9.7 BFT-W-Western bluefin

BFT-W-2. Fishery indicators

The total catch for the West Atlantic peaked at 18,608 t in 1964, mostly due to the Japanese longline fishery for large fish off Brazil (that started in 1962) and the U.S. purse seine fishery for juvenile fish (**BFT-Table 1**, **BFT-W-Figure 1**). Catches dropped sharply thereafter to slightly above 3,000 t in 1969 with declines in longline catches off Brazil in 1967 and in purse seines (**BFT-Figure 1**). Catches increased to over 5,000 t in the 1970s due to the expansion of the Japanese longline fleet into the Northwest Atlantic and Gulf of Mexico and an increase in purse seine effort targeting larger fish for the sashimi market. Catches declined abruptly in 1982 from close to 6,000 t in the late 1970s and early 1980s with the imposition of a catch limit. The total catch for the West Atlantic, including discards, fluctuated without trend after 1982, reaching 3,319 t in 2002 (the highest since 1981, with all three major fishing nations indicating higher catches). Total catch in the West Atlantic subsequently declined steadily to 1,638 t in 2007 and then fluctuated without pronounced trend. The catch in 2021, 2022 and 2023 was 2,310 t, 2,700 t and 2,566 t, respectively (as of 20 September 2024) (**BFT-W-Figure 1**).

The Committee notes that work conducted as part of the MSE process evaluated the sensitivity to assumed stock of origin of the large historical catches from the off Brazil and found that management procedure (MP) performance was insensitive to the stock of origin of these catches.

The Committee notes that the Total Allowable Catch (TAC) in the West has not been caught for the last 10 years. Based on information received, the Committee considers that this is not due to low stock abundance but rather to market and operational conditions.

For continuity of information, the Committee presents the indices used in the 2021 Western Bluefin Stock Assessment (ICCAT, 2021d) and their updated time series, however the primary source of information on recent indicators comes from the update of the five indices used for the current MP. The current MP uses five indices in each management area (**BFT-Figure 2**). The indices are individually weighted by the inverse of their variance in the MP and are used to develop an overall index that is used to determine the TAC according to specifications outlined in Rec. 22-09. Annually, the Committee evaluates the updated indices for determination of exceptional circumstances (ECs). The Committee evaluated the indicators for determination of ECs according to Rec. 23-07 and results are provided in section 19.12.

The most recent 2021 Western Bluefin Stock Assessment (ICCAT, 2021d) used 10 catch per unit effort (CPUE) and two survey indices up to and including the year 2020 (**BFT-W-Figure 2**). As noted previously, several indices exhibit trends that may be indicative of environmentally driven changes in availability and three of these indices (Can-GSL, US RR>177 and Canada Acoustic index) were not recommended for use in MPs. As in 2017 and 2020, the Stock Synthesis assessment reconciled the conflicting trends in some Canadian and United States indices under a hypothesis of environmentally mediated availability of fish to the two regions. The Canada Acoustic index experienced a very low value for 2018 and subsequently also for 2019; it appears that the index is in a state of transition, possibly due to environmentally driven changes in the spatial distribution of the fish or of their prey. The 2021 Western Bluefin Stock Assessment split the index and, as two years of data would be uninformative for the models, the years 2018 and 2019 were removed until such time as the differences between the time periods can be reconciled.

BFT-W-3. State of the stock

Until such time as a new assessment occurs, the Committee retains the stock status determination from the most recent assessments. In 2021, Stock Synthesis with alternative spawning-at-age scenarios equally weighted across model scenarios was used to determine stock status but not specifically to provide TAC advice. Current F (average of 2018-2020) relative to the $F_{0.1}$ reference point was 0.53 (0.49-0.58, 80% CI), indicating that overfishing was not occurring. The Committee retains the time series of estimated biomass, recruitment and fishing mortality between the two models run in the 2021 Western Bluefin Stock Assessment (SS and VPA (**BFT-W-Figure 3**)). As in the 2020 assessment (ICCAT, 2020a), two spawning fraction scenarios (a young age at spawning, consistent with the eastern stock and older age of spawning with 100% spawning contribution at age 13) were considered in the assessment methods. Rather than presenting two series of spawning stock biomass (SSB) based on these two spawning fraction scenarios, total biomass is presented as this does not depend on which of these scenarios is selected.

The trajectory of $F/F_{0.1}$ for the most recent three Stock Synthesis and VPA assessments (2017, 2020, 2021), illustrates that trend in stock status relative to $F_{0.1}$ are quite similar across model platforms and across assessment years (**BFT-W-Figure 4**). The similarity in stock status relative to overfishing across models and model runs illustrates the utility of using the stock assessments to provide overfishing status, despite many well-documented uncertainties.

