

13.12 SWO-MD-Mediterranean swordfish (*Xiphias gladius*)

Introduction

The most recent assessment of the stock was conducted in 2020, making use of the available catch, effort and size information through 2018. Complete information on the data availability and assessment can be found in the Report of the 2020 Mediterranean Swordfish Stock Assessment (Anon., 2020b). **Table 1** shows a summary of the stock status. **Table 2** provides estimated catches and discards by gear, for the period 2000-2024. The Kobe Phase Plots for both scenarios are summarized in **Figure 1**.

Table 1. Mediterranean swordfish summary table.

<i>Indicator</i>		<i>Stock Status</i>
Maximum Sustainable Yield (MSY)	13,325 t (10,899 t - 17,346 t) ¹	2018
TAC (2024)	9,015.810 ²	
Current (2024) Yield	8,450 t ³	
Relative Biomass (B_{2018}/B_{MSY})	0.72 (0.38 - 1.29) ⁴	
Relative Fishing Mortality (F_{2018}/F_{MSY})	0.93 (0.42 - 1.68) ⁴	
Stock Status	Overfished: YES (86.7% probability of being overfished) ⁵ Overfishing: NO (41.1% probability of overfishing) ⁵	
Management measures in effect	Rec. 03-04 ; Rec. 24-11 TAC (2025) 9,015.810 t	

¹ 95% credibility intervals of 30,000 Markov chain Monte Carlo (MCMC) iterations from Bayesian surplus production models.

² In addition, Egypt and Libya shall have catch limits of 125 t each.

³ Provisional and subject to revision as of 24 September 2025.

⁴ Median and 95% quantiles from base case.

⁵ As estimated from the Kobe plot probability in each quadrant.

Table 2. Estimated catches (t) and discards of Mediterranean swordfish tuna by gear and flag for the period 2000-2024.

		2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
TOTAL	MED	15569	15006	12814	15694	14405	14622	14915	14227	13683	13235	14754	12640	11046	10070	10969	11983	12300	10390	8681	8176	7664	7512	7169	7546	8450
Landings	Longline	7129	7498	8042	10748	10877	10954	11323	11113	11479	11020	11918	10288	9131	9047	9718	10675	10878	8345	6938	8041	7603	7258	6946	7364	8320
	Other surf.	8440	7508	4772	4945	3519	3555	3576	3094	658	819	1347	1162	782	49	83	78	53	57	61	45	60	66	133	74	63
Discards	Longline	0	0	0	0	9	113	16	19	1546	1396	1488	1191	1133	973	1168	1230	1369	1988	1682	89	0.4	188	90	109	68
	Other surf.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0
Landings	CP	816	1081	814	665	564	635	702	601	802	468	459	216	387	403	557	568	671	550	528	517	501	447	472	472	472
	EU-Croatia	0	0	0	0	0	0	0	0	4	3	6	6	4	10	16	10	25	20	28	33	23	25	39	40	40
	EU-Cyprus	82	135	104	47	49	53	43	67	67	38	31	35	35	51	59	54	53	50	45	24	30	56	36	57	61
	EU-España	1436	1484	1498	1226	951	910	1462	1697	2095	2000	1792	1744	1591	1607	2073	2283	1733	1487	1387	1460	1434	1372	1462	1340	1476
	EU-France	0	12	27	20	19	22	20	14	14	16	78	81	12	66	127	182	179	113	86	71	110	96	66	69	81
	EU-Greece	1960	1730	1680	1230	1120	1311	1358	1887	962	1132	1494	1306	877	1731	1344	761	761	392	350	745	657	686	371	444	501
	EU-Italy	7515	6388	3539	8395	6942	7460	7626	6518	4549	5016	6022	5274	4574	2862	3393	4272	3946	2987	1779	2473	2250	2016	2079	2322	3081
	EU-Malta	175	102	257	163	195	362	239	213	260	266	423	532	503	460	376	489	410	330	308	407	361	391	380	360	374
	EU-Portugal	13	115	8	1	120	14	16	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Egypt	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0.4	0	0	0	4	0	4	12	26	73	100
	Japan	2	1	1	0	2	4	0.4	3	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Korea Rep	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Libya	8	6	0	10	2	0	16	0	0	0	0	0	0	0	0	585	960	30	70	26	22	19	21	250	120
	Maroc	2708	3026	3379	3300	3253	2523	2058	1722	1957	1587	1610	1027	802	770	770	480	1110	1000	1013	982	951	924	891	896	896
	Syria	0	0	0	0	0	0	0	37	28	0	0	0	9	4	0	0	0	0	0	0	0	0	0	0	0
	Tunisie	483	567	1138	288	791	791	949	1024	1011	1012	1016	1040	1038	1036	1030	1034	1007	1003	974	934	918	891	857	733	799
	Türkiye	370	360	370	350	386	425	410	423	386	301	334	190	80	97	56	35	77	441	427	414	402	390	379	382	381
Discards	Algerie	0	0	0	0	0	0	0	0	175	102	100	42	78	84	145	147	176	205	197	0	0	0	0	0	0
	EU-Croatia	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.2	1	1
	EU-Cyprus	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.4	0	0.0	0.2	0.4
	EU-España	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7	0	0	84	89	0	188	90	107	67	67
	EU-France	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0.1	0.1
	EU-Greece	0	0	0	0	9	113	16	19	27	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	EU-Italy	0	0	0	0	0	0	0	0	724	751	817	734	618	456	538	670	623	907	535	0	0	0	0	0	0
	Maroc	0	0	0	0	0	0	0	0	343	278	301	160	201	193	198	123	285	350	355	0	0	0	0	0	0
	Tunisie	0	0	0	0	0	0	0	0	221	221	222	227	227	226	272	273	266	374	364	0	0	0	0	0	0
	Türkiye	0	0	0	0	0	0	0	0	55	43	48	27	10	14	16	10	20	151	148	0	0	0	0	0	0

