

8.1 YFT – YELLOWFIN TUNA

The last assessment for yellowfin tuna was conducted in 2003, at which time catch and effort data through 2001 were available. This report includes the latest data available on catches and the fisheries and focuses on changes that may have taken place since the last assessment. Readers interested in a more complete summary of the state of knowledge on yellowfin tuna should consult the detailed report of the 2003 ICCAT Atlantic Yellowfin Tuna Stock Assessment Session (Anon. 2004).

Other information relevant to yellowfin tuna is presented elsewhere in this SCRS Report:

- The Tropical Tunas Work Plan (**Appendix 5**) includes plans to address research and assessment needs for yellowfin tuna.
- Report of the *2007 Inter-session Meeting of the Tropical Species Working Group* (SCRS/2007/012).

The Report of the Meeting of the Tropical Species Group (Madrid, September 27-28, 2007) is found in SCRS/2007/019.

YFT-1. Biology

Yellowfin tuna is a cosmopolitan species distributed mainly in the tropical and subtropical oceanic waters of the three oceans. The sizes exploited range from 30 cm to 170 cm FL; maturity occurs at about 100 cm FL. Smaller fish (juveniles) form mixed schools with skipjack and juvenile bigeye, and are mainly limited to surface waters, while larger fish form schools in surface and sub-surface waters. Reproductive output among females has been shown to be highly variable. The main spawning ground is the equatorial zone of the Gulf of Guinea, with spawning primarily occurring from January to April. Juveniles are generally found in coastal waters off Africa. In addition, spawning occurs in the Gulf of Mexico, in the southeastern Caribbean Sea, and off Cape Verde, although the relative importance of these spawning grounds is unknown. Although such separate spawning areas might imply separate stocks or substantial heterogeneity in the distribution of yellowfin tuna, a single stock for the entire Atlantic is assumed as a working hypothesis, taking into account the transatlantic migration (from west to east) indicated by tagging, a 40-year time series of longline catch data that indicates yellowfin are distributed continuously throughout the entire tropical Atlantic Ocean, and other information (e.g., time-area size frequency distributions and locations of fishing grounds). Growth rates have been described as relatively slow initially, increasing at the time the fish leave the nursery grounds. Males are predominant in the catches of larger sized fish. Natural mortality is assumed to be higher for juveniles than for adults; this is supported by tagging studies for Pacific yellowfin.

Questions remain concerning the most appropriate growth model for Atlantic yellowfin tuna. A recent study developed a new growth curve using daily growth increment counts from otoliths. The results of this study, along with other recent hard part analyses, do not support the concept of the two-stanza growth model (initial slow growth) which is currently used for ICCAT (as well as other management bodies) yellowfin tuna stock assessments and was developed from length frequency and tagging data. This discrepancy in growth models should be resolved prior to, or accounted for during, future stock assessments.

New information on sizes, sex ratio, and catch rates of yellowfin tuna was presented for the western south Atlantic from the Observer Program of Uruguay. The results indicated that higher catch rates of larger (adult) fish occurred further offshore, are associated with warmer temperature waters, and show seasonal patterns.

YFT-2. Fishery indicators

In contrast to the increasing catches of yellowfin tuna in other oceans worldwide, there has been a steady decline in overall Atlantic catches, declining 36% since 2001 with an overall decline of 46% since the peak catches of 1990. Atlantic surface fishery catches have shown a declining trend from 2001 to 2006, whereas longline catches increased within that period until 2004, then began to decline as well. In the eastern Atlantic, purse seine catches declined from 94,221 t in 2001 to 55,570 t in 2006, a 41% reduction (**YFT-Table 1; YFT-Figure 1**). Baitboat catches declined by 45%, from 19,071 t to 10,434 t. This decrease is largely due to reduced catches by Ghana baitboats, which resulted from a combination of reduced days fishing, a lower number of operational vessels, and the observance of the moratorium on fishing using floating objects. In the western Atlantic, purse seine catches have declined by 66%, from 13,072 t to 4,442 t. Baitboat catches declined by 49%, from 5,315 t to 2,695 t. In the eastern Atlantic, longline catches increased from 5,479 t to 11,428 t in 2004, before declining again to 5,808, a

6% increase from 2001. Similarly, in the western Atlantic, longline catches increased from 12,740 t to 15,953 t in 2004, before declining again to 12,984 t, a 5% increase from 2001. The increase in South African catches in the eastern Atlantic during 2005 and 2006 may be the result of a spillover of Indian Ocean fish caught just inside the Atlantic boundary. The most recent available catch distribution is given in **YFT-Figure 2**.

At the same time, the nominal effort in the purse seine fishery was declining. As an indicator, the number of purse seiners from the European and associated fleet operating in the Atlantic declined from 44 vessels in 2001 to 24 vessels in 2006, with an average age of about 25 years. On the other hand, the European and associated baitboat fleet increased from 15 to 17 vessels during the same period.

