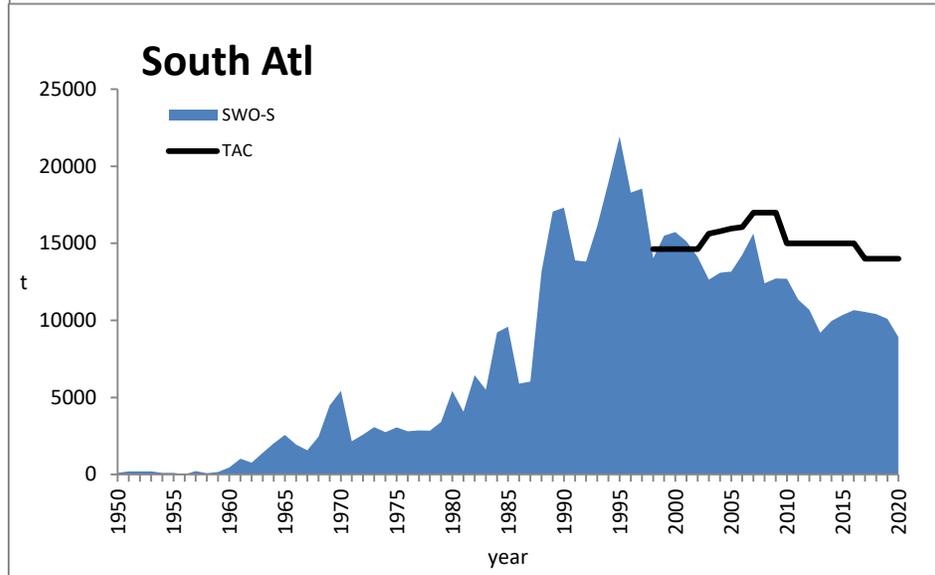


Atlantic Swordfish



North Atlantic:

- Catch (2020): 10,446 t
- TAC (2020): 13,200 t



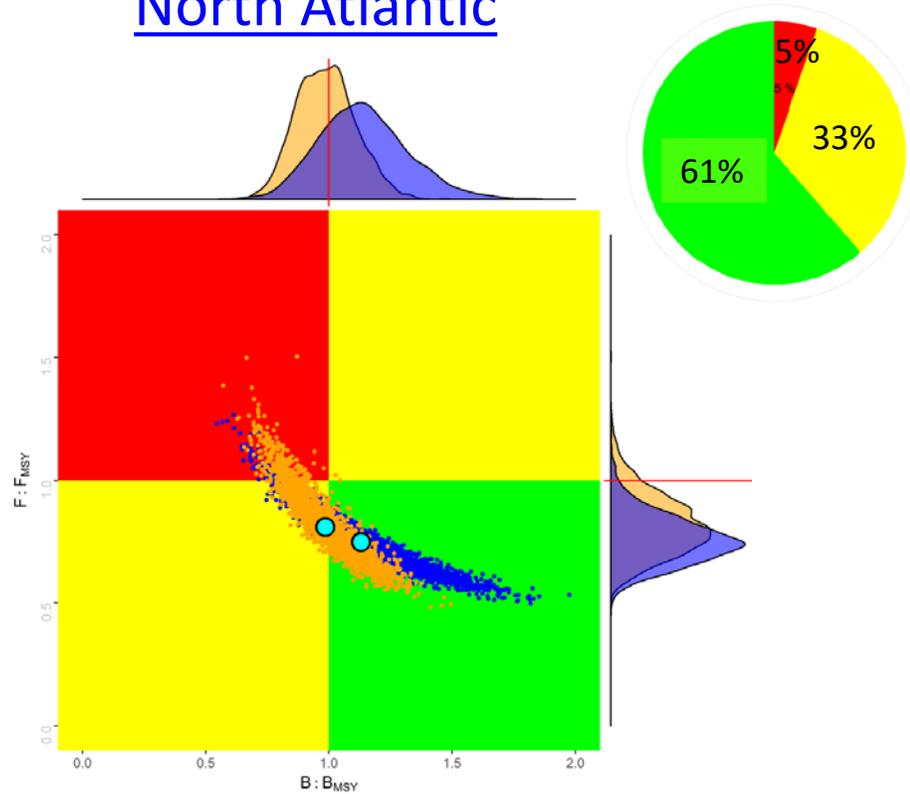
South Atlantic:

- Catch (2020): 8,933 t
- TAC (2020): 14,000 t



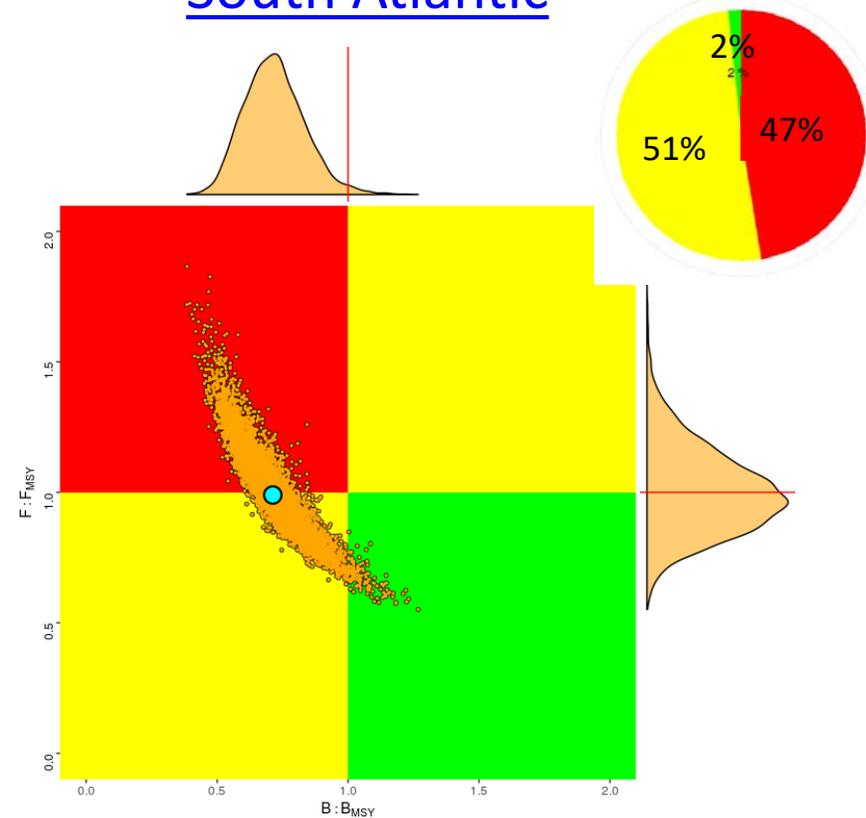
Kobe plots from 2017 assessment (data until 2015)

North Atlantic



- 61% probability that stock was at or above MSY reference levels

South Atlantic



- Stock biomass was overfished; overfishing was either occurring or very close to occurring.



