

13.2 BET - Atlantic bigeye tuna (*Thunnus obesus*)

Introduction

A stock assessment was conducted for bigeye tuna in 2025 using fisheries data through 2023 (Anon., 2025j). Key uncertainties were explored using an uncertainty grid, including natural mortality, steepness, and the selection of an index to represent the abundance of juveniles. The results from 18 uncertainty grid models were weighted by their probability and combined to estimate the current stock status and develop management advice (Kobe II Strategy Matrix (K2SM)). The resulting stock status is provided below (Table 1). The estimated catches and discards by gear, for the period 2000-2024 are shown in Table 2. The Kobe Phase Plot and uncertainty of current status estimates is summarized in Figure 1. The estimated annual probability (%) that the fishing mortality will be below F_{MSY} and the spawning stock biomass will be above SSB_{MSY} in future years under different constant catch scenarios is summarized in Table 3.

Table 1. Atlantic bigeye tuna summary table.

<i>Indicator</i>	<i>Stock Status</i>
Maximum Sustainable Yield (MSY) ¹	2023
TAC (2024)	
Current (2024) Yield ²	
Relative Spawning Biomass (SSB_{2023}/SSB_{MSY})	
Relative Fishing Mortality (F_{2023}/F_{MSY})	
Stock Status	
Management measure in effect	2023

¹ Combined result of 18 stock synthesis model runs using data from 1950-2023.

² Provisional and subject to revision as of 23 September 2025.

³ Point estimate, 80% bias corrected confidence intervals are shown.

⁴ As estimated from the Kobe plot probability in each quadrant.

⁵ Rec. 24-01 only entered in force in June 2025, but other previous Recommendations (Rec. 21-01, Rec. 22-01 and Rec. 23-01) also applied to the BET stock.

