

ICCAT SCRS Report ²⁰¹⁷

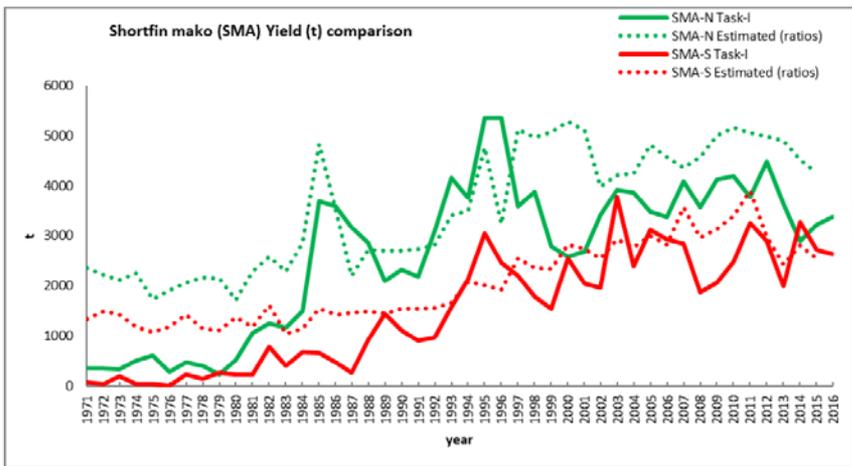
Panel 4-Swordfish, sharks, small tunas and billfish



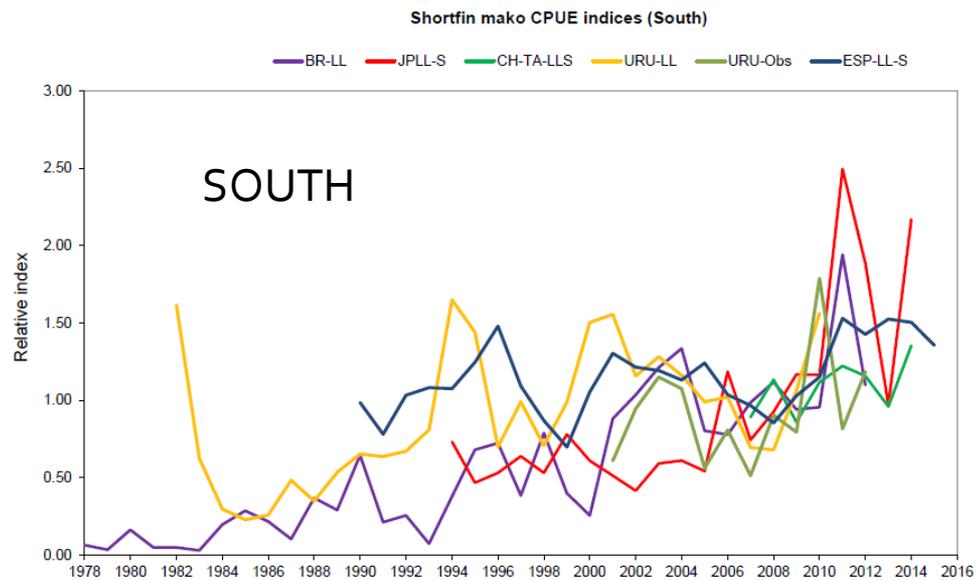
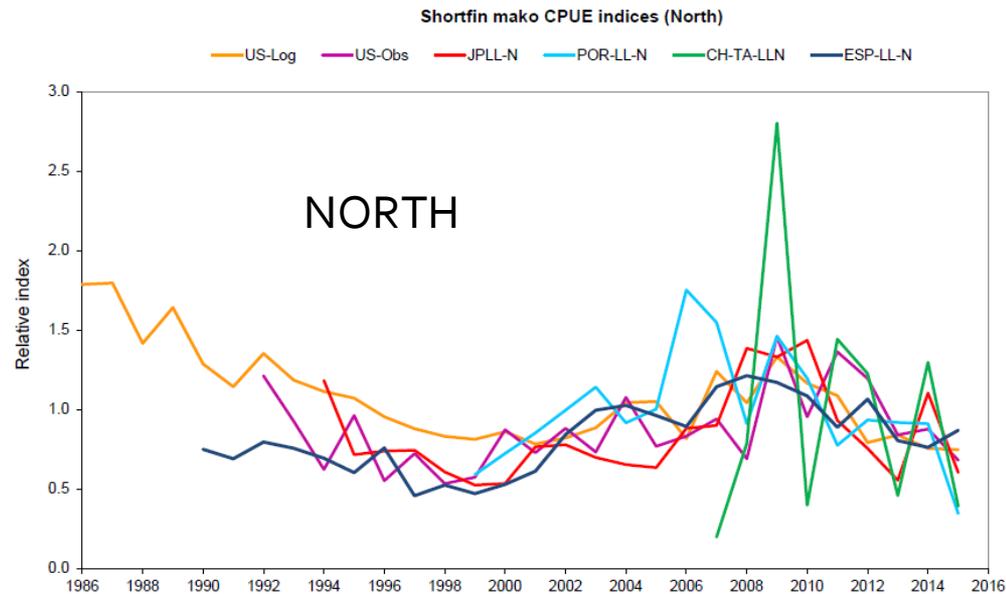


- Overview of stock status species not assessed in 2017
- Results of Shortfin 2017 mako assessment
- Results of Swordfish (north and south) assessment (including MSE)
- Responses to the commission