Progress on N-SWO MSE

Year	Key events
✓ 2018	Process initiated; initial OM uncertainty grid generated
✓ 2019	OM development; technical expert develops initial MSE framework; conceptual management objectives adopted (Res 19-14)
✓ 2020	OM development; early cMP development
➔ 2021	OM grid revisions (reduce grid redundancy; account for discard mortality); cMP development; candidate performance indicators; MSE code review from external expert; candidate advice intervals
2022	Stock assessment; OM reconditioning; cMP development. Dialogue with PA4 on cMPs, operational management objectives and performance indicators
2023	Continue MSE with feedback from PA4. Commission to review cMPs and adopt an MP at the Annual Meeting, including TAC. Exceptional circumstances protocol to be adopted following PA2/ALB protocol
2024+	MP to be run on predetermined timescale

(Details of the MSE roadmap in PLE-113)



Dialogue with PA4

- July 2021: PA4 presented with informational update to NSW0 MSE:
 - Grid overview
 - Considerations on performance metrics
 - Candidate advice intervals
 - Exceptional circumstances protocol

- Request PA4 discuss and provide further guidance on:
 - Performance metrics
 - Advice intervals

11 Performance Metrics

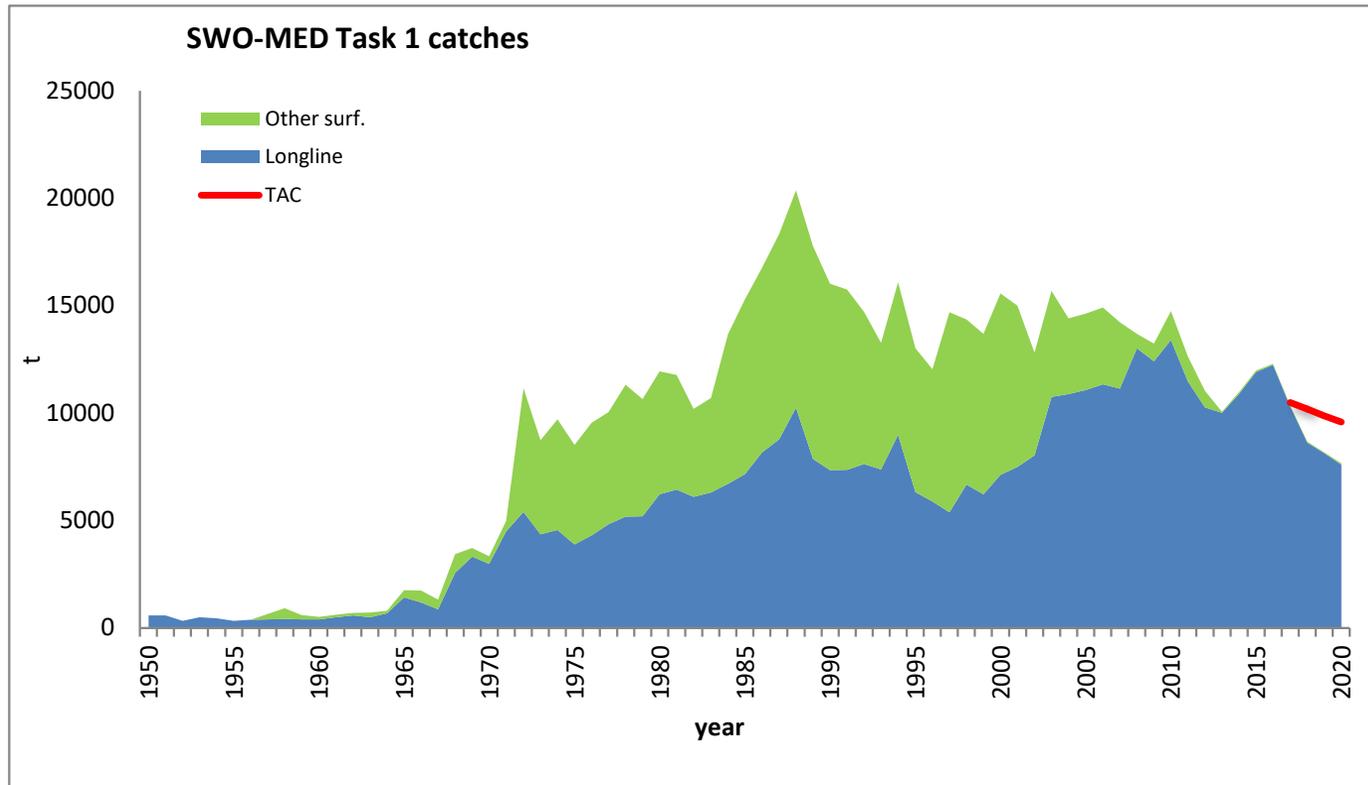
Based on feedback from the Commission’s Panel 4, the following performance metrics have been proposed for swordfish:

Name	Description	Statistic	Time Period (Years)	Minimum Acceptable Probability	Notes
Safety - Short	Maintain low probability of stock declining to unacceptably low level	Prob. $SB < SB_{lim}$	1 - 10	5 - 10%	SB_{lim} defined as $0.4 SB_{MSY}$
Safety - Medium	As above	As above	11 - 30	5 - 10%	
Status - Short	Maintain stock in green quadrant of the Kobe matrix	Prob $SB > SB_{MSY}$ & $F < F_{MSY}$	1 - 10	50 - 60%	
Status - Medium	As above	As above	11 - 30	50 - 60%	
Stability	Minimize large inter-annual changes in yield	Average annual variability in yield (AAVY)	1 - 30	Maximum AAVY of 15 - 25%	
Short-term Yield	Maximize yield while meeting other objectives	Average catch	1 - 10	-	
Long-term Yield	As above	As above	11 - 30	-	