BFT-W-4. Outlook

In 1998, the Commission initiated a 20-year rebuilding plan designed to achieve SSB_{MSY} with at least 50% probability. As indicated above, the Committee did not use biomass-based reference points in previous stock assessments. The Committee is not evaluating if the stock is rebuilt because it has been unable to resolve the long-term recruitment potential.

The adopted MP accounts for many of the long-standing uncertainties regarding stock mixing, biomass-based reference points and recruitment that created uncertainty for the outlook for the stock. Furthermore, the Committee is no longer providing projections, TAC advice or Kobe 2 strategy matrices derived from the stock assessments using an $F_{0.1}$ strategy, as the MP provides TAC advice that was simulation tested to achieve MSY-based management objectives.

As noted above, stock assessments will continue to be valuable in providing status checks, to determine whether the MP is achieving the goal of maintaining stock status as well as to estimate recent recruitment. For continuity, the Committee provides the previous time series of $F/F_{0.1}$ showing the fishing status over time relative to the year-specific estimate of $F_{0.1}$ (**BFT-W-Figure 4**) and will update this figure with the next scheduled stock assessment.

BFT-W-5. Effect of current regulations

The 2021 and 2022 TAC recommendations were unlikely to have led to overfishing relative to $F_{0.1}$. The three-year TACs from the adopted MP are, by design, intended to ensure a high probability of maintaining stock status above B_{MSY} and avoiding overfishing.

BFT-W-6. Management recommendations

The Commission adopted a TAC of 2,350 t in 2021 (Rec. 20-06), and a moderate increase to 2,726 t in 2022 (Rec. 21-07) and, with the adoption of the management procedure in 2022 (Rec. 22-09), TAC of 2,726 t for 2023, 2024, and 2025 (Rec. 22-10).

According to the EC protocol in Rec. 23-07 and noted in section 19.12, no EC exist that would warrant deviating from the TAC calculated under the MP for 2025.

Summary table

The estimated mean of the SS models (two maturity specifications) for recent fishing mortality rate for each model was calculated as the geometric mean of F over 2018 to 2020 relative to the F reference point, $F_{0.1}$ (a proxy for F_{MSY}). The values in parenthesis represent the approximate 80% confidence intervals from the hessian-based standard errors or multivariate lognormal approximation approach.

WEST ATLANTIC BLUEFIN TUNA SUMMARY TABLE	
Current catch including discards (2023)	2,566 t*
$F_{CURRENT\ (2018\text{-}2020)}$	0.063 (0.059-0.067)[1]
$F_{0.1}$	0.118 (0.113-0.123)[2]
$F_{CURRENT\ (2018\text{-}2020)}/F_{0.1}$	0.53 (0.49-0.58)[1]
Estimated probability of overfishing ($F_{CURRENT\ (2018\text{-}2020)}$)/$F_{0.1}$)	<1%
Stock status (2020)[3]	Overfishing: No
Management Measures:	Rec. 22-10: TAC of 2,726 t in 2023, 2024 and 2025, including dead discards.

* As of 20 September 2024.

[1] Mean and approximate 80% confidence interval from the multivariate lognormal approximation approach from the assessment.

[2] Mean and approximate 80% confidence interval from the hessian-based standard errors.

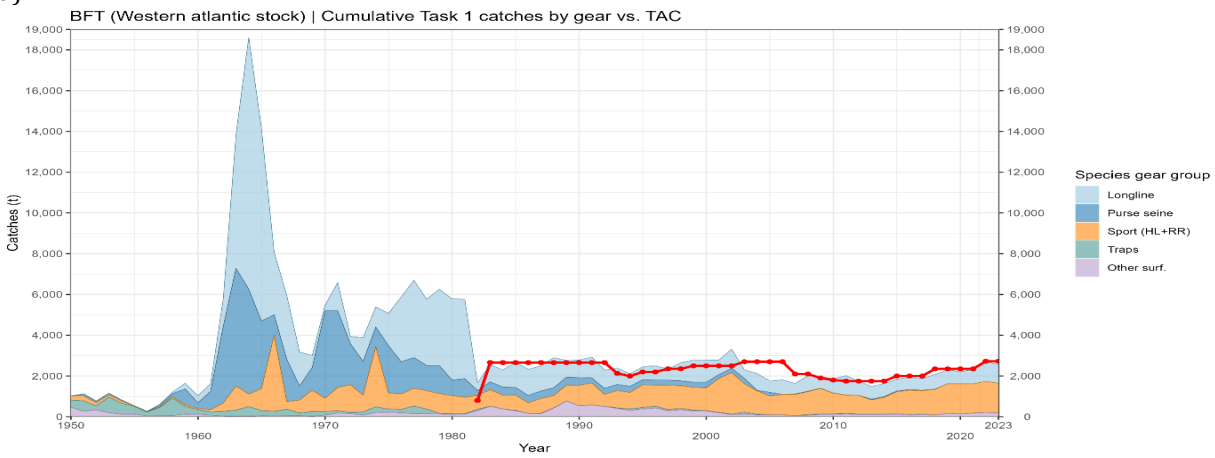
[3] Biomass reference points to determine stock status were not estimated in the 2021 BFT-W SA due to uncertainty in recruitment potential.