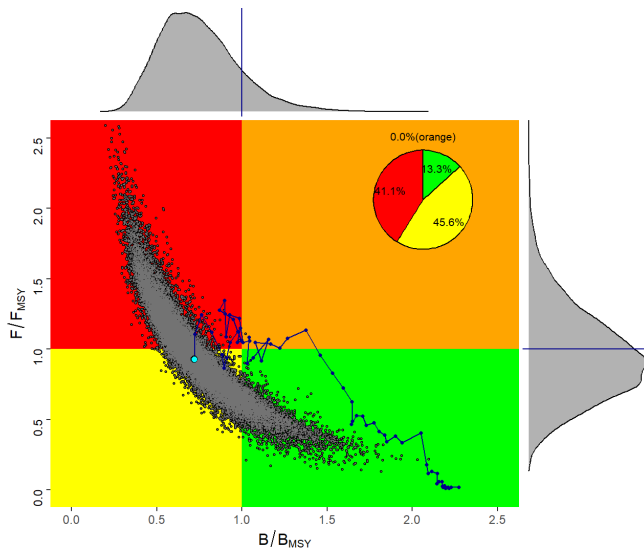


Figure 1. Kobe plot for the Mediterranean swordfish stock status trajectories for the combined posteriors in 2018, estimated during the 2020 stock assessment. The inserted pie chart indicates the probability of the stock being within each Kobe colour quadrant. The probability distributions shown in each axis represent uncertainty around current B/B_{MSY} and F/F_{MSY} . The black line indicates the stock status trajectory starting in 1950.

Outlook

The assessment of Mediterranean swordfish indicated that the stock is most likely overfished and current fishing mortality is just below F_{MSY} levels. The stock has been in an

overfished state since the early 1990s because of the large catches in the 1980s and the selection pattern which captures many immature fish. Current catches are dominated, in terms of number, by fish less than 4 years old and the highest fishing mortality corresponding to fish of age 3. Additionally, estimated recruitment has been declining for the last 10 years.