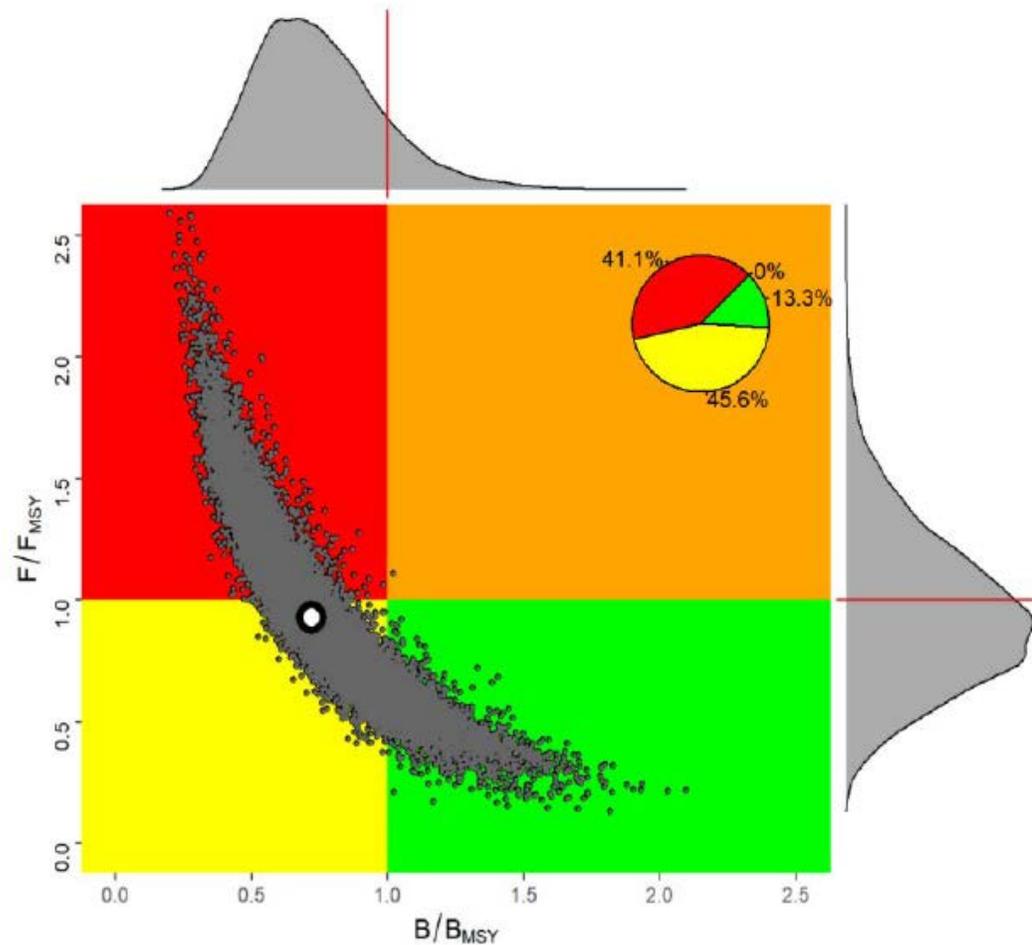
Mediterranean Swordfish

Catch (2020): 7,604 t
TAC (2020): 9,583 t





Kobe plots from the 2020 assessment



- Stock status from the 2020 assessment (data until 2018).
- The assessment indicated that **the stock was most likely overfished and current fishing mortality just below Fmsy levels**



21.12 SCRS advice on conservation and management measures for N-Atl swordfish, Rec. 17-02, para 5

Background: The Commission shall establish at its 2021 meeting conservation and management measures for North Atlantic swordfish on the basis of the SCRS advice resulting from the latest stock assessment as well as the Resolution by ICCAT on Criteria for the Allocation of Fishing Possibilities [Res. 15-13]...

Since the **stock assessment did not take place in 2021** as originally planned by the SCRS, **the Committee is not in a position to provide the requested response to the Commission.**

21.13 Interim limit reference (LRP) of $0.4 * BMSY$ or any more robust LRP established through further analysis, Rec. 17-03, para 12

*Background: When assessing stock status and providing management recommendations to the Commission in 2021, the SCRS shall consider the interim limit reference (LRP) of $0.4 * BMSY$ or any more robust LRP established through further analysis.*

Since the **stock assessment did not take place in 2021** as originally planned by the SCRS, **the Committee is not in a position to provide the requested response to the Commission.**



Applied to all stocks (Atlantic and Mediterranean)

- **Swordfish Year Programme (SWOYP):** Biology and stock structure study . the Committee recommends as high priority to continue biological studies on swordfish (*this recommendation applies to both the North and South Atlantic and Mediterranean stocks*).
 - Satellite tagging: continue deployment of satellite tags
 - Reproduction: continue analysis gonads
 - Age and growth: finish processing spines/otoliths, and start an age validation bomb-radiocarbon study
 - Genetics: continue population analysis of tissue samples for stock differentiation, and a pilot study on epigenetic ageing
 - Workshops: Workshop on the reference set for age and growth

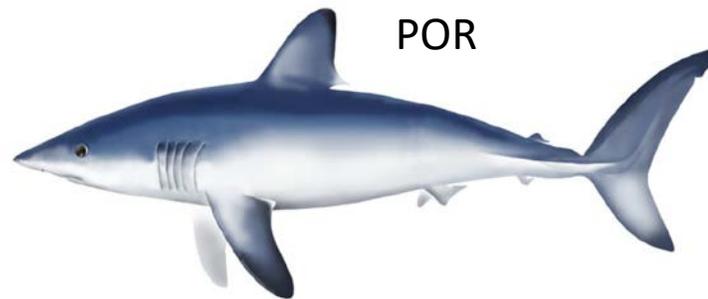
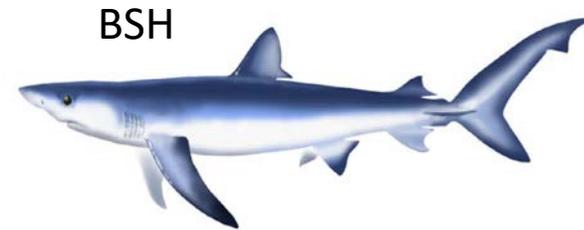
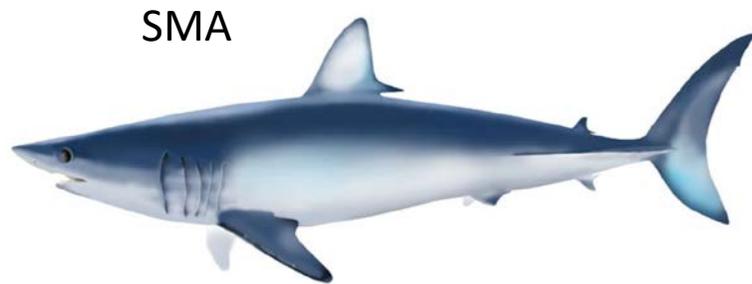
Specific for the North Atlantic