BFT-Table 1. Estimated catches (t) of northern bluefin tuna (*Thunnus thynnus*) by area, gear, and flag.

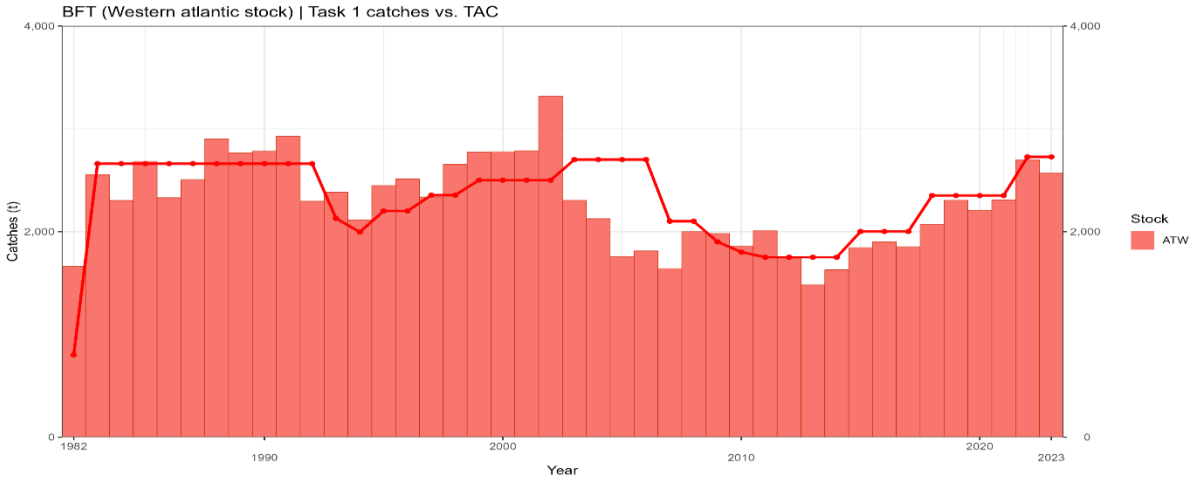
					1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
TOTAL					48881	49751	54009	53546	52638	52772	52775	52785	53319	52306	52125	51757	51813	52639	26463	21799	13197	11782	12689	14726	14889	18057	21314	25517	29853	33442	37255	37407	37809	41814
	ATE				7054	9780	12096	16379	11630	10247	10061	10086	10347	7284	7402	9023	7529	8441	8243	6885	4379	3984	3834	4163	3918	4841	5968	7216	8157	9044	10874	10008	10477	10998
	MED				39715	37523	39399	34832	38371	39754	39940	39914	39654	42606	42999	40977	42473	52560	16220	13135	6961	5791	7101	9082	9344	11374	13445	16451	19636	23092	24174	24789	24632	28250
	ATW				2113	2448	2512	2334	2657	2772	2775	2784	3319	2305	2125	1756	1811	1638	2000	1980	1857	2007	1754	1482	1627	1842	1901	1850	2069	2306	2208	2310	2700	2566
Landings	ATE		Bait boat		2284	3093	5369	7215	3139	1554	2032	2426	2635	1409	1902	2282	1263	2436	2393	1260	725	636	283	243	95	172	1085	1195	692	845	936	1031	1026	1036
			Longline		2311	4522	4212	4057	3789	3570	3736	3303	2896	2748	2064	2700	2033	1705	2491	1951	1194	1125	1139	1167	1194	1467	1829	2208	2730	3128	3313	3249	3294	3633
			Other surf.		590	555	273	60	387	404	509	558	631	521	290	424	831	502	181	297	124	35	49	141	210	193	261	295	340	320	381	359	368	434
			Purse seine		213	458	323	828	700	726	661	153	887	490	1078	1197	408	0	0	2	1	0	0	2	0	0	42	49	11	56	190	147	107	111
			Sport (HL+RR)		25	0	0	237	28	33	126	61	63	109	89	11	99	11	12	11	44	51	53	46	43	104	35	101	118	92	156	267	245	237
			Traps		1630	1152	1921	3982	3586	3980	2996	3585	3235	2116	1978	2408	2895	3788	3166	3164	2292	2137	2311	2564	2376	2905	2716	3362	4258	4594	5889	5255	5434	5541
	MED		Bait boat		0	206	2	4	11	4	38	28	1	9	17	3	0	0	0	38	1	0	2	2	9	25	0	50	56	72	103	81	88	117
			Longline		6993	8469	9836	7313	4117	3338	3424	4144	3234	3484	3096	3427	3408	3269	2376	1344	1242	962	387	605	588	776	1523	1184	1518	1485	1889	1637	1785	2030
			Other surf.		776	545	418	283	284	229	729	354	340	198	197	175	83	86	3	2	3	2	2	21	31	5	38	3	36	53	42	68	61	76
			Purse seine		27948	23799	26021	24279	31792	33799	33237	33043	34044	37291	37869	36639	38363	48994	13540	11448	4986	4293	6172	7982	8184	9993	11340	14493	17128	19515	20872	21987	21596	24659
			Sport (HL+RR)		2307	3562	2149	2340	1092	1533	1773	1167	1520	1404	1325	619	494	117	149	160	448	356	202	240	289	373	308	440	382	611	865	740	717	875
			Traps		1691	942	951	613	1074	852	739	1177	515	221	154	112	125	93	152	144	281	165	125	222	232	192	227	272	300	353	399	252	384	407
	ATW		Longline		539	491	545	382	764	915	858	610	729	186	644	425	565	420	606	366	529	743	478	470	498	553	562	559	706	675	576	653	913	889
			Other surf.		307	384	429	293	342	279	283	201	107	139	97	89	85	63	78	121	107	147	117	121	119	138	93	123	77	168	134	175	209	190
			Purse seine		301	249	245	250	249	248	275	196	208	265	32	178	4	28	0	11	0	0	2	29	38	34	0	0	0	0	0	0	0	
			Sport (HL+RR)		804	1114	1032	1181	1108	1125	1121	1650	2036	1399	1139	924	1005	1023	1134	1251	1009	888	917	692	810	1085	1204	1144	1263	1450	1482	1444	1521	1461
			Traps		79	72	90	59	68	44	16	16	28	84	32	8	3	4	23	23	39	26	17	11	20	6	10	13	3	4	4	4	0	0
Discards	ATE		Longline		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	7	9	8	1	4	5
			Sport (HL+RR)		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	0	0	2
	MED		Longline		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	9	0	0	0	0	0	0	0	82
			Purse seine		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	0	0	0
	ATW		Longline		83	138	167	155	123	160	222	105	211	232	181	131	149	100	159	207	174	202	224	145	139	19	29	10	18	7	8	31	54	25
			Other surf.		0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	3	1	2	2	4	3	3	1
			Purse seine		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	14	4	5	0	0	0	0	0	0	0	
			Sport (HL+RR)		0	0	0	14	3	0	0	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Landings	ATE	CP	Brazil		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	0	0	4
			China PR		0	0	0	0	85	103	80	68	39	19	41	24	42	72	119	42	38	36	36	38	37	45	54	64	79	89	101	101	72	116
			EU-Denmark		0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	3	6	6
			EU-España		3137	3819	6186	9519	4565	4429	3493	3633	4089	2172	2801	3102	2339	3680	3536	2409	1550	1483	1329	1553	1282	1655	1986	2509	2489	2729	3289	2953	3301	3464
			EU-France		336	725	563	269	613	588	542	629	755	648	561	818	1218	629	253	366	228	135	148	223	212	254	343	390	461	462	557	559	540	637
			EU-Ireland		0	0	0	14	21	52	22	8	15	3	1	1	2	1	1	1	2	4	10	13	19	14	32	16	17	6	16	16	20	19
			EU-Netherlands		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	0	0	0	1
			EU-Portugal		363	169	199	712	323	411	441	404	186	61	27	82	104	29	36	53	58	180	223	235	243	263	327	429	450	475	592	614	583	634
			Great Britain		0	1	0	1	1	12	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	3	0	0	0	0	2	5	22
			Guinea Ecuatorial		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	7	0	0	0	0	**0**
			Guinée Rep.		330	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	0	**0**
			Iceland		0	0	0	0	2	27	0	0	1	0	0	0	0	0	0	0	0	2	5	4	30	37	6	0	0	0	1	1	0	1
			Japan		2075	3971	3341	2905	3195	2690	2895	2425	2536	2695	2015	2598	1896	1612	2233	1904	1155	1089	1093	1129	1134	1386	1578	1905	2262	2514	2773	2779	2867	3083
			Korea Rep.		4	205	92	203	0	0	6	1	0	0	3	0	1	0	0	0	0	0	0	0	0	0	161	181	208	232	247	242	252	274