Several relevant scientific documents were presented to the 2006 and 2007 SCRS which were descriptive of the catches by country fleets. Examination of nominal catch rate trends from purse seine data suggest that catch-per-unit effort was stable or increasing in the East Atlantic (**YFT-Figure 3a**), and was clearly declining in the West Atlantic (**YFT-Figure 3b**). If effort efficiency is estimated to have continued to increase as has been assumed in the past, adjustments for such efficiency change would be expected to result in a steeper declining trend. However, the decrease in western Atlantic purse seine catch rates could be linked to specific environmental conditions (e.g. high surface temperatures, reduced availability of prey, etc.), especially considering that decreases are also seen in skipjack catch rates, and it is therefore difficult to conclude that these rates reflect abundance trends. New information on fisheries targeting yellowfin tuna of the southwestern Atlantic was presented for Uruguayan fleets, including catch, effort, and CPUE from 1981 through 2006. Standardized catch rates were provided in 2006 for the Japanese and Chinese Taipei longline fishery, but data for 2006 are not yet available. New standardized indices were made available for the Brazilian (through 2005) and United States (through 2006) longline fleets. These indices are compared in **YFT-Figure 4**. The Chinese Taipei index is not shown prior to 1992 in order to avoid a period of shifting targets (from albacore) which is not adequately accounted for in the standardization. The overall trend of the major index shown, Japanese longline, is clearly one of decline, but there is not clear trend in the four years since 2001, the latest data included in the last assessment.

The average weight trends by fleet (1970-2005) are shown in **YFT-Figure 5**. The recent average weight in European purse seine catches, which represent the majority of the landings, has declined to less than half of the average weight of the early 1990s. This decline is at least in part due to changes in selectivity associated with fishing on floating objects. This trend is also reflected in eastern tropical baitboat catches. Longline mean weights have also followed a generally declining trend, although estimates have been highly variable in recent years.

YFT-3. State of the stock

A full assessment was conducted for yellowfin tuna in 2003 applying various age-structured and production models to the available catch data through 2001. The estimate of MSY based upon the equilibrium models ranged from 151,300 to 161,300 t; the estimates of F_{2001}/F_{MSY} ranged from 0.87 to 1.29. The point estimates of MSY based upon the non-equilibrium models ranged from 147,200-148,300 t. The point estimates for F_{2001}/F_{MSY} ranged from 1.02 to 1.46; the main differences in the results were related to the assumptions of each model. The estimate of MSY derived from age-structured virtual population analysis (VPA) was 148,200 t. In summary, these analyses implied that although the 2001 catches of 159,000 t (since revised to 163,000 t) were slightly higher than MSY levels, effective effort may have been either slightly below or above (up to 46%) the MSY level, depending on the assumptions. Yield-per-recruit analyses provided similar estimates of fishing mortality rates and further indicated that an increase in effort was likely to decrease the yield-per-recruit, while reductions in fishing mortality on fish less than 3.2 kg could result in substantial gains in yield-per-recruit and modest gains in spawning biomass-per-recruit.

Since the relatively high catch levels of 2001 (163,000 t), catches have declined each year to a level of 99,500 t, a reduction of 39% and the lowest level of catch since 1973. A potential explanation for this decline is the reduction in eastern Atlantic purse seine effort, but that alone does not explain the reduction of baitboat and purse seine catches in the western Atlantic, nor the more recent declines of longline catches in both the western and eastern Atlantic. Until a full assessment is conducted, it may not be possible to confirm whether catch declines are due to stock level declines or to reduction in effort or other factors. Declines in catch rates could suggest decreases in abundance or availability, and a clear picture does not emerge from the available fishery indicators.

Yearly catches of small (less than 3.2 kg) yellowfin tuna in number have ranged around 60-75% of purse seine catches and about 40-80% of baitboat catches since 2000, occurring primarily in the equatorial fisheries. The generally declining trends in average weight may also be a cause for concern. Minimum size limits for yellowfin tuna have been shown to be ineffective by themselves, due to difficulties related to the multi-species nature of the fishery. The protection of juvenile tunas may be important and alternative approaches to minimum size regulations to accomplish this should be studied.

YFT-4. Effects of current regulations

Recommendation 04-01 implemented a new, smaller closure for the surface fishing in the area 0° -5° N, 10° W-20° W during November in the Gulf of Guinea. Although this regulation is intended to reduce small bigeye catches, the Committee recognizes that its implementation and the change from the previous moratorium to the current regulation will potentially impact yellowfin catches. There are as yet insufficient data to effect an evaluation of the impact of the new regulation.

In 1993, the Commission recommended "that there be no increase in the level of effective fishing effort exerted on Atlantic yellowfin tuna, over the level observed in 1992." As measured by fishing mortality estimates from the 2003 assessment, effective effort in 2001 appeared to be approaching or exceeding the 1992 levels. Catches have been declining since 2001, as has the nominal effort of the purse seiners, but the trend in effective effort is not clear. Additional advice can be offered following the next stock assessment (2008).