- **Continuing MSE for N-SWO:** Work started in 2018, and the SCRS recommends funding for continuing the swordfish MSE work for 2022-2023.

(Details of funding requests on Document STF-209)



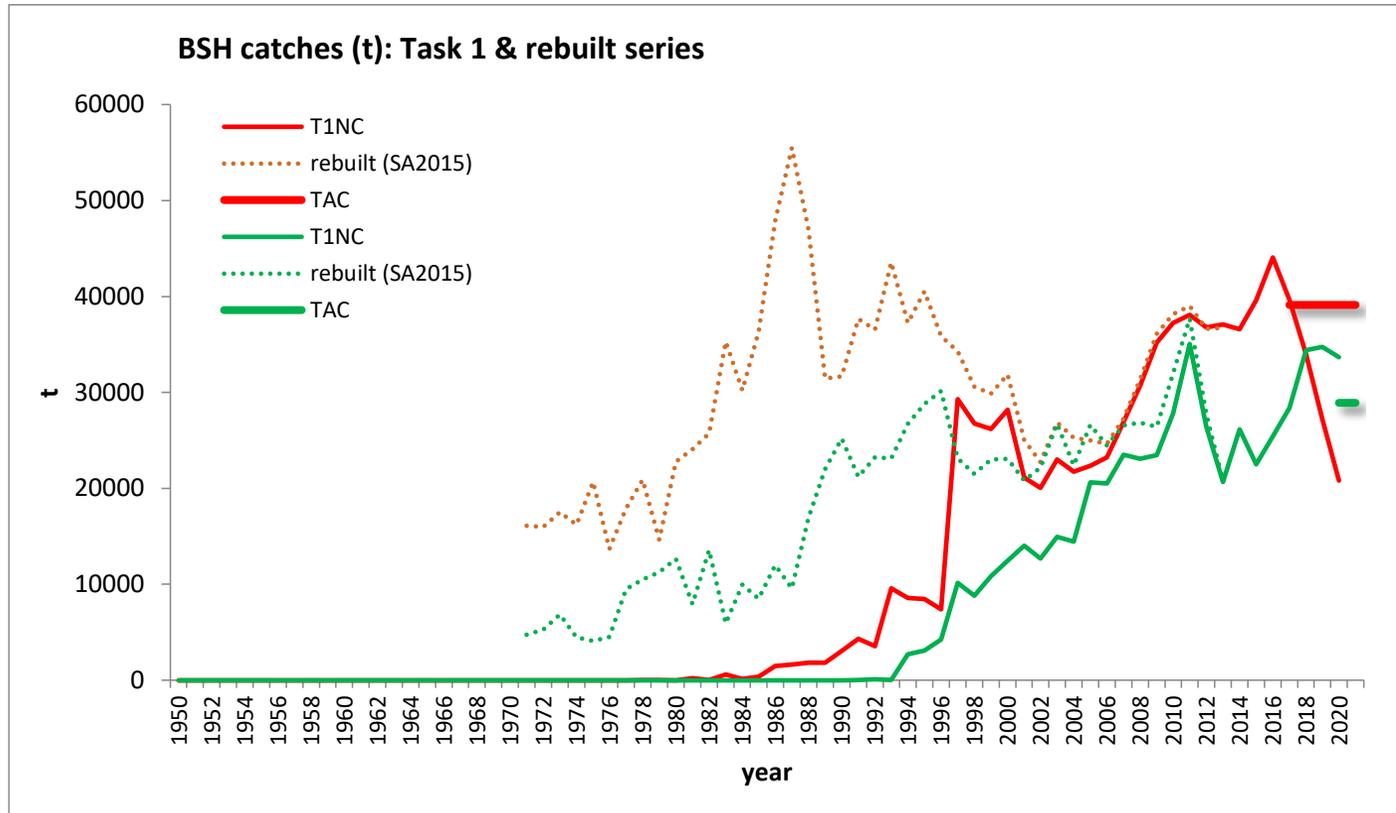
SHK - SHARKS



...and 21 more species (sharks and rays)