Table 2. Estimated catches and discards of Atlantic bigeye tuna by gear, 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	A+M	103434	91636	75801	88282	90043	67954	59192	69895	63172	76427	78750	76492	71317	66977	75310	79563	79214	78256	72600	74905	57556	47209	62641	59229	54964	
Landings	Bait boat	12141	14430	8460	11233	20238	13104	10605	10561	6307	11548	7842	12659	10459	9195	8715	7970	6710	8366	7932	7341	6848	6141	6855	4672	4955	
	Longline	72010	56123	47350	55356	49400	37961	34183	46231	41063	43533	42516	37699	34930	32245	36772	40379	36389	35195	32067	33890	27290	20996	32759	34988	34991	
	Other surf.	459	723	236	451	293	733	552	449	229	258	407	1146	1012	2763	4960	6002	6472	7217	4618	6054	5495	5339	5167	5583	3815	
	Purse seine	17460	20103	19552	20375	19094	15129	13310	11962	14810	20097	24235	23767	24080	22122	24253	24418	28624	26838	27284	26930	17026	14058	16793	13106	10472	
Landings(FP)	Bait boat	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6	6	4	
	Purse seine	1363	257	214	867	1019	1026	542	692	772	1081	669	1019	823	632	609	756	1038	602	673	666	868	646	1028	850	713	
	Discards	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	0	
Discards	Bait boat	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	
	Longline	0	0	0	0	0	0	0	0	0	0	0	0.5	14	0.0	0.0	2	0.3	0.3	26	15	27	26	31	23	34	
	Other surf.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.4	0.4	0.3		
Discards	Purse seine	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	36	0	38	2	10	3	1	2	1	1	
	Landings	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	
	CP	Angola	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	Barbados	18	6	11	16	19	27	18	14	14	7	12	7	15	11	26	30	19	16	29	14	20	25	24	28	14	
	Belize	134	96	0	0	0	0	4	60	70	234	249	1218	1242	1336	1502	1877	1764	1961	2135	2307	991	600	1002	1190	1547	
Landings	Brazil	2768	2659	2582	2455	1496	1081	1479	1593	958	1189	1173	1841	2120	3623	6456	7750	7660	7258	5096	6249	6284	6499	7341	6364	4117	
	Cabo Verde	2	0	1	1	1	1077	1496	1247	444	545	554	1037	713	1333	2271	2764	1690	1107	1418	886	576	171	2	5	5	
Landings	Canada	327	241	279	182	143	187	196	144	130	111	103	137	166	197	218	257	171	214	237	193	104	253	330	379	239	
	China PR	6564	7210	5840	7890	6555	6200	7200	7399	5696	4973	5489	3720	3231	2371	2232	4842	5852	5514	4823	5718	3614	1638	3249	5415	5133	
Landings	Costa Rica	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	
	Cuba	0	0	16	16	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Landings	Curaçao	3098	3757	2221	3203	3526	27	416	252	1721	2348	2688	3441	2890	1964	2315	2573	3598	2844	3530	2787	1519	1701	824	143	0	
	Côte d'Ivoire	2	0	0	0	0	0	0	0	0	790	576	47	507	635	441	12	544	1238	384	2334	141	59	386	64	567	
Landings	EU-España	11250	10133	10572	11120	8365	7618	7454	6675	7494	11966	11272	13100	10914	10062	10736	10058	11469	11544	8400	9117	6067	6596	6424	5920	5258	
	EU-France	5873	5533	4437	4048	2989	2814	2984	1525	1130	2313	3355	3507	3756	3222	3837	2801	4772	4039	4055	5118	2104	1809	3678	2103	1171	
Landings	EU-Ireland	0	10	0	0	0.1	33	0	0	0	0	0	0	0	0	0	0	0	0.2	0	0	0	0	0	0	0	
	EU-Italy	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7	0	0	0	0	0	0	
Landings	EU-Portugal	1498	1605	2590	1655	3204	4146	5071	5505	3422	5605	3682	6920	6128	5345	3869	3135	2187	3146	4405	3146	3069	3106	3123	2787	2535	
	El Salvador	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	992	1450	1826	2634	2464	1518	1492	1479	1196	1542
Landings	FR-Saint Pierre et Miquelon	0	90	21	0.1	28	6	0	2	0	0	2	0	0	0.3	0.1	0	0	0	0	0	0	0	0	0	0	
	Gabon	150	121	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Landings	Gambia	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0	0	0	
	Ghana	5632	9864	6480	9061	17888	8860	2307	2559	3372	4515	6253	3541	4468	2963	4175	5918	5194	3838	3636	2917	3160	2221	3672	2371	2345	
Landings	Great Britain	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	
	Grenada	0.4	0.2	0.3	0	0	0	0	10	31	0	0	0	0	0	0	0	18	23	33	27	19	11	0.3	1	11	3
Landings	Guatemala	0	0	0	736	831	996	949	836	996	913	1011	282	262	163	993	340	1103	1602	1488	1623	906	768	855	596	0	
	Guinea Ecuatorial	0	0	0	0	0	0	0	0	0	0	50	0	0	0	10	17	4	11	7	8	6	6	4	1	4	
Landings	Guinea Rep	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	101	97	
	Japan	24605	18087	15306	19572	18509	14026	15735	17993	16684	16395	15205	13222	15196	1429	902	0	0	0	0	0	0	0	0	0	0	0
Landings	Korea Rep	43	1	87	143	629	770	2067	2136	2599	2134	2646	2762	1908	1151	1039	675	562	432	623	540	587	674	763	724	728	
	Liberia	57	57	57	57	0	0	0	0	0	0	0	0	0	0	0	0	0	27	98	1	3	222	29	0.1	3	0.1
Landings	Libya	400	30	593	593	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	Moroc	1160	1182	1154	1399	1145	786	929	709	802	795	276	300	300	308	300	309	350	410	500	850	1033	1239	1363	1431	1503	
Landings	Mauritania	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	
	Mexico	2	2	6	4	5	4	3	3	1	1	3	1	1	2	1	2	2	3	3	3	3	3	3	4	3	2
Landings	Namibia	589	640	274	215	177	307	283	41	146	108	181	146	108	376	135	240	465	359	141	109	79	568	1185	2070	664	207
	Nigeria	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	Panama	952	562	211	686	1521	2310	2415	2922	2263	2405	3047	3482	1694	2774	2315	1289	2337	1664	2067	3052	1648	1107	1528	1330	827	
	Philippines	975	377	837	855	1854	1743	1816	2368	1874	1890	1399	1267	532	1323	1964	0	0	0	0	0	0	0	0	0	0	0
Landings	Russian Federation	91	0	0	0	1	1	26	73	43	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	S Tomé e Príncipe	4	4	4	4	11	6	4	0	92	94	97	100	103	107	110	633	421	393	2	81	46	90	149	150	141	
Landings	Senegal	915	1159	497	322	490	770	1318	1293	734	1144	969	479	436	606	369	1031	1500	2978	2870	2272	2772	856	746	1174	582	
	Sierra Leone	6	2	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	South Africa	249	239	341	113	270	221	84	171	226	159	145	153	47	435	332	193	121	257	282	432	357	380	464	619	572	
	St Vincent and Grenadines	1921	1143	130	103	16	0	114	567	171	293	396	38	75	25	35	496	622	864	428	504	220	136	568	1	0.2	
Landings	Trinidad and Tobago	5	11	30	6	5	9	12	27	69	56	40	33	33	37	57	37	25	17	13	10	9	10	14	11	14	
	UK-Bermuda	0	0.1	0.2	0.2	0.5	0.5	0	0.4	0.3	0.0	0.2	0.1	0.0	0.2	0.0	0.1	0	0	0	0.4	1	2	1	1	1	
Landings	UK-Sta Helena	8	5	5	4	6	18	25	18	28	17	11</															