			Maroc		720	678	1035	2068	2341	1591	2228	2497	2565	1795	1953	2389	1923	2418	1947	1909	1348	1055	990	980	959	1176	1433	1703	2164	2476	3089	2884	2704	2611
			Norway		0	0	0	0	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8	44	51	12	49	194	152	123	117
			Panama		1	19	550	255	0	13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
			Senegal		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6	0	0	0	0	0	0	0	0	0	**0**
			Sierra Leone		0	0	0	0	0	0	93	118	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
		NCC	Chinese Taipei		20	4	61	226	350	222	144	304	158	0	0	10	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
		NCO	Faroe Islands		0	0	0	0	67	104	118	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
			ICCAT (RMA)		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	1	6	2	2	2
			NEI (Flag related)		68	189	71	208	66	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
			Seychelles		0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	MED	CP	Albania		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	50	0	0	0	9	34	40	47	56	100	156	168	148	178	264
			Algeria		1560	156	638	829	1674	1760	2083	2098	2056	1504	1440	1500	1673	1489	1311	0	0	0	69	244	244	370	448	1038	1300	1437	1649	1650	1655	1995
			China PR		97	137	93	49	0	20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
			EU-Croatia		1410	1220	1360	1105	906	970	930	903	977	1139	828	1017	1022	825	834	619	389	371	369	384	385	456	515	630	738	827	903	903	816	988
			EU-Cyprus		10	10	10	10	21	31	61	85	91	79	105	149	110	1	132	2	3	10	18	17	18	22	59	110	133	151	153	169	168	189
			EU-España		2741	4607	2588	2209	2000	2003	2772	2234	2215	2512	2353	2758	2689	2414	2465	1769	1056	942	1064	948	1164	1238	1467	1688	2706	2660	2774	3228	2760	3243
			EU-France		11843	9604	9171	8235	7122	6156	6794	6167	5832	5859	6471	8638	7663	10200	2670	3087	1755	805	791	2191	2216	2565	3054	3661	4360	4919	5316	5289	5303	5963
			EU-Greece		886	1004	874	1217	286	248	622	361	438	422	389	318	255	285	330	373	224	172	176	178	161	195	218	235	267	313	354	327	424	367
			EU-Italy		6901	7076	10200	9619	4441	3283	3847	4383	4628	4981	4697	4853	4708	4638	2247	2749	1061	1783	1788	1938	1946	2273	2723	3196	3860	4286	4751	4699	4727	5136
			EU-Malta		580	590	402	396	409	449	378	224	244	258	264	350	270	334	296	316	136	142	137	155	160	182	212	261	308	338	387	382	387	428
			EU-Portugal		306	313	274	37	54	76	61	64	0	2	0	0	11	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	0	0	0	0	0	64	77	77	155	99	124	181	263	122	327	67	**0**
			Iceland		0	0	0	0	0	0	0	0	0	0	0	0	0	0	30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
			Japan		536	813	765	185	361	381	136	152	390	316	638	378	556	466	80	18	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
			Korea Rep.		684	458	591	410	66	0	0	0	0	0	700	1145	26	276	335	102	0	0	77	81	81	0	0	0	0	0	0	0	0	**0**
			Libya		1422	1540	1388	1029	1331	1195	1549	1941	638	752	1300	1091	1327	1358	1318	1082	645	0	756	929	933	1153	1368	1631	1792	2052	2228	2232	2223	2530
			Maroc		1092	1035	586	535	687	636	695	511	421	762	827	108	463	641	531	369	205	182	223	309	310	322	350	439	407	444	365	410	862	1053
			Panama		1499	1498	2830	236	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**
			Syria		0	0	0	0	0	0	0	0	0	0	0	0	0	0	50	41	0	34	0	0	0	40	47	57	66	72	79	0	79	**0**
			Tunisia		2773	1897	2393	2200	1745	2352	2184	2493	2528	791	2378	3249	2545	431	2679	1932	1042	852	1017	1057	1047	1248	1486	1783	2102	2380	2653	2730	2659	2698
			Türkiye		3466	4219	4616	5093	5899	1200	1070	2100	2300	3300	1075	990	806	918	879	665	410	519	536	551	555	1091	1324	1515	1284	1771	2238	2266	2295	3282
		NCC	Chinese Taipei		709	494	411	278	106	27	169	329	508	445	51	267	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
		NCO	Gibraltar		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	13	14	16	15	17	20	22	25	28
			ICCAT (RMA)		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	3	1	1	1	0	0	0	0	1	0
			Israel		0	0	14	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	
			NEI (Flag related)		427	639	171	1058	761	78	17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
			NEI (combined)		773	211	0	101	1030	1995	109	571	508	610	709	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
			NEI (inflated)		0	0	0	0	9471	16894	16458	15298	15880	18873	18376	14164	18343	28234	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
			Palestine		0	0	1	1	1	1	0	0	1	0	1	0	1	1	3	2	2	2	1	1	1	2	2	2	2	2	10	2	2	1
			Serbia & Montenegro		0	2	4	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	ATW	CP	Brazil		0	0	0	0	0	13	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	2
			Canada		392	576	597	503	595	576	549	524	604	557	537	600	733	491	575	530	505	474	477	480	463	531	466	472	550	666	580	626	613	598
			EU-España		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	0	0	**0**
			EU-Portugal		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	0	0	**0**
			FR-St Pierre et Miquelon		0	0	0	0	0	1	0	0	3	1	10	5	0	4	3	2	8	0	0	0	0	9	0	0	0	0	0	0	0	**0**
			Japan		427	387	436	322	691	365	492	506	575	57	470	265	376	277	492	162	353	578	289	317	302	347	345	346	406	406	407	410	657	610
			Korea Rep.		0	0	0	0	0	0	0	0	0	0	0	1	52	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
			Mexico		4	23	19	2	8	14	29	10	12	22	9	10	14	7	7	10	14	14	51	23	51	53	55	34	80	39	28	63	60	39
			Panama		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	0	0	**0**