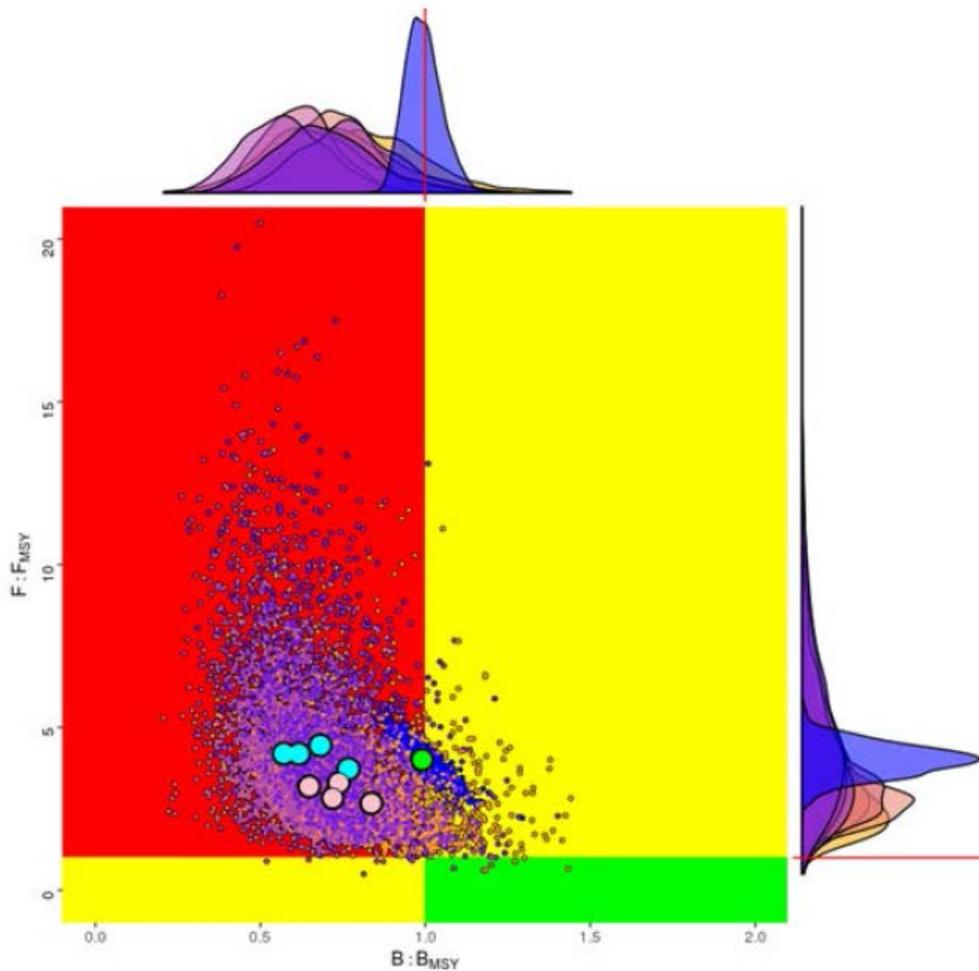
2017 Shortfin mako fishery indicators



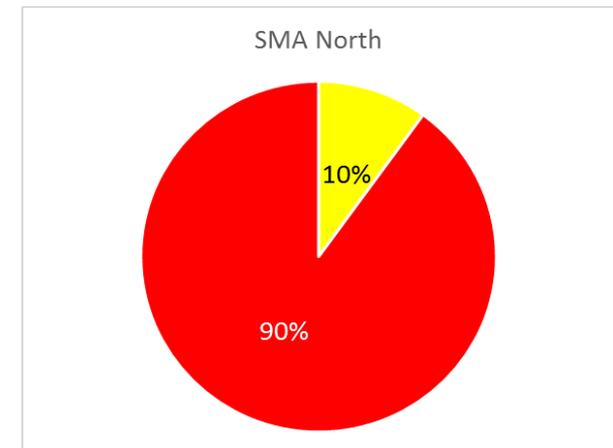
SHK-Figure 1. Blue shark (BSH) and shortfin mako (SMA) catches reported to ICCAT (Task I) and estimated by the Committee (2016 landings are considered provisional).