ATLANTIC YELLOWFIN TUNA SUMMARY

Maximum Sustainable Yield (MSY) ¹	~148,000 t
Current Yield ²	
(2006)	103,908 t
Replacement Yield (2001)	May be somewhat below 159,000 t
Relative Biomass B_{2001}/B_{MSY} ³	0.73 - 1.10
Relative Fishing Mortality: F_{2001}/F_{MSY} ³	0.87-1.46
F_{99-01}/F_{MSY} ⁴	1.13 (80% confidence limits 0.94 to 1.38)
$F_{0.1}$ ⁴	0.55
F_{MSY} ⁴	0.72

Management measures in effect:

- Effective fishing effort not to exceed 1992 level [Rec. 93-04].
- Rec. 04-01, effective 2005. Season/area closure. Although this measure was intended to reduce the catches of juvenile bigeye tuna, as this is a complete closure, impacts are expected on all tropical tunas.

¹ MSY estimates based upon results of age-structured and non-equilibrium production models, and VPA. The complete range of results from all models is 147,200-161,300 t.

² The assessment was conducted using the available catch data through 2001. Reports for 2006 should be considered provisional and in this case includes carryovers from previous years.

³ These are ranges of point estimates; no estimates of uncertainty were calculated around these point estimates during the assessment.

⁴ Result exclusively from VPA and yield-per-recruit analyses.

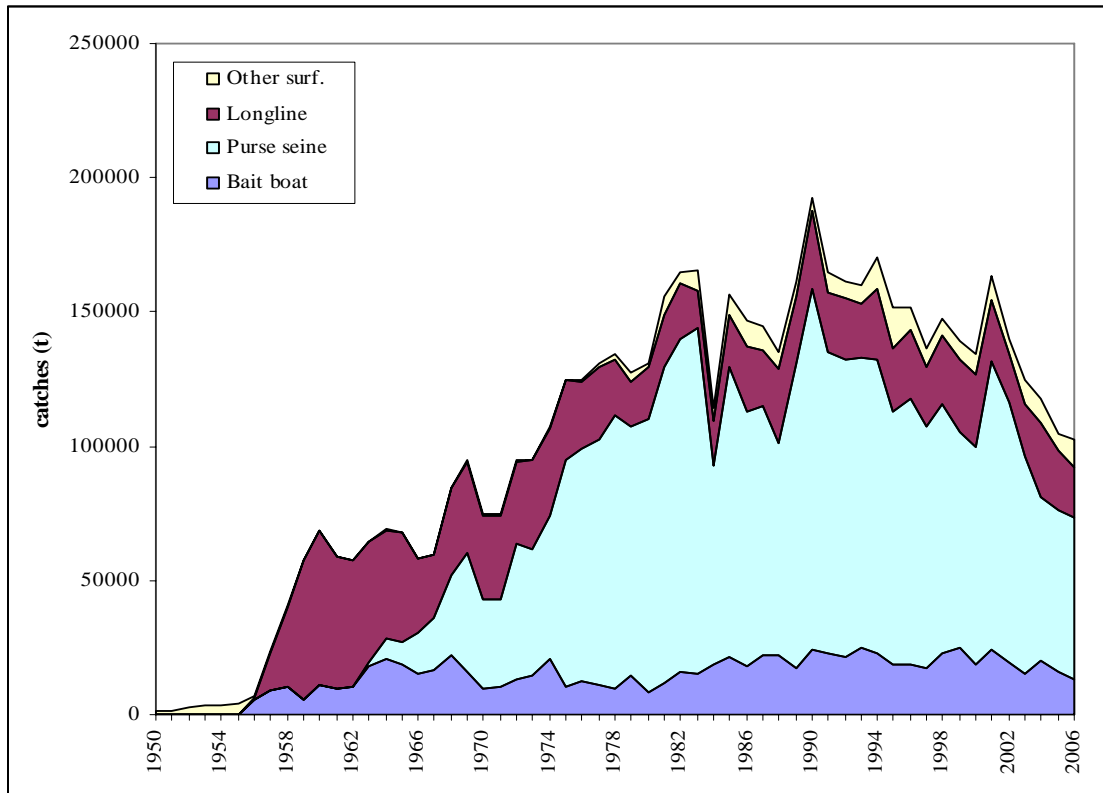
YFT-Table 1. Estimated catches (t) of yellowfin tuna (*Thunnus albacares*) by major area, gear and flag.