Blue shark catch statistics



BSH - North

Catch (2018-20): 33,995 t; 27,207 t; 20,827 t
 TAC (2018-20): 39,102 t

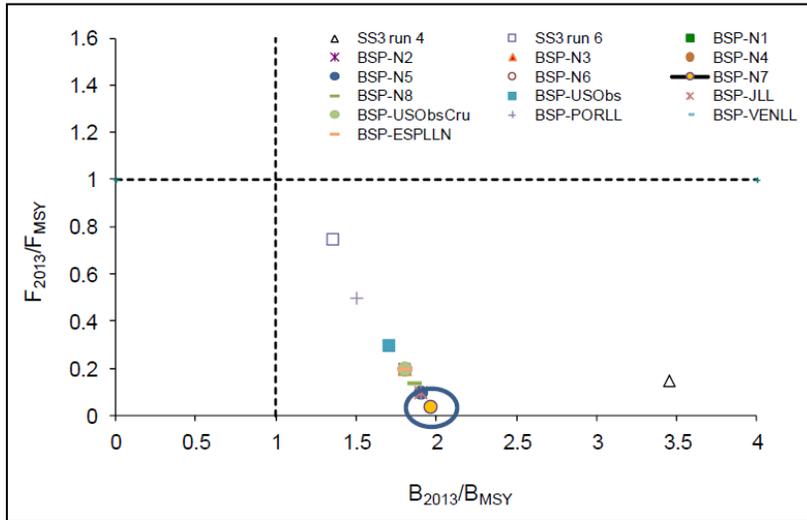
BSH - South

Catch (2018-20): 34,383 t; 34,734 t; **33,652 t**
 TAC (2020): 28,923 t



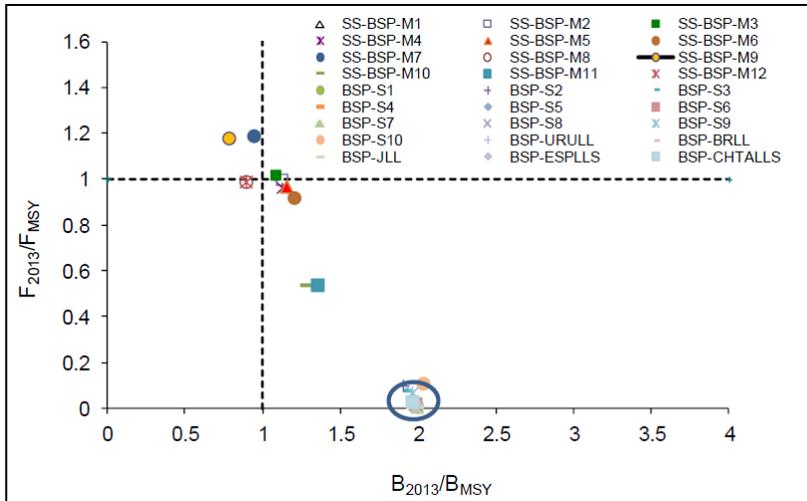
Blue shark stock status (assessed in 2015, data until 2013)

North Atlantic



- **North:** All scenarios indicated that the stock was **not overfished** and that **overfishing was not occurring**

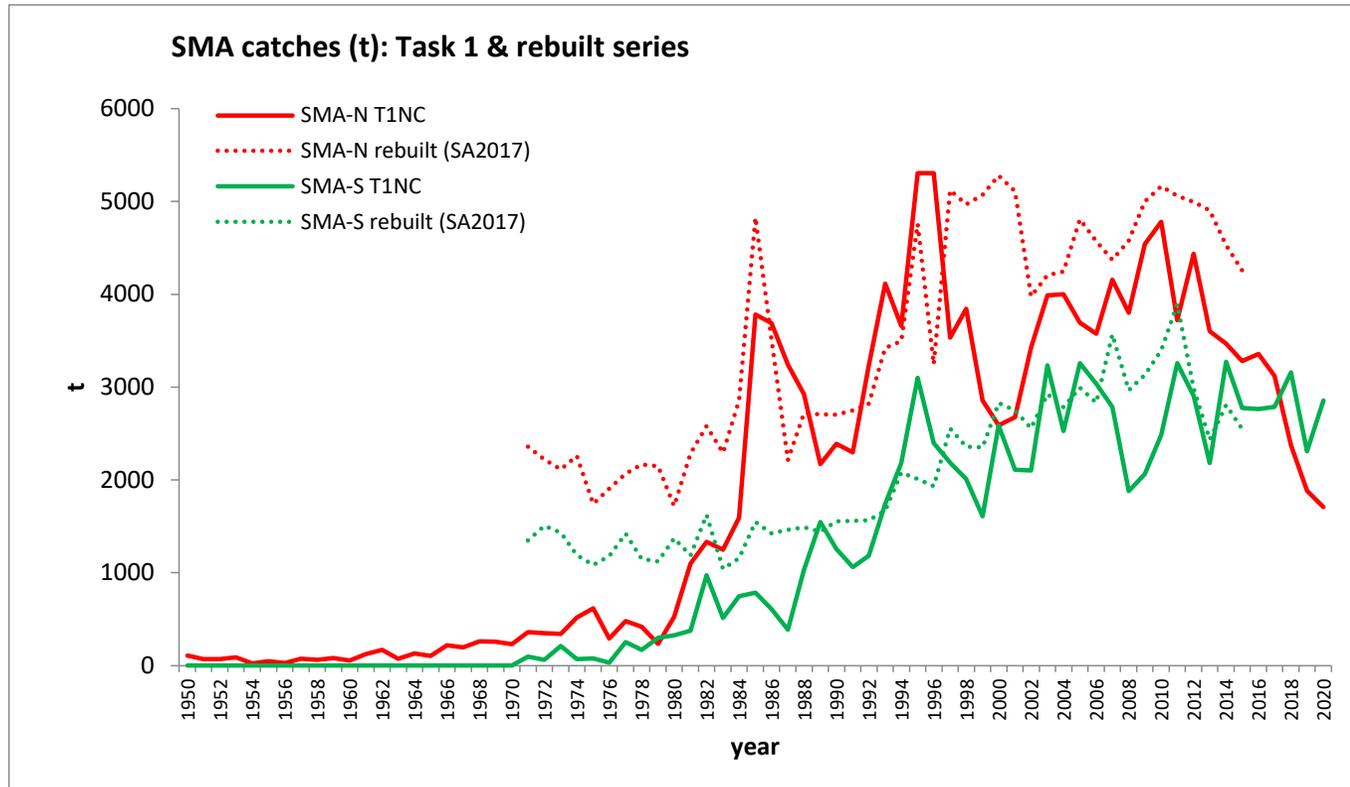
South Atlantic



- **South:** The stock **could be overfished** and **overfishing could be occurring**