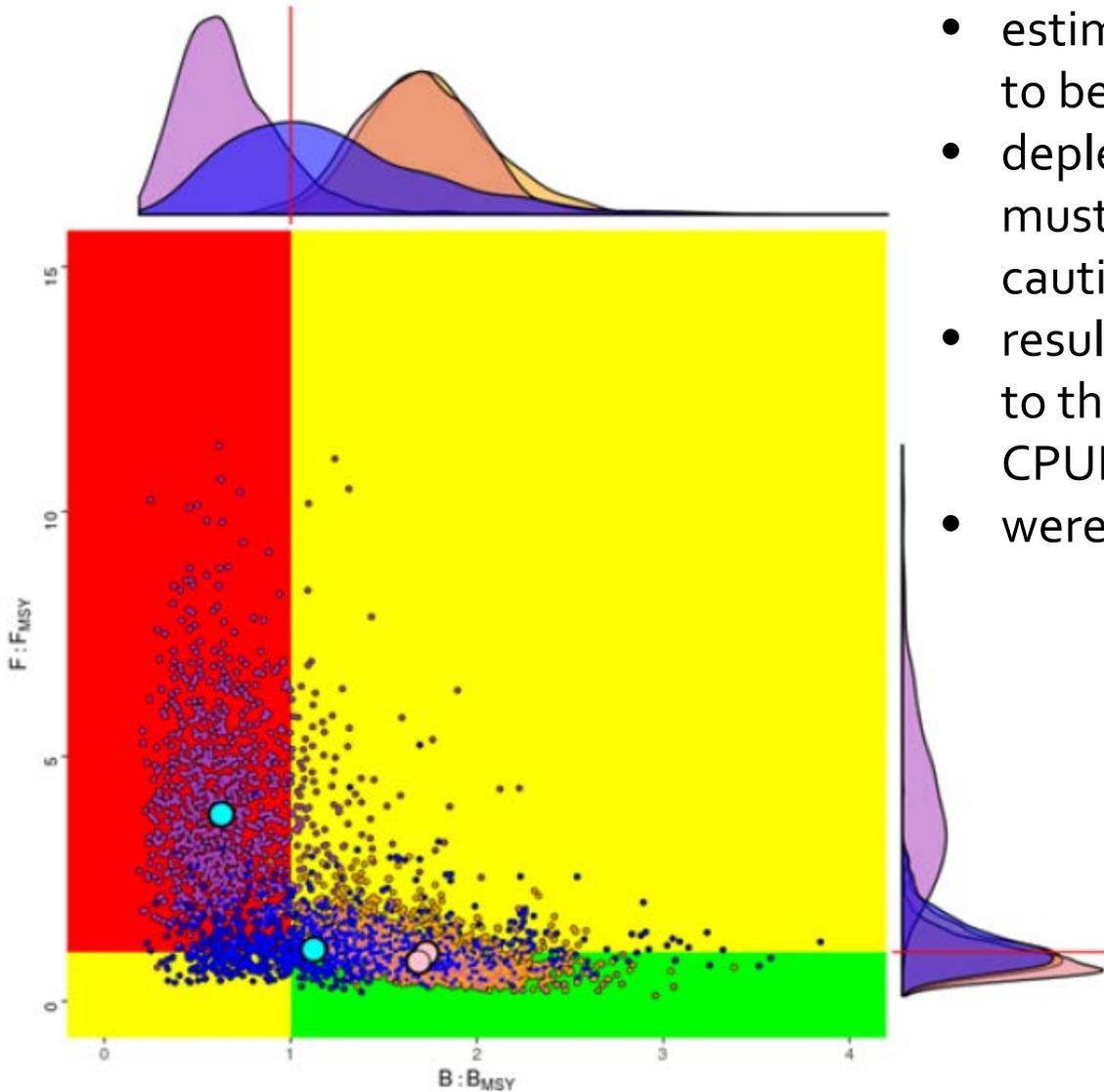
Shortfin mako North stock status



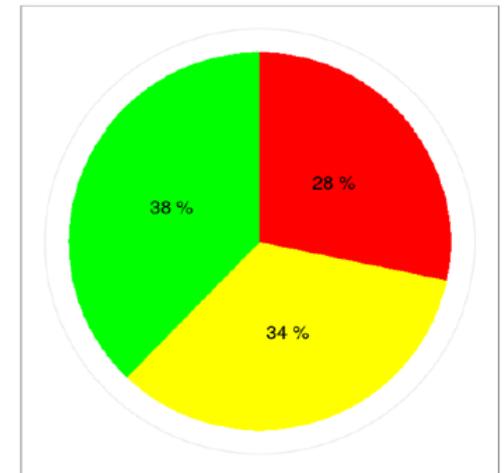
- all results indicated that stock abundance in 2015 was below B_{MSY}
- production models (were more pessimistic than those of the age-structured model
- F was overwhelmingly above F_{MSY}



Shortfin mako South stock status

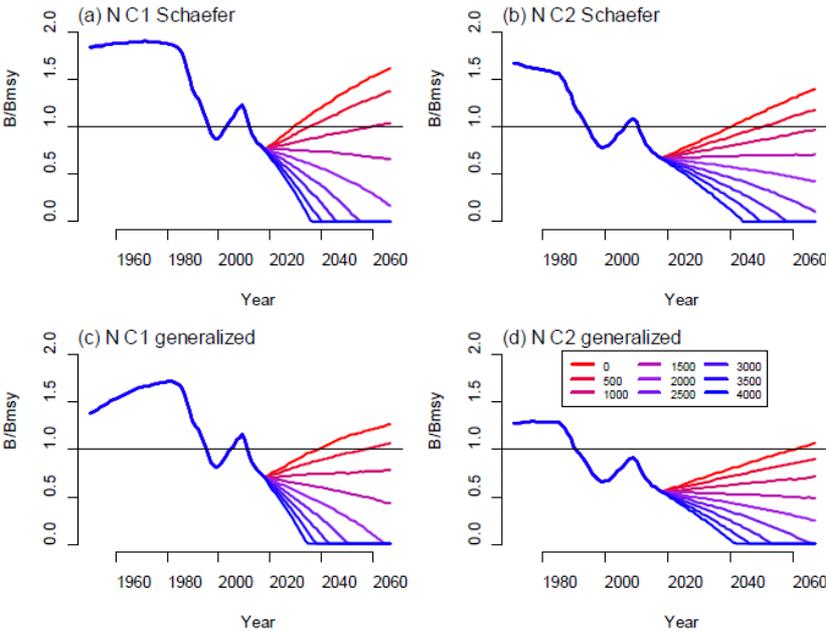


- estimates of harvest rates appear to be fairly robust
- depletion and B/B_{MSY} estimates must be treated with extreme caution.
- results are highly uncertain owing to the conflict between catch and CPUE data.
- were not able to do projections





Shortfin mako North outlook



- projections could only be carried out with the BSP2JAGS production model
- current catch levels (3,600 t for the Task I catches [C1] and 4,750 t for the alternative catches estimated based on ratios [C2], will cause continued population decline
- catches would need to be 1,000 t or lower to prevent further population declines

Probability of being in the green zone ($F < F_{MSY}$ and $B > B_{MSY}$)

Catch (t)	2018	2020	2022	2024	2026	2028	2030	2032	2034	2036	2038	2040
0	6	11	16	21	27	31	36	41	43	46	50	54
500	4	9	12	15	19	21	24	27	29	30	33	35
1000	5	8	9	11	15	15	19	20	21	23	23	25
1500	3	4	5	7	7	8	9	10	11	12	12	12
2000	0	2	2	3	3	3	3	4	4	4	5	5
2500	0	1	1	1	1	2	2	2	2	2	2	2
3000	0	0	0	0	0	0	0	0	0	0	0	0
3500	0	0	0	0	0	0	0	0	0	0	0	0
4000	0	0	0	0	0	0	0	0	0	0	0	0



Shortfin mako North management recommendations



- If the Commission wishes to stop overfishing immediately and achieve rebuilding by 2040 with over a 50% probability, the most effective immediate measure is a complete prohibition of retention.
- Additional recommended measures that can potentially further reduce incidental mortality include time/area closures, gear restrictions, and safe handling and best practices for the release of live specimens (since post release survival can reach 70%).
- there will be a need for CPCs to strengthen their monitoring and data collection efforts to monitor the future status of this stock, including but not limited to total estimated dead discards and the estimation of CPUE using observer data.