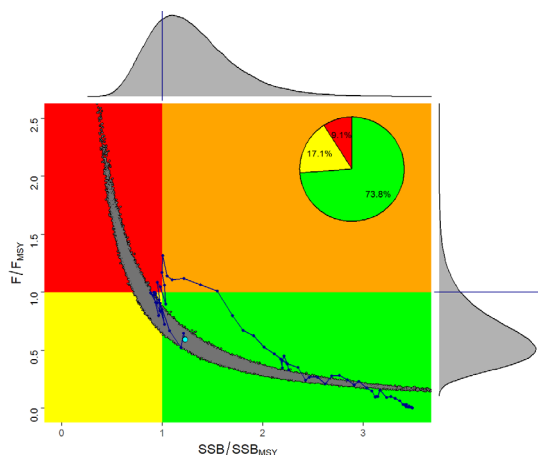


Figure 1. Kobe plot for the Atlantic bigeye tuna stock status in 2023, estimated during the 2025 stock assessment. The line indicates the stock status trajectory starting in 1950. The inserted pie chart indicates the probability of the stock being within each Kobe colour quadrant.

Outlook

The results from 18 uncertainty grid models were weighted by their probability and combined to estimate the current stock status and develop management advice (K2SM). The median estimate of the relative spawning biomass (SSB_{2023}/SSB_{MSY}) was 1.23, indicating that the stock was not overfished in 2023. The median estimate of the relative fishing mortality (F_{2023}/F_{MSY}) was 0.59, indicating that overfishing was not occurring in 2023. The median MSY

was estimated at 86,030 t, which was above the 2024 yield. The probability of the stock being in each quadrant of the Kobe plot in 2023 is provided in **Figure 1**. The corresponding probabilities are 73.8% in the green quadrant, 17.1% in the yellow quadrant, and 9.1% in the red quadrant. Kobe II Strategy Matrices were developed to estimate the probability of achieving the Convention objectives ($SSB \geq SSB_{MSY}$, $F \leq F_{MSY}$) at levels of constant catch from 50,000-100,000 t, for each year up to 2038. The projections assumed that recent (2021-2023) fleet catchability, selectivity and the relative catch between fleets, would continue and recruitment would follow the estimated spawner-recruitment relationship.

Management recommendations

Recommendation by ICCAT replacing Recommendation 22-01 on a multi-annual conservation and management programme for tropical tunas (Rec. 24-01) para 3 set the TAC for bigeye tuna at 73,011 t in 2025 with a provision that subsequent TACs will be set based on the results of the 2025 stock assessment. For example, the TAC would continue at 73,011 t in 2026 and 2027 if the stock assessment conducted in 2025 indicated that the probability of the stock being in the green quadrant in 2034 was at least 65% and could be increased if the probability was at least 70%. According to the K2SM, a future constant catch of 73,011 t has a high probability (91%) of maintaining the stock in the green quadrant of the Kobe plot in 2034 (**Table 3**). Increases in the proportion of small fishes in the harvests has had a consequence for the total production of bigeye tuna fisheries, i.e. reduced yield at MSY (see Additional supporting information). Notwithstanding this, the Committee noted that fishing mortality has decreased in recent years and that F at age 1 has decreased by the greatest proportion (see item 19.30 of this report).

Table 3. Kobe II matrices giving the probability that: a) $F \leq F_{MSY}$; b) $B \geq B_{MSY}$; and c) and the joint probability of $F \leq F_{MSY}$ and $B \geq B_{MSY}$, for given years, and for various constant catch levels based on model results. Note that for BET the biomass (B) refers to spawning stock biomass (SSB).