				1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
			UK-Bermuda	0	0	1	2	2	1	1	1	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1	0	1
			UK-British Virgin Islands	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	0	0	**0**
			UK-Turks and Caicos	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	0	0	**0**
			USA	1163	1311	1285	1334	1235	1213	1212	1583	1840	1426	899	717	468	758	764	1068	803	738	713	502	667	877	1002	986	1013	1185	1178	1177	1311	1292
		NCC	Chinese Taipei	0	4	0	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	0	**0**
		NCO	Argentina	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	0	0	
			Cuba	0	0	0	0	0	0	0	0	74	11	19	27	19	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
			Dominica	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	0	0	
			ICCAT (RMA)	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	0	0	
			NEI (Flag related)	0	0	0	0	0	429	270	49	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
			St a Lucia	43	9	3	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	
Discards	ATE	CP	EU-Denmark	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	0	0	2
			Japan	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	7	9	8	1	4	5
	MED		Albania	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	0	0	0	**0**
			EU-Croatia	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	5	5	2	2	4	5	6	4	5	4	2	3
			EU-Cyprus	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	0	0	0	5
			EU-España	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	9	0	0	0	0	0	0	0	77
			Libya	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7	4	0	0	0	0	0	0	0	0	0	**0**
			Tunisie	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	10	0	5	5	0	0	0	0	0	**0**
			Turkiye	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8	0	0	0	0	0	0	0	0	0	0	0	**0**
	ATW		Canada	0	0	0	6	16	11	46	13	37	14	15	0	2	0	1	3	25	36	17	0	0	3	8	1	4	3	5	5	6	4
			Japan	0	0	0	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1
			Mexico	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
			USA	83	128	171	155	110	149	176	98	174	218	167	131	147	100	158	204	150	166	206	152	143	22	24	10	15	6	8	28	50	20