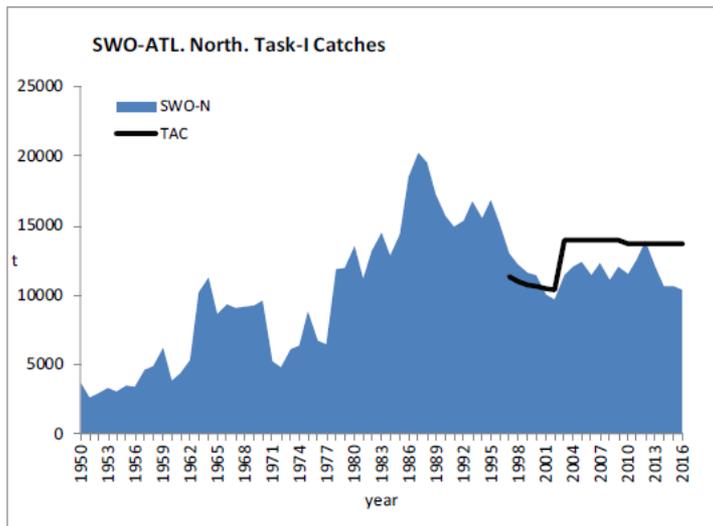


Shortfin mako South management recommendations



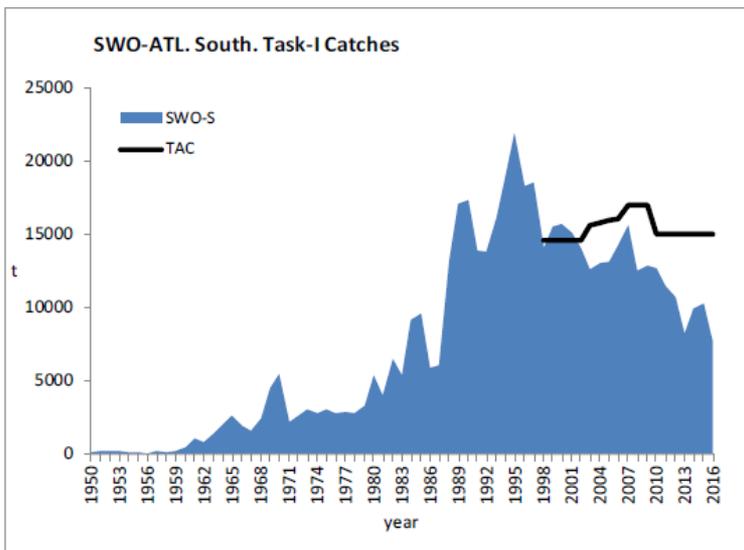
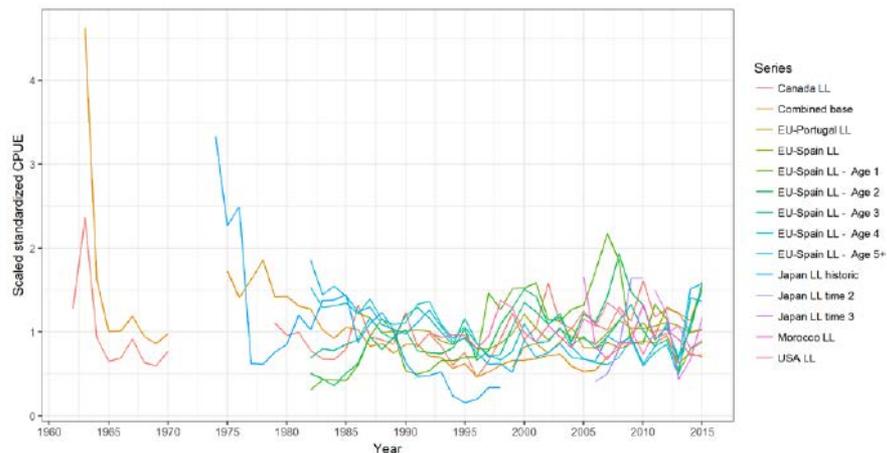
- given the uncertainty in stock status, the large fluctuations in catch, the high intrinsic vulnerability of this species, and the depleted status for the North Atlantic stock,
- the Committee recommends that until this uncertainty is reduced, catch levels should not exceed the minimum catch in the last five years of the assessment (2011-2015; 2,001 t with catch scenario C1).