Shortfin mako catch statistics



SMA - North

Catch (2018-20): 2373 t, 1882 t, 1709 t

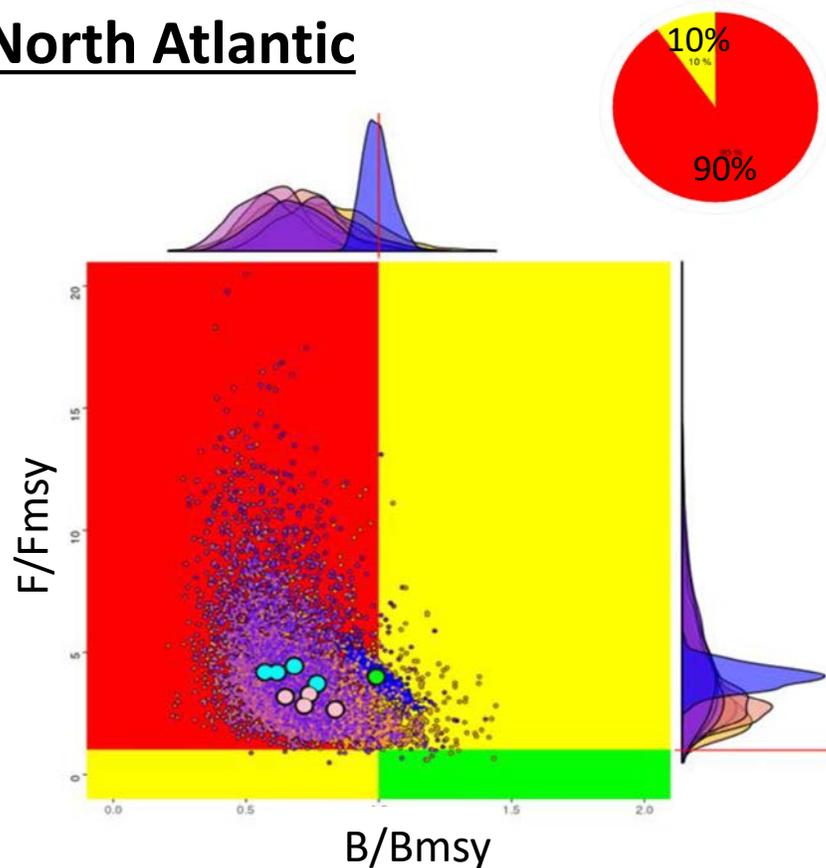
SMA - South

Catch (2018-20): 3158 t, 2308 t, 2855 t



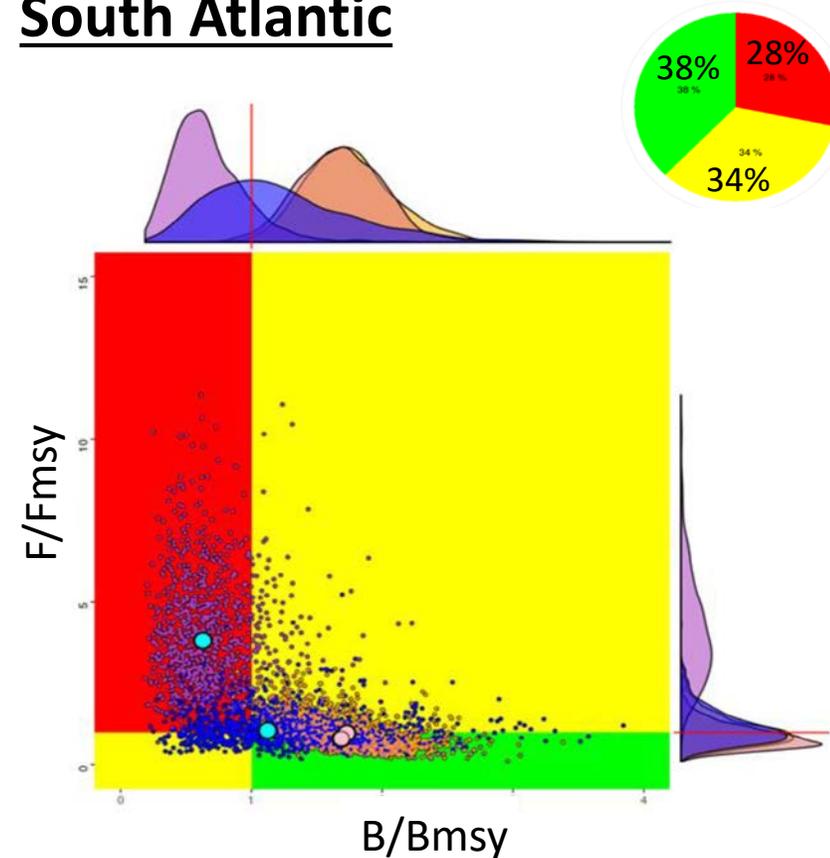
SMA 2017 stock status (data until 2015)

North Atlantic



- Stock abundance was below B_{msy} and fishing mortality above F_{msy} (90% probability).

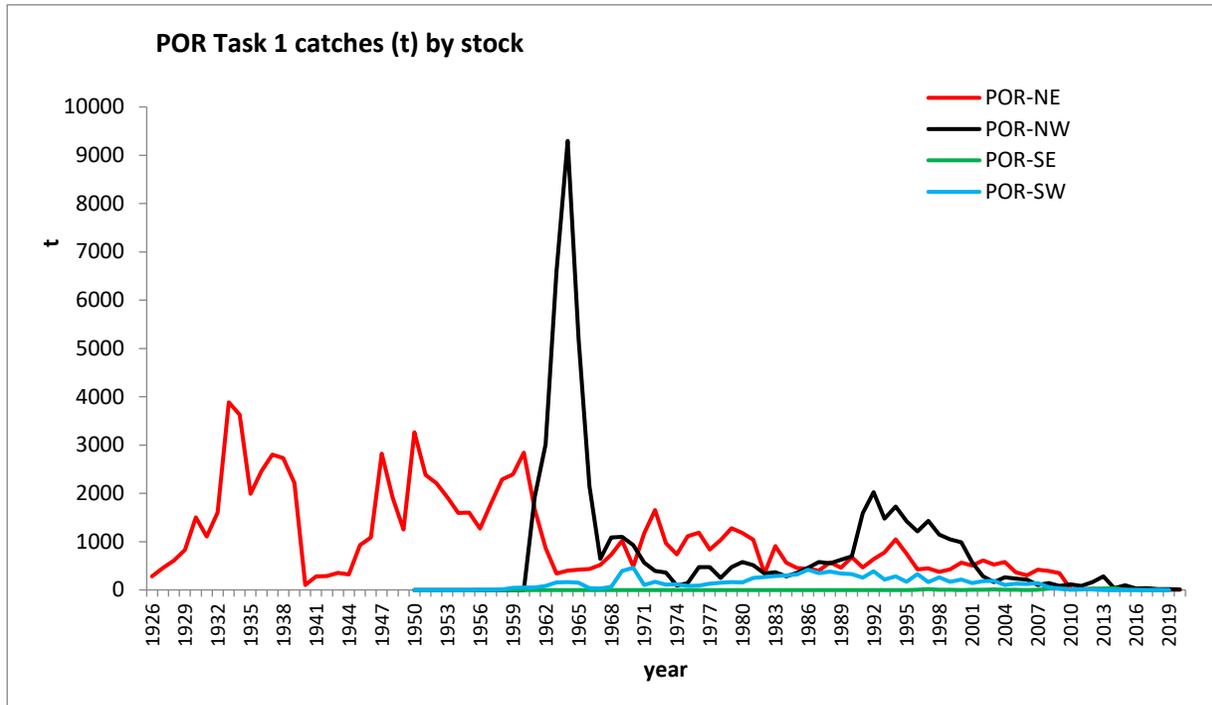
South Atlantic



- Combined probability of the stock being overfished was 32.5% and that of experiencing overfishing was 41.9%