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

Catch (t)	Probability $F \leq F_{MSY}$																		
	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038						
50000	98%	99%	99%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%						
52500	97%	98%	99%	99%	100%	100%	100%	100%	100%	100%	100%	100%	100%						
55000	97%	98%	99%	99%	100%	100%	100%	100%	100%	100%	100%	100%	100%						
57500	95%	97%	97%	98%	99%	99%	100%	100%	100%	100%	100%	100%	100%						
60000	94%	96%	97%	97%	98%	99%	99%	100%	100%	100%	100%	100%	100%						
62500	93%	94%	95%	96%	97%	98%	98%	99%	99%	100%	100%	100%	100%						
65000	92%	93%	94%	95%	96%	97%	97%	98%	98%	99%	99%	99%	99%						
67500	90%	91%	92%	93%	94%	95%	96%	96%	97%	97%	98%	98%	99%						
70000	88%	89%	91%	92%	93%	94%	95%	95%	96%	96%	97%	97%	97%						
72500	86%	88%	89%	89%	90%	91%	92%	93%	93%	94%	94%	94%	95%						
75000	84%	86%	86%	87%	87%	88%	88%	89%	89%	90%	90%	91%	91%						
77500	82%	83%	84%	84%	84%	85%	85%	86%	86%	86%	87%	87%	87%						
80000	80%	81%	81%	81%	81%	81%	81%	81%	81%	81%	81%	81%	81%						
82500	78%	78%	78%	78%	77%	77%	77%	76%	76%	76%	75%	75%	75%						
85000	75%	75%	74%	74%	73%	72%	72%	71%	70%	70%	69%	69%	69%						
87500	73%	73%	72%	71%	70%	69%	68%	67%	66%	65%	64%	63%	62%						
90000	71%	70%	69%	67%	66%	64%	63%	62%	60%	59%	58%	57%	56%						
92500	68%	67%	65%	64%	62%	60%	58%	57%	55%	54%	53%	51%	50%						
95000	66%	64%	62%	60%	58%	56%	54%	52%	50%	49%	47%	46%	46%						
97500	63%	61%	59%	56%	54%	51%	49%	47%	46%	44%	43%	43%	42%						
100000	61%	58%	56%	53%	50%	47%	45%	43%	42%	40%	40%	40%	39%						

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

Catch (t)	Probability $SSB \geq SSB_{MSY}$																		
	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038						
50000	89%	91%	94%	97%	98%	99%	100%	100%	100%	100%	100%	100%	100%						
52500	86%	90%	94%	96%	98%	99%	100%	100%	100%	100%	100%	100%	100%						
55000	85%	90%	93%	96%	97%	99%	99%	100%	100%	100%	100%	100%	100%						
57500	85%	89%	92%	95%	97%	98%	99%	99%	100%	100%	100%	100%	100%						
60000	85%	88%	91%	94%	96%	97%	98%	99%	99%	100%	100%	100%	100%						
62500	84%	88%	90%	93%	95%	96%	97%	98%	99%	99%	99%	99%	100%						
65000	84%	87%	89%	92%	94%	95%	96%	97%	98%	98%	99%	99%	99%						
67500	83%	86%	89%	92%	94%	95%	96%	97%	97%	98%	98%	98%	99%						
70000	83%	85%	87%	89%	91%	92%	93%	94%	95%	96%	96%	97%	97%						
72500	83%	85%	86%	87%	89%	90%	91%	92%	93%	94%	94%	95%	95%						
75000	83%	85%	86%	87%	88%	89%	90%	91%	92%	93%	94%	94%	95%						
77500	82%	83%	84%	84%	85%	85%	86%	86%	86%	87%	87%	88%	88%						
80000	82%	83%	83%	83%	83%	83%	83%	83%	83%	83%	83%	83%	83%						
82500	82%	82%	82%	81%	81%	81%	80%	80%	80%	79%	79%	78%	78%						
85000	81%	81%	80%	79%	79%	78%	77%	76%	75%	74%	73%	73%	72%						
87500	81%	81%	79%	78%	76%	75%	73%	72%	71%	70%	68%	67%	66%						
90000	81%	80%	78%	76%	74%	72%	70%	68%	66%	65%	63%	62%	60%						
92500	80%	79%	77%	74%	71%	69%	67%	64%	62%	60%	58%	56%	55%						
95000	80%	78%	75%	72%	69%	66%	63%	60%	58%	56%	54%	52%	51%						
97500	80%	77%	74%	70%	67%	63%	60%	57%	54%	52%	50%	49%	48%						
100000	79%	77%	73%	69%	64%	60%	56%	53%	50%	48%	47%	46%	45%						