2017 Swordfish fishery indicators

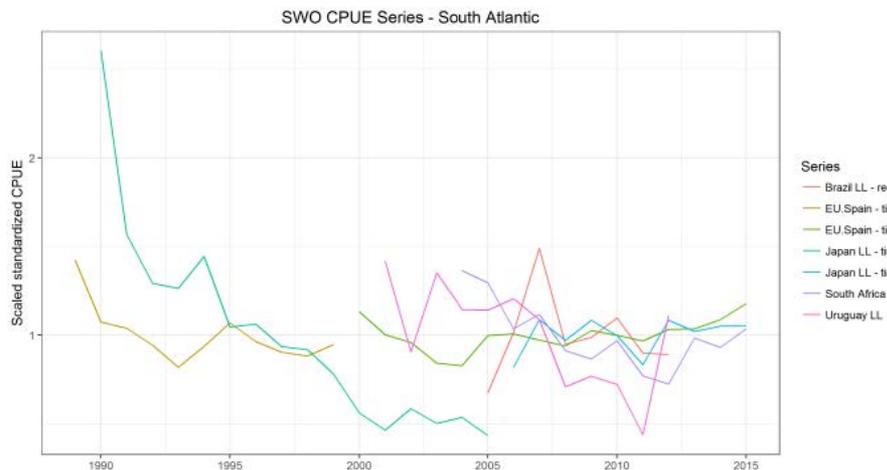


NORTH

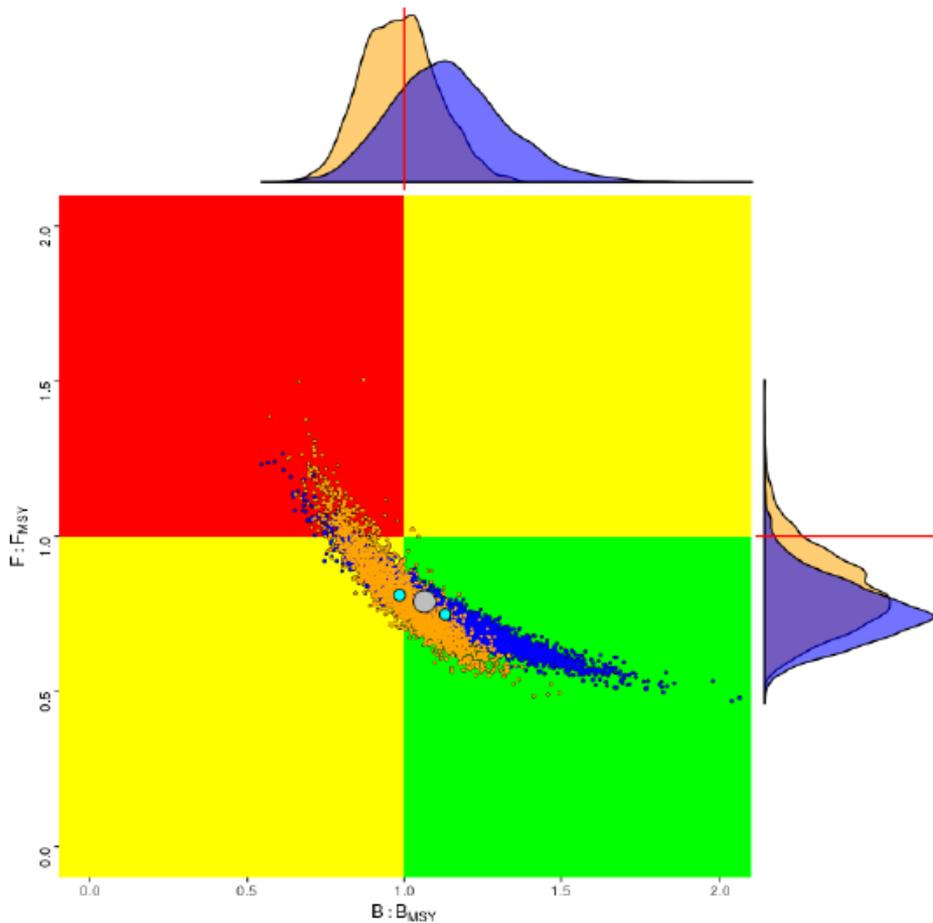
Relative abundance indices



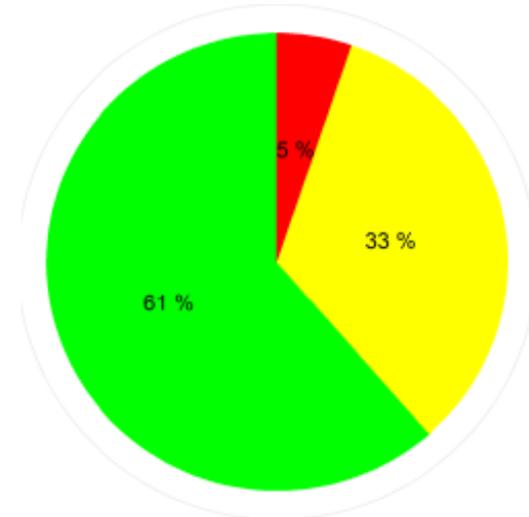
SOUTH



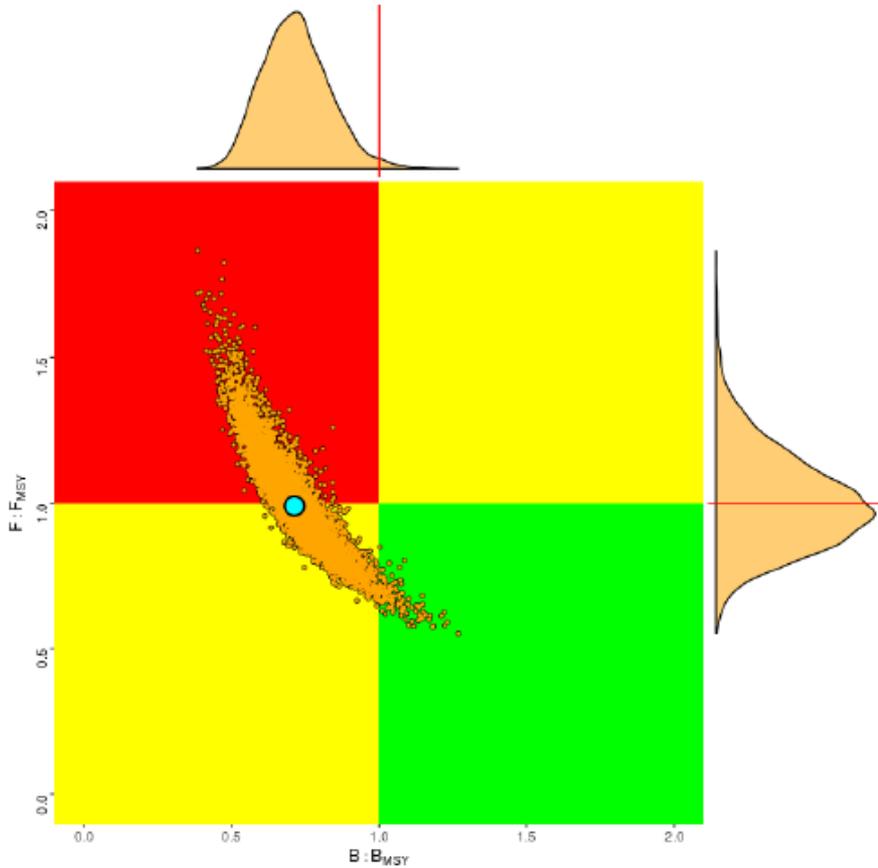
Swordfish North stock status



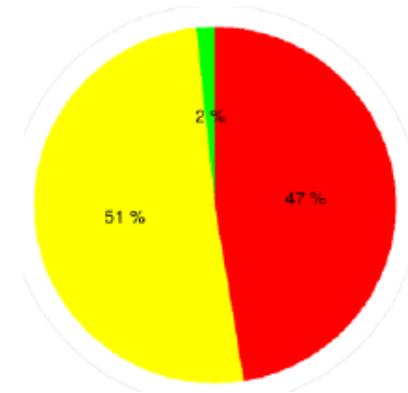
- significant improvement in the understanding of current stock status for North Atlantic swordfish using updated information and integration of the new data sources.
- stock status and projections, based on BSP2 and SS models.