			1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006 *	
TOTAL			165001	165373	113940	156547	146535	144428	135219	161322	192456	164716	161364	159963	170527	151939	151754	136125	147320	138886	134224	163100	139558	124401	117409	104437	102216	
	AT.E		138711	124953	76053	113656	106606	110304	99180	123239	157112	124239	121039	116788	116211	110902	113032	99260	110579	102112	96642	120722	109609	98943	86194	77981	75367	
	AT.W		26290	39666	37481	42365	31751	27680	30284	32807	27095	32640	32895	37230	46335	34047	30682	29609	28044	28980	30357	38154	29343	24807	31143	26365	26622	
	UNCL area		0	754	406	526	8178	6444	5755	5276	8249	7837	7430	5944	7982	6990	8040	7256	8697	7794	7225	4224	607	651	73	91	226	
Landings	AT.E	Bait boat	13211	11507	14694	16120	15301	16750	16020	12168	19560	17772	15095	18471	15652	13496	13804	12907	17330	19256	13267	19071	13432	11513	15354	12012	10434	
		Longline	10456	6040	8092	9444	3684	4481	7511	6385	7640	5502	3903	4107	8503	7955	8567	5964	8047	7497	8292	5479	5580	8536	11428	7192	5697	
		Other surf.	3224	3904	2407	1516	2296	2932	2532	2485	2239	3783	2509	2081	1905	1854	1946	2031	1554	1469	2305	1951	1624	2417	1577	1167	3666	
		Purse seine	111820	103502	50860	86576	85325	86141	73117	102200	127673	97182	99532	92130	90151	87597	88715	78358	83647	73891	72777	94221	88973	76476	57835	57610	55570	
	AT.W	Bait boat	2970	3603	3698	5478	2421	5468	5822	4834	4718	5359	6276	6383	7094	5297	4560	4275	5511	5349	5649	5315	6009	3764	4868	3867	2695	
		Longline	9926	6969	8503	9743	12407	9990	14736	13033	13215	9410	11777	9925	9463	8833	8737	8823	8795	11596	11638	12740	11604	10024	15953	14795	12984	
		Other surf.	1282	3345	2077	6150	7101	5557	3692	3293	2362	3457	3483	4842	10166	13580	6601	4801	4581	5345	5200	7027	3763	6413	7104	5069	6496	
		Purse seine	12112	25749	23203	20994	9822	6665	6034	11647	6800	14414	11359	16081	19612	6338	10784	11710	9157	6523	7870	13072	7966	4607	3217	2634	4442	
	UNCL area	Longline	0	754	406	526	8178	6444	5755	5276	8249	7837	7430	5944	7982	6990	8040	7256	8697	7794	7225	4224	528	651	73	91	226	
		Other surf.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	79	0	0	0	0	
Discards	AT.W	Longline	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	167	0	0	0	0	0	0	5	
Landings	AT.E	Angola	1467	788	237	350	59	51	246	67	292	510	441	211	137	216	78	70	115	170	35	34	34	34	34	111		
		Belize (foreign obs.)	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	
		Benin	113	49	65	60	19	3	2	7	1	1	1	1	1	1	1	3	1	1	1	1	1	0	0	0	0	
		Cambodia	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7	0	0	0	0	0	0	0	
		Canada	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	
		Cape Verde	3500	4341	2820	1901	3326	2675	2468	2870	2136	1932	1426	1536	1727	1781	1448	1721	1418	1663	1851	1684	1802	1855	1896	0	2179	
		Cayman Islands	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
		China P.R.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	84	71	1535	1652	586	262	1033	1030	1112	1017
		Chinese Taipei	203	452	87	146	254	193	207	96	2244	2163	1554	1301	3851	2681	3985	2993	3643	3389	4014	2787	3363	4946	4145	1988	638	
		Congo	0	0	0	11	20	15	15	21	22	17	18	17	14	13	12	0	0	0	0	0	0	0	0	0	0	
		Cuba	2251	1916	1467	1585	1332	1295	1694	703	798	658	653	541	238	212	257	269	0	0	0	0	0	0	0	0	0	
		Côte D'Ivoire	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	673	213	99	302	565	175	482	
		EC.España	54164	51946	40049	66874	7	66093	50167	61649	68603	53464	49902	40403	40612	38278	34879	24550	31337	19947	24681	31105	31469	24884	21414	11777	11381	
		EC.Estonia	0	0	0	0	0	0	0	0	0	234	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
		EC.France	45717	40470	7946	12304	17756	17491	21323	30807	45684	34840	33964	36064	35468	29567	33819	29966	30739	31246	29789	32211	32753	32429	23949	22672	18940	
		EC.Ireland	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	
		EC.Latvia	0	0	0	0	0	0	0	0	255	54	16	0	55	151	223	97	25	36	72	334	334	334	334	334		
		EC.Lithuania	0	0	0	0	0	0	0	0	332	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
		EC.Poland	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	
		EC.Portugal	981	1333	1527	36	295	278	188	182	179	328	195	128	126	231	288	176	267	177	194	3	6	4	5	16	274	
		Faroe Islands	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	
		Gabon	0	0	0	0	0	0	0	0	0	0	0	0	12	88	218	225	225	295	225	162	270	245	44	44	44	
		Gambia	0	0	0	0	0	0	0	0	2	16	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
		Georgia	0	0	0	0	0	0	0	0	25	22	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
		Ghana	9797	7689	9039	12550	11821	10830	8555	7035	11988	9254	9331	13283	9984	9268	11720	15437	17657	25268	17662	33546	23674	18457	15054	17493	11931	
		Guatemala	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2906	5207
		Guinea Ecuatorial	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	
		Japan	4815	3062	4344	5765	3634	4521	5808	5882	5887	4467	2961	2627	4194	4770	4246	2733	4092	2101	2286	1550	1534	1999	5066	3265	3265	
		Korea, Republic of	4010	1629	1917	1668	965	1221	1248	1480	324	259	174	169	436	453	297	101	23	94	142	3	8	209	984	95	4	
		Libya	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	208	0	0	0	0	0	
		Maroc	4540	2331	614	2270	2266	1529	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	108	95	183	95	
		NEI (ETRO)	3121	5388	1104	0	2077	3140	5436	12513	4856	10921	9875	8544	8970	9567	6706	7225	5418	5448	10205	8209	5396	4294	6808	6151		
		Namibia	0	0	0	0	0	0	0	0	0	0	0	0	2	14	72	69	3	147	59	165	89	139	85	135	59	
		Netherlands Antilles	0	0	0	0	0	0	0	0	0	0	0	0	0	3183	6082	6110	3962	5441	4793	4035	6185	4161	0	0	1939	
		Norway	0	0	0	0	813	418	493	1787	1790	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
		Panama	1933	1568	1653	3100	0	0	0	0	0	6706	7041	7839	8644	10854	5759	3137	1753	930	1103	574	1022	0	1887	6170	8557	
		Philippines	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	126	173	86	0	50	9	68	69	30	
		Russian Federation	0	0	0	0	0	0	0	0	3200	1862	2160	1503	2936	2696	4275	4931	4359	737	0	0	0	0	0	4	42	
		S. Tomé e Príncipe	193	194	177	180	180	178	184	198	228	223	229	140	0	0	1	4	4	4	4	0	0	0	0	145	137	
		Senegal	0	0	0	0	0	0	0	2	90	132	40	19	6	20	41	208	251	834	252	295	447	279	681	1301	1262	
		Seychelles	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	11	0	0	0	0	