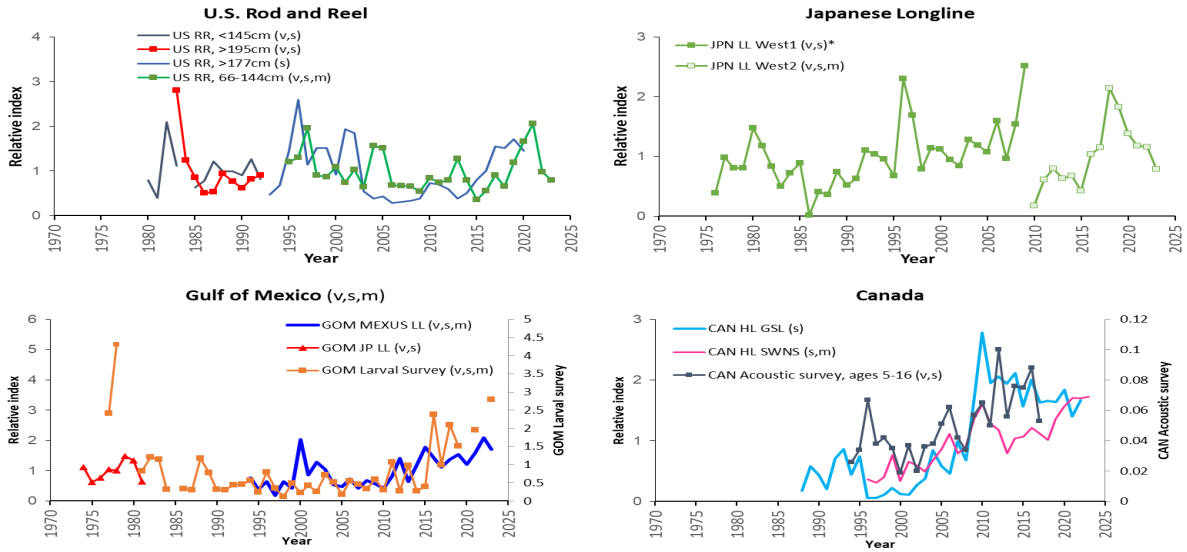
a)