Swordfish South stock status



- Both production models agreed that the southern swordfish stock biomass is overfished, and that overfishing is either occurring or current F is very close to F_{MSY} .
- Used only one model (JABBA) to provide advice





ATLANTIC SWORDFISH SUMMARY

	<i>North Atlantic</i>	<i>South Atlantic</i>
Maximum Sustainable Yield	13,059 (11,840-14,970) ¹	14,570 (12,962-16,123) ²
Current (2016) TAC	13,700 t	15,000 t
Current (2016) Yield ³	10,404 t	7,725 t
Yield in last year used in assessment (2015) ⁴	10,668 t	10,227 t
B _{MSY}	82,640 t (51,580-132,010) ⁵	52,465 t (35,119-80,951) ²
SSB _{MSY}	21,262 t (14,797-27,728) ⁶	Unknown
F _{MSY}	0.17 (0.10-0.27) ¹	0.28 (0.17-0.44) ²
Relative Biomass (B ₂₀₁₅ /B _{MSY})	1.04 (0.82 - 1.39) ⁷	0.72 (0.53 - 1.01) ⁸
Relative Fishing Mortality (F ₂₀₁₅ /F _{MSY})	0.78 (0.62-1.01) ⁷	0.98 (0.70 - 1.36) ⁸
Stock Status (2015)	Overfished: NO	Overfished: YES
	Overfishing: NO	Overfishing: NO

Swordfish North outlook



Given the current status of the stock being quite close to the MSY benchmarks, values of catches around 13,000 t are also projected to maintain biomass above B_{MSY} during the projected time frame.

probabilities (%) that both the fishing mortality is below F^{MSY} and biomass is above B^{MSY}

TAC	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028
12000	73	73	75	74	76	76	77	77	77	78	77
12200	72	72	72	73	74	74	74	74	74	74	74
12400	71	71	71	71	71	72	72	71	71	71	70
12500	71	70	70	70	70	70	70	70	69	69	68
12600	70	69	69	69	69	68	68	68	67	67	66
12700	69	68	68	68	67	66	66	66	65	64	64
12800	68	67	67	67	66	65	64	64	63	62	61
12900	67	66	65	65	64	63	62	62	60	59	59
13000	66	65	64	63	62	61	60	59	58	57	56
13100	66	64	62	62	60	59	57	57	56	55	53
13200	64	63	61	60	58	57	55	54	53	52	50
13300	64	62	60	58	56	54	53	51	50	49	48
13400	62	61	58	57	55	52	50	49	47	46	45
13500	61	59	57	55	53	50	48	46	45	43	42
13600	60	57	55	53	51	48	46	44	43	41	39
13700	59	56	54	51	49	46	44	42	40	38	36
13800	57	54	52	49	47	44	42	40	37	36	34
14000	54	51	48	46	43	40	37	35	33	31	29

Swordfish South outlook



probabilities (%) that both the fishing mortality is below F^{MSY} and biomass is above B^{MSY}

Committee notes that catches should be reduced to a level at or below 14,000 tons to rebuild the population to biomass levels that can produce MSY by the end of the projection period in 2028

TAC	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028
10000	35	51	65	75	81	85	88	90	92	93	95
10500	35	51	63	72	78	82	86	88	90	91	92
11000	35	49	59	67	74	79	82	85	87	88	90
11500	36	47	57	64	70	75	78	81	83	85	86
12000	36	46	54	60	66	70	74	77	79	81	83
12500	36	44	51	56	60	65	68	71	73	75	76
13000	36	42	47	52	56	59	62	65	66	68	70
13200	36	41	45	50	53	57	59	61	63	65	65
13400	35	40	45	49	51	54	56	58	59	61	62
13600	35	39	43	46	49	51	52	55	56	57	58
13700	35	39	42	45	47	50	52	53	54	56	57
13800	35	38	41	44	46	48	50	51	53	53	54
13900	34	37	40	43	45	46	48	49	50	52	52
14000	35	37	40	42	44	46	47	48	48	49	50
14500	33	34	35	36	36	37	38	38	38	38	39
15000	30	30	30	29	29	28	28	28	27	27	26
15500	26	25	23	22	20	19	18	17	16	16	15
16000	22	19	17	15	13	12	11	9	8	8	7



Swordfish North management recommendations



- The current TAC of 13,700 t has a 36% probability of maintaining the North Atlantic swordfish stock in the green quadrant of the Kobe plot by 2028, whereas a TAC of 13,200 t would have a 50% probability, and would also result in the biomass being above BMSY with a probability greater than 50%, consistent with Rec. 16-03
- the advice does not account for removals associated with the actual mortality of unreported dead and live discards, quota carryovers (15% in the North Atlantic), quota transfers across the North and South stock management boundaries nor the total cumulative quota, which includes that allocated to "other CPCs" and would fall above the TAC if achieved. The Committee emphasizes the importance of this uncertainty particularly given that the current estimated biomass is close to BMSY.



Swordfish South management recommendations



- The current TAC of 15,000 t has a 26% probability of rebuilding the South Atlantic swordfish stock to within MSY reference levels by 2028, whereas a TAC of 14,000 t would have a 50% probability of rebuilding the stock.
- The Committee also recognizes that the above advice does not account for removals associated with the actual mortality of unreported dead and live discards, quota carryovers (30% in the South Atlantic) nor quota transfers across the North and South stock management boundaries. The Committee emphasizes the importance of this uncertainty particularly given that the current estimated biomass is lower than BMSY.