Porbeagle shark catches



Catch (2020)

- NE Atl: 3 t
- NW Atl: 11 t
- SE Atl: 0 t
- SW Atl: 0 t

General notes on shark statistics:

- Global statistics on shark have improved;
- ... but are still insufficient to provide quantitative advice on stock status for most stocks (except BSH, SMA and POR).



Porbeagle 2020 stock status (data until 2018)

- NW Atlantic porbeagle stock (conducted in 2020)
 - The stock was **predicted to be overfished in 2018 with > 70% prob.**, even though **abundance has been increasing since 2001.**
 - **If removals remain similar to 2014-2018 (mean = 47 mt), the stock is predicted to rebuild with at least a 50% probability between 2030 and 2035**
- NE Atlantic was not carried out in 2020 (possibility of a joint ICCAT/ICES assessment)
- Due to lack of reporting, the magnitude of dead discards remains uncertain and post-release mortalities are not incorporated in this assessment, so there remains considerable uncertainty in the assessment of status.



Ecological Risk Assessment (last update in 2012)

Vulnerability rank for 20 stocks of pelagic sharks and rays: A lower rank indicates higher risk. Stocks listed in decreasing risk order according to the sum of the three indices. Red highlight indicates risks scores 1-5; yellow, 6-10; blue, 11-15; and green, 16-20.

Main results:

- Most vulnerable stocks: bigeye thresher, longfin and shortfin makos and porbeagle (Lamniformes sharks).
- Lowest vulnerabilities: scalloped hammerheads, smooth hammerhead and pelagic stingray

Stock	V ₁	V ₂	V ₃
BTH	3	1	1
LMA	5	3	2
SMA	1	8	2
POR	2	7	4
CCS	11	4	5
FAL SA	12	5	6
CCP	15	2	6
OCS	4	13	8
FAL NA	8	11	8
ALV	9	14	11
BSH NA	6	19	10
DUS	17	6	12
SPK	14	10	13
BSH SA	7	20	14
TIG	10	16	15
PLS SA	18	9	16
SPL NA	16	12	16
SPZ	13	17	18
SPL SA	19	15	19
PLS NA	20	18	20



Shortfin mako

21.17 The SCRS should provide advice. Rec. 19-06, para 11

- The SCRS reviewed several research papers that were potentially relevant for the management of SMA. However, the Committee is unable to draw conclusions or provide additional advice at this time based on this research.
- The **Committee has no additional advice to that provided in 2019.**



North Atlantic blue shark

21.18 Updated TAC advice in 2021, or at an earlier stage if enough information is provided. Rec. 19-07, para 2)

21.19 Provide, if possible, options of HCR with the associated limit, target and threshold reference points for the management of this species in the ICCAT Convention area. Rec. 19-07, para 8

- Since the **stock assessment did not take place in 2021** as originally planned by the SCRS, the **Committee is not in a position to provide the requested response to the Commission.**



South Atlantic Blue shark

21.20 Update TAC advice in 2021. Rec. 19-08, para 2

21.21 Provide, if possible, options of HCR with the associated limit, target and threshold reference points for the management of blue shark in the ICCAT Convention area. Rec. 19-08, para 8

- Since the **stock assessment did not take place in 2021** as originally planned by the SCRS, **the Committee is not in a position to provide the requested response to the Commission.**
- The Committee noted that the **2020 catches (of 33, 652 t) exceeded by about 16% the Total Allowable Catch (TAC, of 28,923 t) for South Atlantic blue shark** outlined in Rec. 19-08 (para. 2).

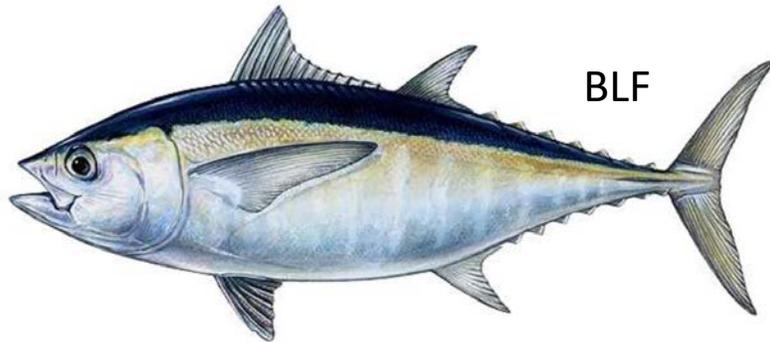


- **Provide funding for continuing the Shark Research and Data Collection Programme SRDCP:**
 - Complete work on South Atlantic shortfin mako age and growth;
 - Continue shortfin mako stock differentiation, and start stock differentiation for blue shark and porbeagle;
 - Continue work on movement and habitat characterization of silky, oceanic whitetip, longfin mako and hammerhead sharks through satellite tagging.