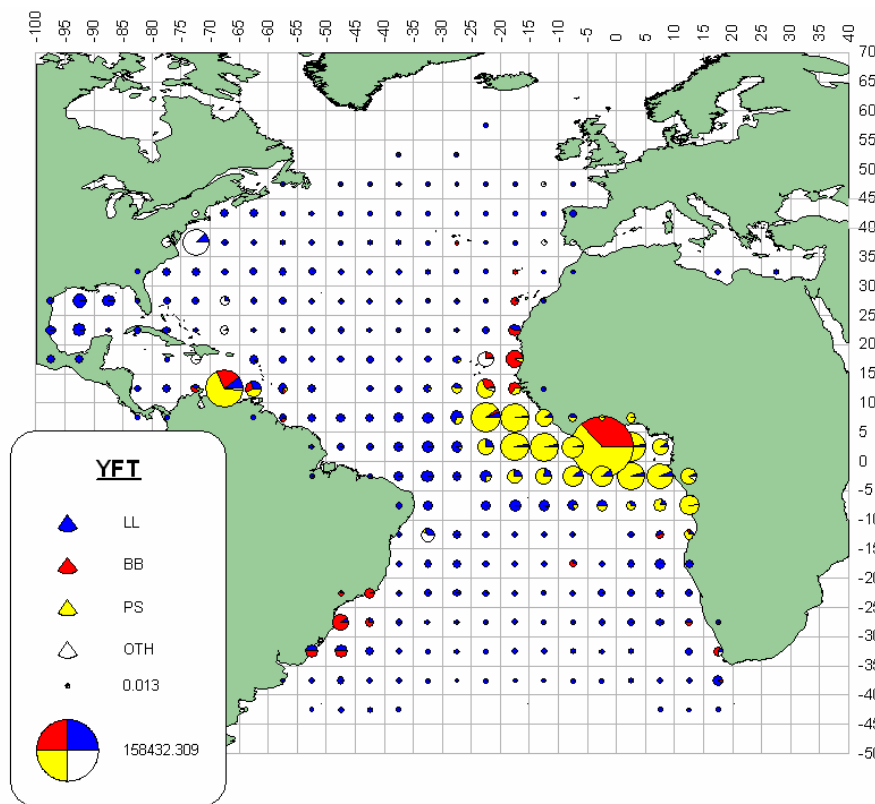
YFT-Table 1 (continued).