Projections of different catch levels, based on the output of the production model assessment indicated that a TAC equal to 10,000 t would result in stock rebuilding with a 60% probability by 2028. Projections were not carried out beyond 2028 due to uncertainty with the models. Probabilities of the stock rebuilding increase with catches lower than 10,000 t. It should be noted, however, that these projection estimates were based on the assumption that future stock productivity would be around the average of the whole period studied. The declining recruitment in the terminal years of the assessment may be indicating that stock productivity was decreased and in that case stock projections should be interpreted with caution.

Management recommendations

Over the last 50 years stock biomass showed declining trends. 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. As expected, fishing mortality followed an opposite trend with sharper increases during the 1980s. Stock biomass estimates in 2018 were about 30% lower than that corresponding to MSY, while fishing mortality was 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) was 60% if a TAC equal to 10,000 t was implemented. The probability increased if lower TACs levels were selected. As there are uncertainties regarding stock productivity, these estimates may be optimistic and should be interpreted with caution.

The Committee noted that since the establishment of minimum catching sizes, particularly after the recent size increase imposed through [Recommendation by ICCAT replacing the Recommendation 13-04 and establishing a multi-annual recovery plan for Mediterranean swordfish \(Rec. 16-05\)](#) the discard levels of undersized swordfish are increasing at least for certain fisheries and are largely dead. However, discards are not being reported for all fleets. Though an attempt has been made to statistically estimate discard levels and consider them in stock assessment models, the real volume of total discards is unknown due to this under-reporting. Such under-reporting leads to false estimates of the overall catch volume and consequently bias stock status estimates and projections of future stock size under different management measures.

Table 3. Kobe II matrices for the Mediterranean swordfish stock: a) F being below or equal to F_{MSY} (overfishing not occurring); b) B above or equal to B_{MSY} (not overfished) and; c) B above B_{MSY} and F below F_{MSY} (green zone) for a range of fixed total catches (0-15,000 t) over the projection horizon 2021-2028.

a) Probability that $F \leq F_{MSY}$

TAC Year	2021	2022	2023	2024	2025	2026	2027	2028
0	100	100	100	100	100	100	100	100
7000	84	87	90	91	93	94	94	95
8000	76	80	83	85	87	88	90	90
9000	68	72	75	77	80	81	82	84
10000	58	62	65	68	70	72	73	74
10250	56	60	62	65	67	69	71	72
10500	54	57	60	62	64	66	68	69
10750	51	54	57	59	61	63	64	66
11000	49	52	55	57	59	60	61	63
11250	47	50	52	54	56	57	58	59
11500	45	47	49	51	53	54	55	56
11750	43	45	47	48	50	51	52	53
12000	41	43	44	46	47	48	49	50
12250	39	40	42	43	44	45	45	46
12500	37	38	39	40	41	42	42	43
12750	35	36	37	38	38	39	39	40
13000	33	34	35	35	36	36	36	36
14000	27	27	27	26	26	26	26	25
15000	22	21	20	20	19	18	18	17

b) Probability that $B \geq B_{MSY}$

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	35	38	41	44	47	49	51
11250	31	34	37	40	43	45	47	50
11500	31	34	37	39	42	44	45	47
11750	31	34	36	38	40	42	43	45
12000	31	33	35	37	39	41	42	43
12250	31	33	35	36	37	38	39	40
12500	31	32	33	35	36	37	38	38
12750	31	32	33	34	35	35	36	36
13000	31	32	33	33	34	34	34	34
14000	31	30	30	29	29	28	28	27
15000	31	29	27	26	24	23	22	21

c) Probability that $F < F_{MSY}$ and $B > B_{MSY}$

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

Additional supporting information

The Committee noted the expanded use of trapline gear in the Mediterranean and Atlantic. Initial evidence suggests that catchability, selectivity, and bycatch differ for this gear, relative to typical longline gears. The Committee noted the importance of further research on this gear type and tracking its use in ICCAT fisheries and encouraged CPCs to provide relevant data voluntarily in accordance with the recommendation from the Subcommittee on Statistics.