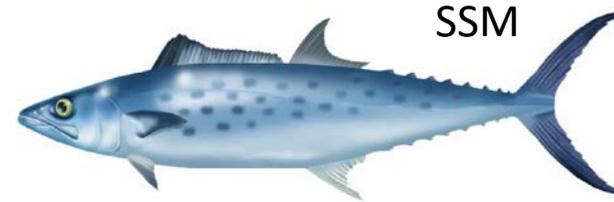
(Details of funding requests on Document STF-209)



SMT – SMALL TUNAS



BLF



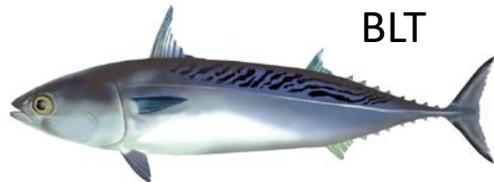
SSM



LTA



BON



BLT

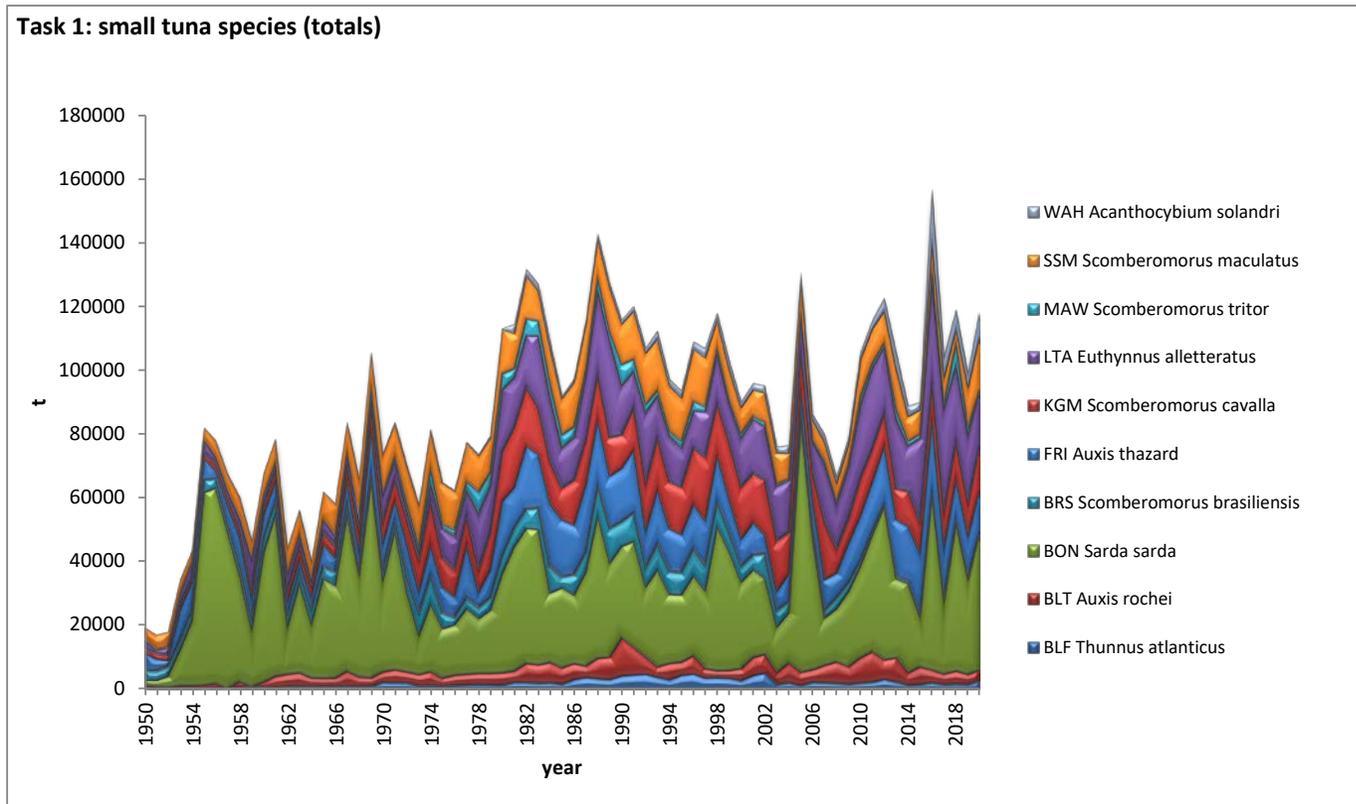


FRI

...and 7 more species



Small tunas catches



- Small tunas can reach high levels of catches and values in some years;
- High relevance from a social and economic point of view;
- Important for many coastal communities and a main source of food;
- Likely underestimation of total landings, due to the difficulties in data collection.



Status estimated in 2019 using data-limited approaches

		Data limited Assessments					
Last year assessed		Length based		LBSPR	Catch based		Catch+Length LIME
		LBSPR	LIME		DBSRA	SSS	
		Pons et al (2019a)		Baibat et al. (2019)	Pons et al. (2019b)		
		SPR	SPR		B/B _{MSY}	B/B _{MSY}	B/B _{MSY}
LTA_SE	2014-2016	0.13	0.27	--	0.69	0.94	1.83
BON_NE	2014-2016	0.23	0.71	0.34	1.63	1.98	2.02
WAH_NW	2014-2016	0.37	0.29	--	1.02	1.34	0.86
WAH_NE	2014-2016	0.55	0.38	--	--	--	--
BON_Med	2014-2016	0.59	0.22	--	--	--	--
LTA_Med	2014-2016	0.66	0.62	--	1.88	2.33	1.08
LTA_NW	2014-2016	0.66	0.48	--	--	--	--
FRI_SE	2014-2016	0.79	0.53	--	1.79	2.65	1.10
FRI_NE	2014-2016	0.83	0.46	--	1.64	2.50	1.29
LTA_NE	2014-2016	0.90	1.00	--	--	--	--

- State of some stocks **determined with a series of data-limited approaches.**
- In 2019 this was applied to 10 stocks: **LTA_SE and WAH_NW show some signs of overfishing, deserving special attention in the future.**



- **Continuing support to the SMTYP:** Continuing with the ICCAT SMTYP research programme activities in 2022-2024 to further improve the biological information (improving geographical coverage for growth, maturity and stock identification) for *Acanthocybium solandri* (WAH) and beginning new sampling studies for *Auxis thazard* (FRI) and *A. rochei* (BLT).
- **Regional workshop on the application of data-limited methods:** Recommend an in-person workshop be held to advance with the data limited models applied to some small tuna species.
- **New chapter for ICCAT Manual:** The Committee recommends that a new chapter of the ICCAT Manual be added, on the narrow-barred Spanish mackerel (*Scomberomorus commerson*).

(Details of funding requests on Document STF-209)



Thank You