c) Probability that $F \leq F_{MSY}$ and $B \geq B_{MSY}$

Catch (t)	Probability $F \leq F_{MSY}$ and $SSB \geq SSB_{MSY}$												
	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038
50000	86%	91%	94%	97%	98%	99%	100%	100%	100%	100%	100%	100%	100%
52500	86%	90%	94%	96%	98%	99%	100%	100%	100%	100%	100%	100%	100%
55000	85%	90%	93%	96%	97%	99%	99%	100%	100%	100%	100%	100%	100%
57500	85%	89%	92%	95%	97%	98%	99%	99%	100%	100%	100%	100%	100%
60000	84%	88%	91%	94%	96%	97%	98%	99%	99%	100%	100%	100%	100%
62500	84%	88%	91%	93%	95%	96%	97%	98%	99%	99%	99%	100%	100%
65000	84%	87%	90%	92%	94%	95%	96%	97%	98%	98%	99%	99%	99%
67500	83%	86%	89%	90%	92%	93%	95%	96%	96%	97%	98%	98%	98%
70000	83%	85%	87%	89%	90%	92%	93%	94%	94%	95%	96%	96%	97%
72500	83%	85%	86%	87%	88%	89%	90%	91%	92%	93%	93%	94%	94%
75000	83%	84%	86%	87%	88%	89%	90%	90%	91%	92%	92%	93%	94%
77500	82%	83%	84%	85%	86%	87%	87%	88%	88%	89%	90%	90%	91%
80000	81%	82%	83%	83%	83%	84%	84%	85%	85%	85%	85%	86%	86%
82500	79%	80%	82%	82%	82%	83%	83%	83%	83%	83%	83%	83%	83%
85000	77%	78%	78%	77%	77%	77%	77%	76%	76%	76%	75%	75%	75%
87500	76%	75%	75%	74%	74%	73%	72%	71%	71%	70%	70%	69%	68%
90000	73%	72%	72%	71%	70%	69%	68%	67%	65%	64%	64%	62%	62%
92500	71%	70%	69%	67%	66%	64%	63%	63%	60%	59%	58%	57%	55%
95000	68%	67%	66%	64%	62%	60%	58%	56%	55%	54%	52%	51%	50%
97500	66%	64%	62%	60%	58%	56%	54%	52%	50%	48%	47%	46%	45%
100000	63%	61%	59%	56%	54%	51%	49%	47%	46%	44%	43%	42%	42%
100000	60%	59%	56%	53%	50%	47%	45%	43%	41%	40%	40%	39%	39%

Additional supporting information

The Committee noted that two important sources of uncertainty highlighted in the advice from the 2021 BET stock assessment (Anon., 2021a) (i.e. the development of joint longline index and the assumptions regarding natural mortality) were specifically addressed during this assessment. The Committee agreed that the development of the joint longline index and the assumptions regarding natural mortality for this assessment have been improved.

The Committee also noted the improvement in stock status compared to the 2021 assessment and sought to understand whether this is due to changes in modelling assumptions or the data collected since the last assessment. Noting that the 2021 assessment provided an estimate of stock status for 2019 (based on data available at that time), the Group used the 2025 assessment to look back to see whether our view of stock status back in 2019 had changed (Table 4).

Table 4. Summary of the Atlantic bigeye stock status estimated at the 2021 stock assessment and the current 2025 stock assessment. LB: lower bound, UB: upper bound of estimate.

Stock assessment and year reference	Stock Status					
	SSB/SSB _{MSY}			F/F _{MSY}		
	Median	LB	UB	Median	LB	UB
2021 SA - 2019	0.94	0.71	1.37	1.00	0.63	1.35
2025 SA - 2019	0.97	0.63	1.50	0.91	0.54	1.53
2025 SA - 2023	1.23	0.81	1.86	0.59	0.36	0.98

The estimated stock status in 2019 was similar between the current and the previous 2021 stock assessment, suggesting the changing model assumptions did not substantially affect our historic view of the stock status. Therefore, the Committee concluded the improved stocks status estimated in the 2025 stock assessment results from recovery of the stock.

The Committee also noted that the patterns in the MSY-based reference points were similar to those from the 2021 assessment (Figure 2).

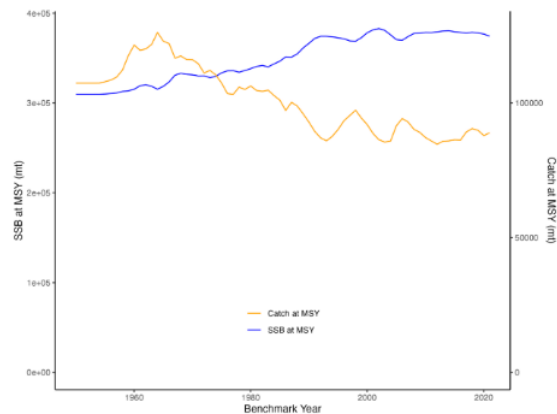


Figure 2. Dynamic SSB_{MSY} and catch at MSY indicating the effects of changes in selectivity for bigeye tuna.