	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	
Seychelles (foreign obs.)	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	
South Africa	49	456	759	382	55	68	137	671	624	52	69	266	486	183	157	116	240	320	191	342	152	298	402	1156	1187	
St. Vincent and Grenadines	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	101	
U.S.A.	636	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
U.S.S.R.	1004	1282	2168	3768	1851	1275	3207	4246	3615	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
UK.Sta Helena	97	59	80	72	82	93	98	100	92	100	166	171	150	181	151	109	181	116	136	72	9	0	0	0	344	
Ukraine	0	0	0	0	0	0	0	0	0	215	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Vanuatu	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24	145	
Venezuela	0	0	0	634	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
AT.W																										
Argentina	7	0	0	44	23	18	66	33	23	34	1	0	0	0	0	0	0	0	0	0	0	0	327	327		
Barbados	36	51	90	57	39	57	236	62	89	108	179	161	156	255	160	149	150	155	155	142	115	116	116	116	197	
Belize	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	143	
Brasil	1979	2844	2149	2947	1837	2266	2512	2533	1758	1838	4228	5131	4169	4021	2767	2705	2514	4127	6145	6239	6172	3503	6985	7223	3790	
Canada	0	0	0	0	2	40	30	7	7	29	25	71	52	174	155	100	57	22	105	125	70	73	304	240	293	
China P.R.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	628	655	22	470	435	17	275	74	68	
Chinese Taipei	407	87	559	780	1156	709	1641	762	5221	2009	2974	2895	2809	2017	2668	1473	1685	1022	1647	2018	1296	1540	1679	1608	622	
Colombia	3	29	0	180	211	258	206	136	237	92	95	2404	3418	7172	238	46	46	46	46	46	46	46	46	46	46	
Cuba	1503	793	2538	1906	2081	1062	98	91	53	18	11	1	14	54	40	40	15	15	0	0	65	65	65	65		
Dominica	0	0	0	0	0	0	0	0	18	12	23	30	31	9	0	0	0	80	78	120	169	119	81	119	65	
Dominican Republic	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	89	220	226	226	226	226	226	226		
EC.España	0	1957	3976	1000	0	0	1	3	2	1462	1314	989	7	4	36	34	46	30	171	0	0	0	0	0	0	
EC.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	
EC.Portugal	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	151	60	
Grenada	59	169	146	170	506	186	215	235	530	620	595	858	385	410	523	302	484	430	403	759	593	749	460	492	502	
Jamaica	0	0	0	0	0	0	0	0	0	0	0	0	0	0	21	21	0	0	0	0	0	0	0	0	0	
Japan	3288	1218	1030	2169	2103	1647	2395	3178	1734	1698	1591	469	589	457	1004	806	1081	1304	1775	1141	571	755	1194	1223	1223	
Korea, Republic of	2249	1920	989	1655	853	236	120	1055	484	1	45	11	0	84	156	0	0	0	0	0	0	0	0	580	279	
Mexico	128	612	1059	562	658	33	283	345	112	433	742	855	1093	1126	771	826	788	1283	1390	1084	1133	1313	1208	1050	938	
Netherlands Antilles	173	173	173	150	150	160	170	170	170	150	160	170	155	140	130	130	130	130	130	0	0	0	0	0	0	
Panama	675	62	246	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	0	0	0	0	0	0	1024	
Philippines	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	36	106	78	12	79	145	299	299	234	
Seychelles	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	32	0	0	0	0	0	0	
St. Vincent and Grenadines	0	0	0	0	0	0	0	1	40	48	22	65	16	43	37	35	48	38	33	24	884	568	4251	0	2680	
Sta. Lucia	26	23	56	79	125	76	97	70	58	49	58	92	130	144	110	110	276	123	134	145	94	139	147	172		
Trinidad and Tobago	0	232	31	0	0	0	1	11	304	543	4	4	120	79	183	223	213	163	112	122	125	186	224	295		
U.S.A.	1095	2553	2180	9735	9938	9661	11064	8462	5666	6914	6938	6283	8298	8131	7745	7674	5621	7567	7051	6703	5710	7695	6516	5568	7075	
UK.Bermuda	22	10	11	42	44	25	23	22	15	17	42	58	44	44	67	55	53	59	31	37	48	47	82	61	31	
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	
Uruguay	214	357	368	354	270	109	177	64	18	62	74	20	59	53	171	53	88	45	45	90	91	95	204	644	218	
Vanuatu	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	681	689	661	
Venezuela	14426	26576	21879	20535	11755	11137	10949	15567	10556	16503	13773	16663	24789	9714	13772	14671	13995	11187	10549	18651	11421	7411	5774	5097	6514	
UNCL area																										
China P.R.	0	0	0	0	0	0	0	0	0	0	0	139	156	200	124	0	0	0	0	0	0	0	0	0	0	
Chinese Taipei	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	
EC.España	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	18	226	
Libya	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	73	73	73	73		
Maroc	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	79	0	0	0	0	
NEI (Flag related)	0	754	406	526	956	1297	2324	2780	4100	4318	3836	2671	4404	4202	5962	6100	8339	7409	5269	2883	175	578	0	0	0	
Panama	0	0	0	0	7222	5147	3431	2496	4149	3519	3594	3134	3422	2588	1954	1156	358	385	0	0	0	0	0	0	0	
St. Vincent and Grenadines	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1956	1341	280	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	
Discards AT.W																										
Mexico	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	
AT.W																										
U.S.A.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	167	0	0	0	0	0	0	0	