Overall Report card of Panel 4 stocks

			Probabilities from Kobe plot				
			0	25	50	75	100
		Last SA					
SWO	N	2017	[Green bar from 0 to ~65, Yellow bar from ~65 to ~90, Red bar from ~90 to 100]				
SWO	S	2017	[Yellow bar from 0 to ~50, Red bar from ~50 to 100]				
SWO	M	2016	[Red bar from 0 to 100]				
BUM		2011	[Red bar from 0 to 100]				
WHM		2012	[Yellow bar from 0 to ~60, Red bar from ~60 to 100]				
SAI	E	2016	Not quantified				
SAI	W	2016	[Green bar from 0 to ~75, Yellow bar from ~75 to ~90, Red bar from ~90 to 100]				
BSH	N	2015	Not quantified				
BSH	S	2015	Not quantified				
SMA	N	2017	[Yellow bar from 0 to ~10, Red bar from ~10 to 100]				
SMA	S	2017	[Green bar from 0 to ~35, Yellow bar from ~35 to ~65, Red bar from ~65 to 100]				
POB	NE	2009	Not quantified				
POB	NW	2009	Not quantified				
POB	SW	2009	Not quantified				

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

ERA For other sharks

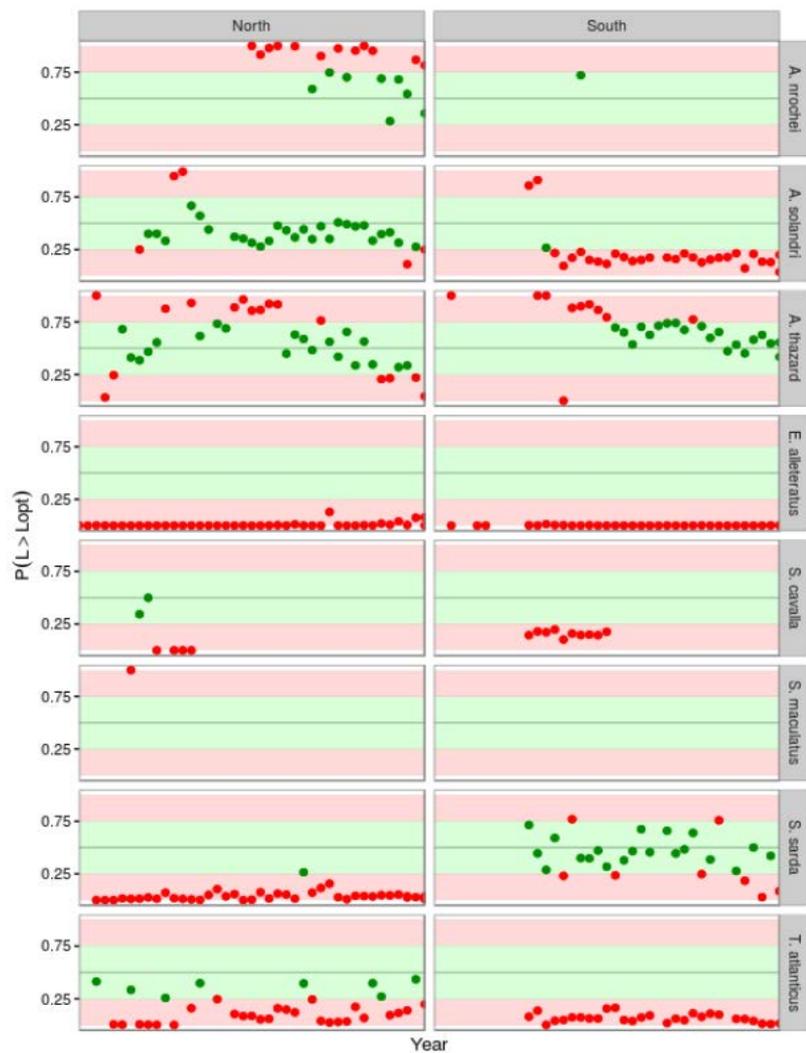


Small tunas

Indicator of target reference point

NORTH

SOUTH

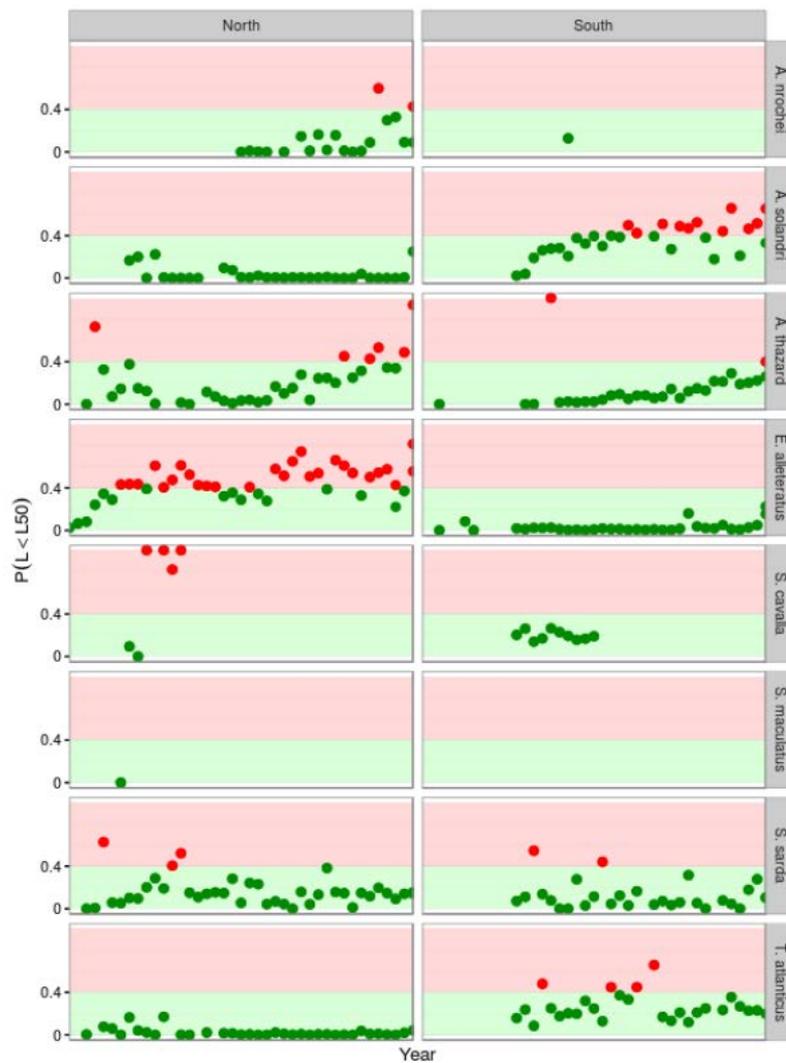


Indicator of limit reference point

NORTH

SOUTH

Proportion of Lengths < L50



Proportion of Lengths > Lopt

20.13 Provide the Commission with the confirmed average round weight and gilled and gutted weight, corresponding to the LJFL of 100 cm. Rec. 16-05, paragraph 16

Mediterranean SWO: mean weight estimates corresponding to 100cm LJFL, based on large integrated data sets from various Mediterranean areas (with 95% CL).

Weight type	Estimate (kg)
Gilled-Gutted (GG)	11.06 (9.86-12.37)
Gutted (GW)	11.68 (10.44-13.03)
Round (RW)	12.61 (11.24-14.10)

Length-weight relationships:

$$GG = 0.00000843 \times LJFL^{3.059}$$

$$GW = 0.00000645 \times LJFL^{3.129}$$

$$RW = 1.14 \times GG$$

Where, LJFL is the Lower-jaw fork length (cm); GG is the gilled and gutted weight; GW is the gutted weight; and RW is the round weight.

20.14 Continue to monitor and analyze the effects of the minimum size measure on the mortality of immature swordfish. Recs. 16-03, paragraph 10 and 16-04, paragraph 7

Since the implementation of the minimum landing sizes in 2000, the estimate of percentage of swordfish less than 125 cm LJFL reported landed (in number) has been generally decreasing in the North Atlantic and stable in the South.

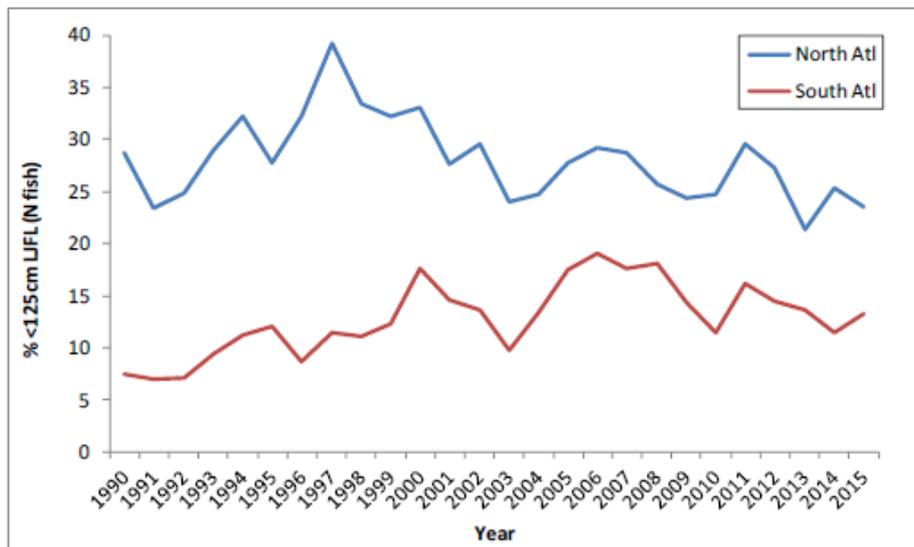