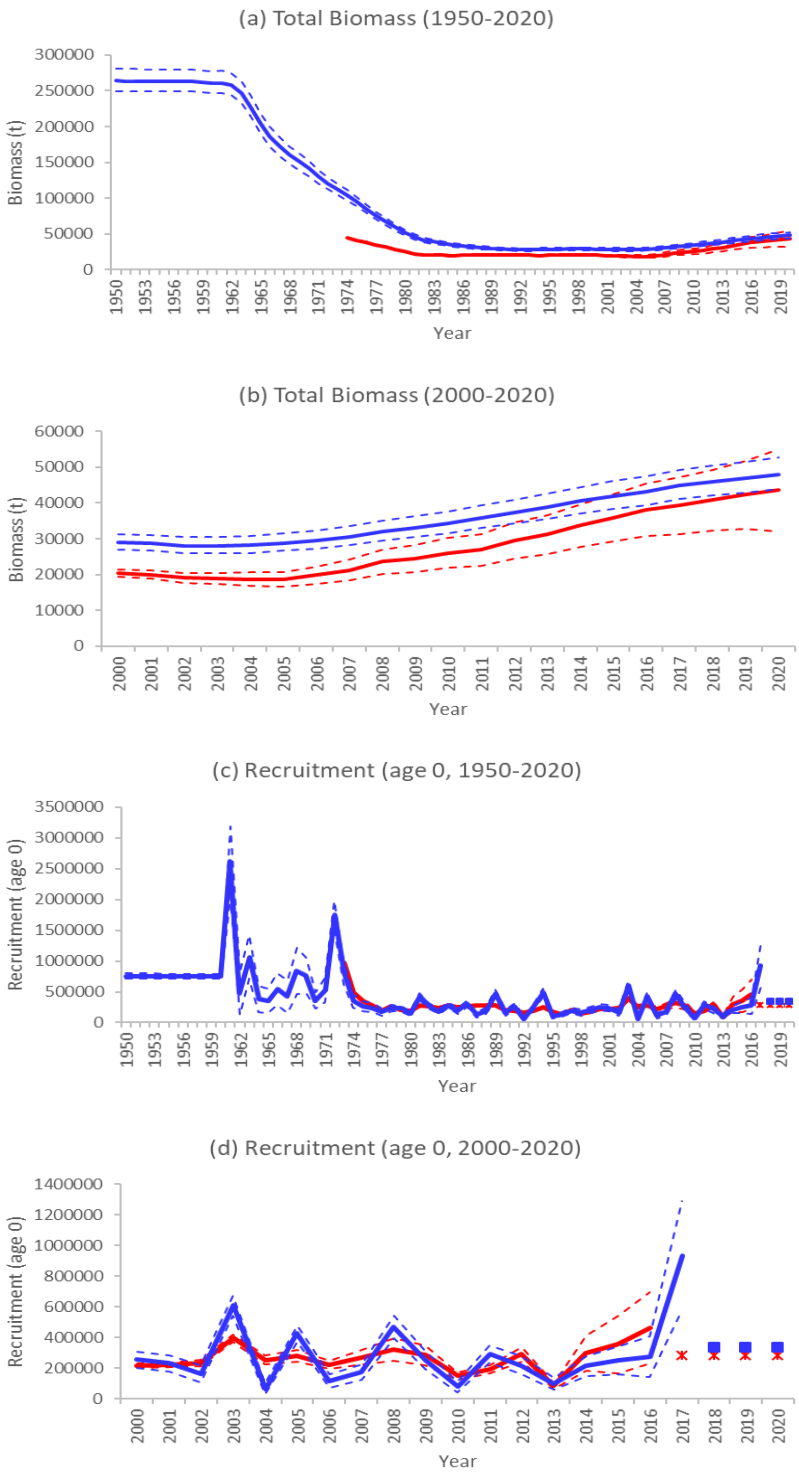
b)