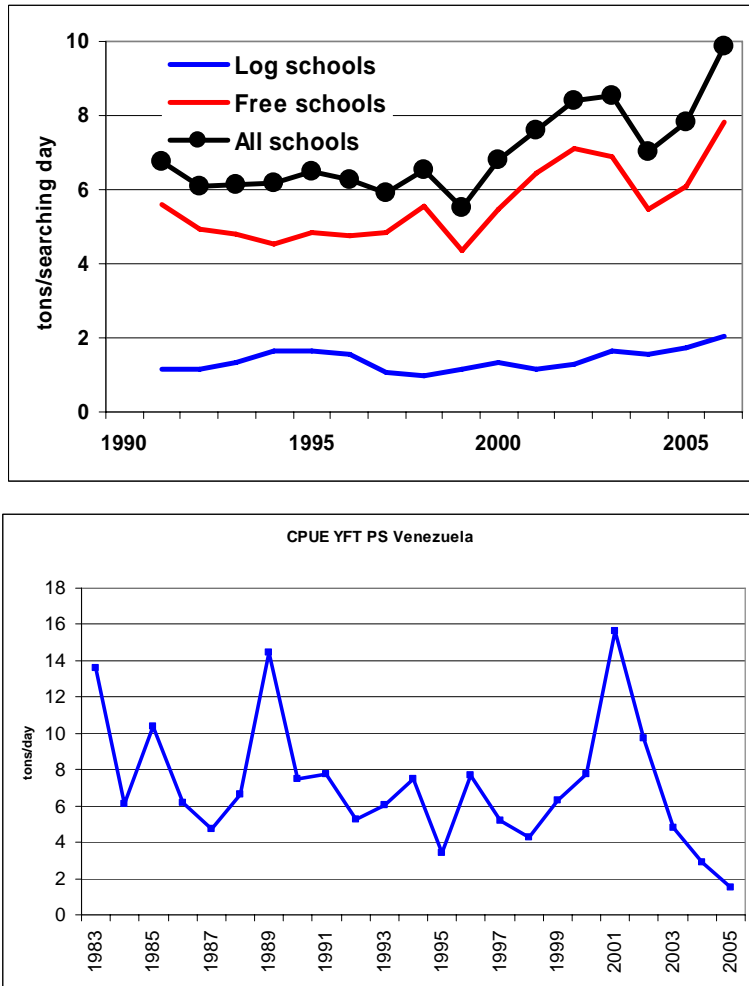
*An estimated Total Yield of 103908 t is obtained (1.66% larger), if 2005 figures of non-reporting Flags in 2006 (shaded cells) are carried over to 2006.



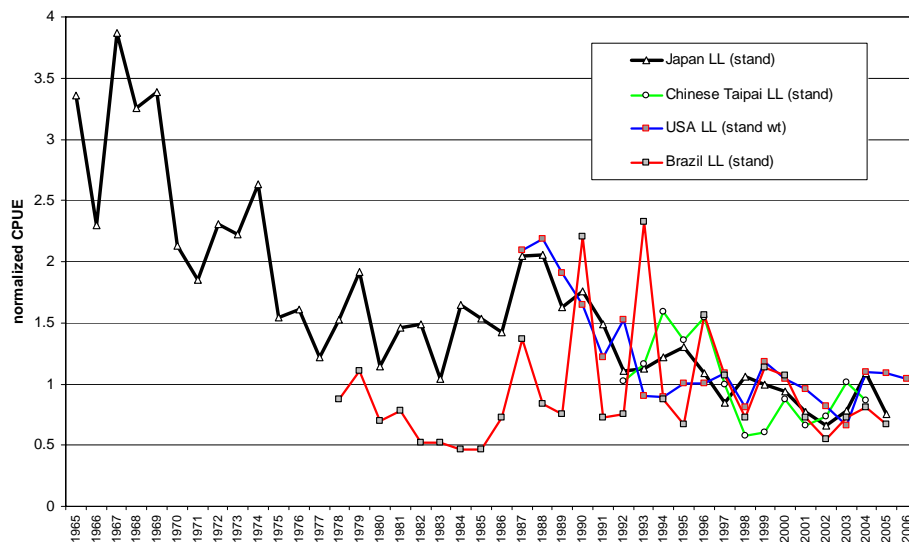
YFT-Figure 1. Estimated annual catch (t) of Atlantic yellowfin tuna by fishing gear, 1950-2006.