Figure 1. Trends of the % of the swordfish catch (in number of fish) estimated to be smaller than 125 cm LJFL, between 1990 and 2015 for the North and South Atlantic swordfish stocks. Data from the swordfish catch-at-size estimations.

hooking mortality is very high, in particular for small swordfish. Specifically, for some surface longline gears, the estimates of hooking mortality for specimens <125 cm LJFL ranged between 78-88%, with the post-release mortality of specimens discarded alive unknown.

20.15 Develop a new data collection initiative as part of the ICCAT Enhanced Program for Billfish Research to overcome the data gap issues. Rec. 15-05, paragraph 10 and Rec. 16-11, paragraph 3

- Only two CPCs have consistently reported dead and live discards for all major billfish species throughout the time period revised (2006-2015).
- The Committee cannot determine the feasibility of estimating fishing mortality by commercial, recreational, and artisanal fisheries.
- If more complete data on discards is provided before the 2018 Data preparatory meeting, the upcoming 2018 blue marlin assessment may provide a better insight in the estimation of fishing mortality by gear from discards.
- A comprehensive study of strategic investments related to artisanal fisheries data collection in ICCAT Fisheries in the Caribbean Region is a necessary next step to respond to the Commission's desire to overcome data gaps in fisheries catching billfish, particularly those from artisanal fisheries, and improve future stock assessments and the quality of management advice to be provided.

20.20 Confirmation by the Shark Species Group regarding exemption of the necessity for data submission by CPCs. Rec. 16-13, paragraph 2

- At the Data Preparatory meeting held in March 2017, the Group discussed a list of criteria to review these exemption requests. These criteria are provided below but have not yet been adopted by either the SCRS or the Commission. The Group did not feel they had a clear method to review the exemptions requests received. As such, the Group recommends that no exemptions be granted prior to the adoption of the evaluation criteria recommended by the Group.
 - List of species of sharks ...
 - Evidence that clearly indicate the lack of interactions...
 - Information on the spatial extent of fishing effort..
 - A plan for periodic review of the scientific information that justifies the exemption request