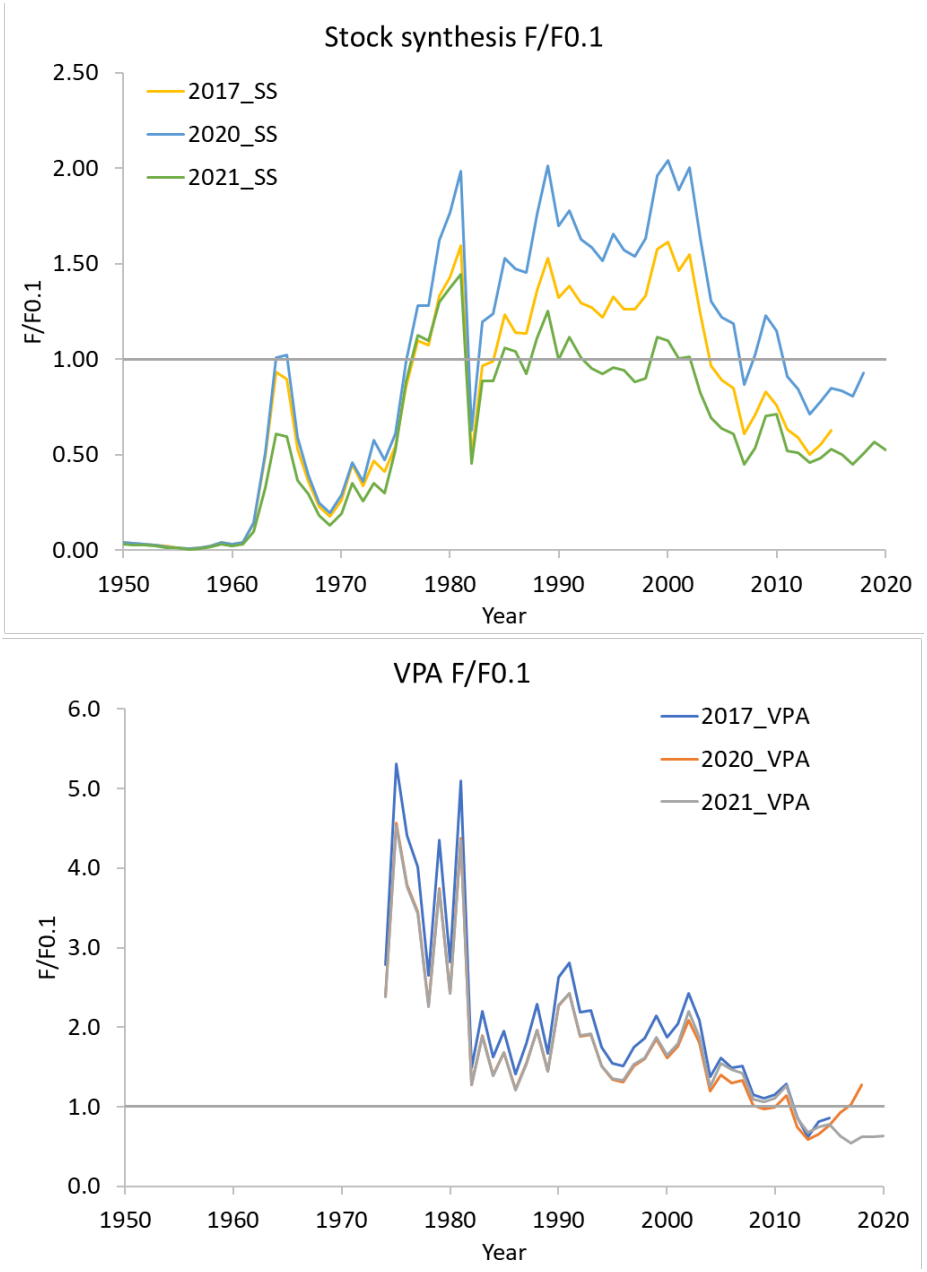
BFT-W-Figure 1. Historical catches of western bluefin tuna: a) by gear type and b) TACs agreed by the Commission (which are shown for comparison) (red dotted lines).



BFT-W-Figure 2. Indices of relative abundance for western bluefin tuna. Indices denoted with an "s" were used in Stock Synthesis, indices with a "v" were used in VPA and indices with a 'm' are used in the management procedure. (*) The 1986 low data point of the Japanese longline in the West Atlantic was removed in the Stock Synthesis models.



BFT-W-Figure 3. Estimates of a) total stock biomass for 1950-2020 and b) for 2000-2020, and c) recruitment (age 0) for 1950-2020 and d) for 2000-2020 for the base VPA (red) and Stock Synthesis (blue) models from the 2021 assessment. The 80% confidence intervals are indicated with dashed lines. Recruitment estimates for the recent years (2017-2020 for VPA; 2018-2020 for Stock Synthesis) have been replaced by the average recruitment in the recent 6 years (2012-2017).



BFT-W-Figure 4. Fishing mortality relative to the $F_{0.1}$ reference point as estimated by Stock Synthesis a) and VPA b) for the 2017, 2020 and 2021 assessments.