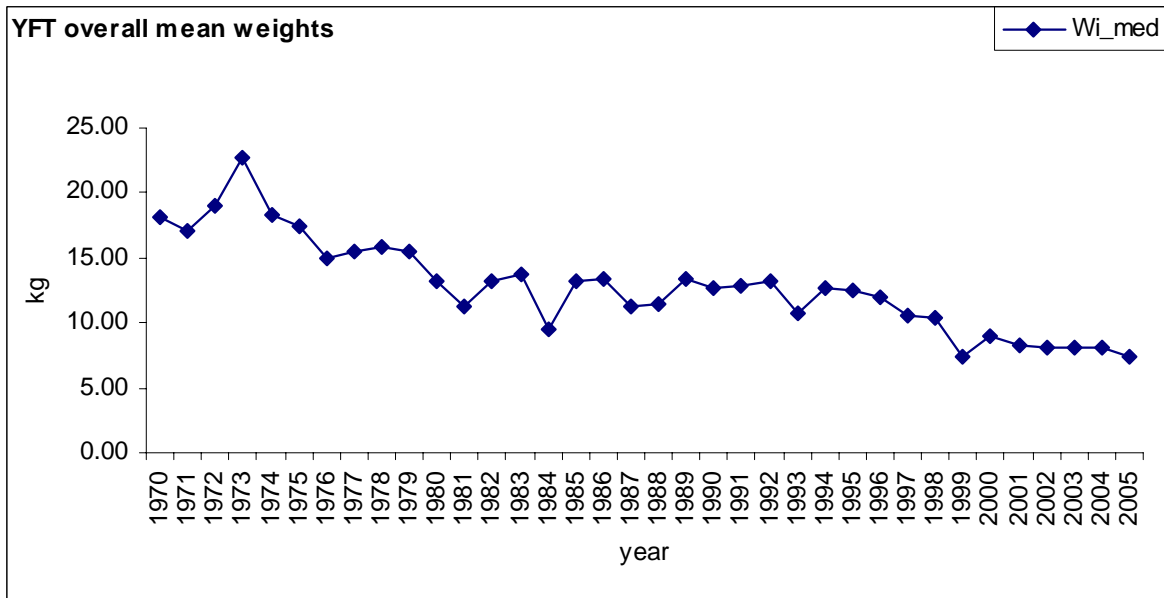
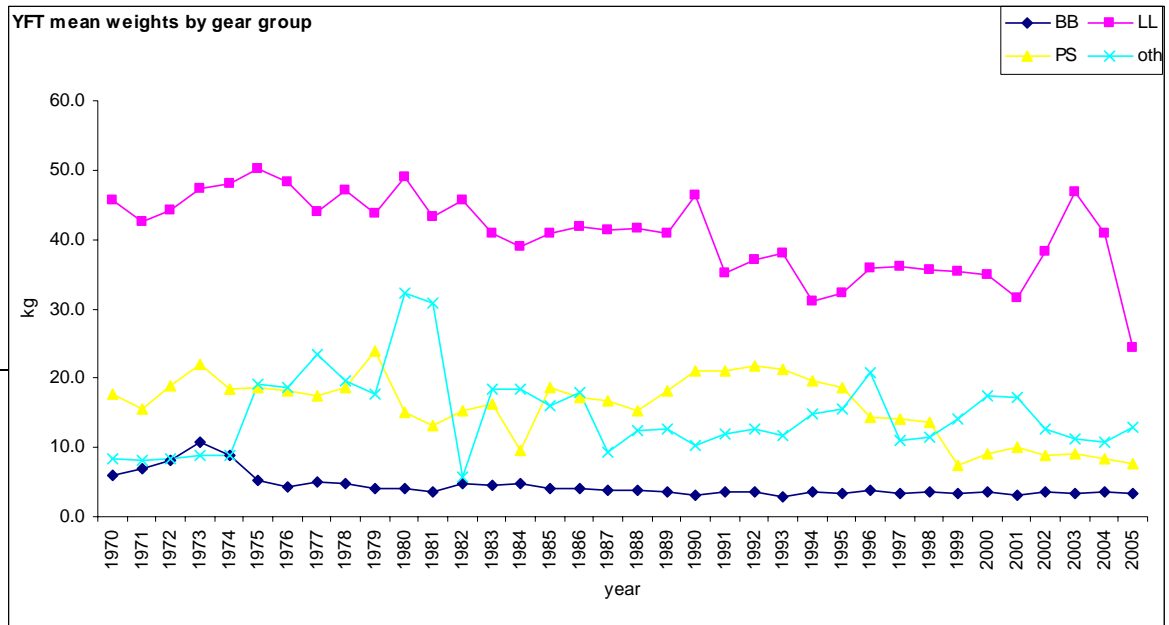
YFT-Figure 2. Geographic distribution of yellowfin tuna catches for most recent years (2000-2004) by major tuna fishery. Ghana's catches have been included in the same 5x5° square, as no detailed information on the spatial distribution of these catches is available.



YFT-Figure 3. Nominal yellowfin tuna catch per unit effort trends for purse seine fleets from the eastern (top) and western (bottom) Atlantic in tons/searching days. No adjustment has been made for estimated increases in fishing power.



YFT-Figure 4. Standardized Atlantic yellowfin tuna catch per unit effort trends (in numbers) for longline fleets. The Chinese Taipei (numbers) index, although partially standardized, has been truncated to begin in 1992 in order to avoid a period of shifting targets which is not adequately accounted for in the standardization.



YFT-Figure 5. Trend in yellowfin tuna average weight by gear group (top panel) and total (bottom panel) calculated from available catch-at-size data. Purse seine averages are calculated across all set types (floating object and free school).