

INTER-AMERICAN TROPICAL TUNA COMMISSION

87TH MEETING

**Lima (Peru)
14-18 July 2014**

SUPPLEMENT TO PROPOSAL IATTC-87 I-1A

SUBMITTED BY JAPAN

**DESCRIPTION OF CALCULATION OF CATCH FOR PACIFIC
BLUEFIN TUNA UNDER/OVER 30 KG FROM EPO FISHERIES FROM
1994 THROUGH 2012**

This paper was prepared by the National Research Institute of Far Seas Fisheries of Japan, which has undertaken a Secretariat role of ISC, under the instruction from ISC PBF Chair and subsequent confirmation and endorsement by the ISC Chair before this submission.

Annual catch for Pacific bluefin tuna (PBF) under/over 30 kg from EPO fisheries, including EPO commercial fisheries and US recreational fishery, from 1994 through 2012 were estimated. The EPO commercial fisheries almost correspond to purse seine of the United States and Mexico and a small portion of catch of these fisheries is yielded by other fisheries of both countries. Annual catch introduced in this paper was based on calendar year, although fishing year, which starts from July and ends to June, is applied in the stock assessment on this species.

Data

1. Catch in number at age by year and by quarter for the EPO commercial fisheries and the US recreational fishery outputted by the base case run of stock assessment model conducted in the latest stock assessment in February 2014 (Table 1).
2. Mean weight (whole weight) in kg at age by quarter for the EPO fisheries outputted by the base case run of stock assessment model conducted in the latest stock assessment in February 2014 (Table 2). The mean weights at age by quarter for the US recreational fishery were the same as those for the EPO commercial fisheries.

Criteria for PBF under/over 30 kg

PBF less than 30 kg correspond to fish of age 2 and younger. Age 0-2 fish are under 30 kg and age 3 and older fish are 30 kg and over.

Calculation

1. Catch in weight at age by quarter and by year were calculated through multiplying catch in number at age by quarter and by year by mean weight at age by quarter.
2. Annual catch in weight at age by year were calculated through summing the catch in weight at age by quarter and by year (Table 3).
3. Annual proportion of catch for PBF under/over 30 kg by year were calculated the catch in weight at age by year (Table 3).
4. Annual catch in weight for PBF under/over 30 kg were calculated by separating annual catch for the EPO fisheries reported to the ISC-PBFWG (Table 4) into annual catch for PBF under/over 30 kg using

the annual proportion.

Results

Annual catch for PBF under/over 30 kg by year and by country for the EPO fisheries were listed in Table 5.

TABLE 1. Catch in number at age by year and by quarter for the EPO commercial fisheries (a) and the US recreational fisheries (b) outputted by the base case run of stock assessment model conducted in the latest stock assessment in February 2014.

(a) EPO commercial fisheries

Fishing year	Quarter of fishing year	Calendar year	Quarter of calendar year	Age 0	Age 1	Age 2	Age 3	Age 4	Age 5	Age 6	Age 7	Age 8	Age 9	Age 10	Age 11	Age 12	Age 13	Age 14	Age 15	Age 16	Age 17	Age 18	Age 19	Age 20
1993	1	1993	3	2	13,041	4,789	13,398	333	28	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1993	2	1993	4	77	4,328	891	2,049	47	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1993	3	1994	1	16	80	11	21	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1993	4	1994	2	122	175	17	29	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1994	1	1994	3	41	48,612	31,592	2,488	3,923	78	6	1	0	0	0	0	0	0	0	0	0	0	0	0	0
1994	2	1994	4	425	3,587	1,284	95	125	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1994	3	1995	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1994	4	1995	2	15	3	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1995	1	1995	3	3	85,131	9,408	1,303	58	74	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1995	2	1995	4	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1995	3	1996	1	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1995	4	1996	2	18,091	54,428	2,761	253	9	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1996	1	1996	3	58	315,262	390,295	17,254	1,504	54	68	1	0	0	0	0	0	0	0	0	0	0	0	0	0
1996	2	1996	4	0	13	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1996	3	1997	1	9	30	15	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1996	4	1997	2	2,462	2,429	873	27	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1997	1	1997	3	12	148,449	77,591	23,542	886	48	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0
1997	2	1997	4	38	2,378	913	248	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1997	3	1998	1	48	238	75	17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1997	4	1998	2	246	384	91	19	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1998	1	1998	3	24	92,725	70,722	13,981	2,677	61	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1998	2	1998	4	55	1,318	600	105	19	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1998	3	1999	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1998	4	1999	2	143,875	79,162	21,266	2,917	474	11	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1999	1	1999	3	8	37,964	9,407	2,183	295	46	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1999	2	1999	4	150	4,364	679	133	16	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1999	3	2000	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1999	4	2000	2	40,551	33,236	2,907	431	47	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2000	1	2000	3	38	238,001	105,479	8,545	1,199	127	20	1	0	0	0	0	0	0	0	0	0	0	0	0	0
2000	2	2000	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2000	3	2001	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2000	4	2001	2	19,752	16,429	3,720	223	27	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2001	1	2001	3	15	55,848	24,294	4,808	269	31	3	1	0	0	0	0	0	0	0	0	0	0	0	0	0
2001	2	2001	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2001	3	2002	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2001	4	2002	2	17,231	12,474	1,589	201	9	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2002	1	2002	3	2	43,746	55,209	9,988	1,724	106	16	2	1	0	0	0	0	0	0	0	0	0	0	0	0
2002	2	2002	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2002	3	2003	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2002	4	2003	2	3,960	32,023	6,165	649	90	5	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2003	1	2003	3	2	47,472	122,650	18,249	1,772	236	14	2	0	0	0	0	0	0	0	0	0	0	0	0	0
2003	2	2003	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2003	3	2004	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2003	4	2004	2	20,606	131,325	68,076	6,465	512	64	4	1	0	0	0	0	0	0	0	0	0	0	0	0	0
2004	1	2004	3	16	107,507	153,980	68,964	6,735	526	66	4	1	0	0	0	0	0	0	0	0	0	0	0	0
2004	2	2004	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2004	3	2005	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2004	4	2005	2	35,717	89,951	17,233	5,201	435	32	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2005	1	2005	3	4	115,996	87,284	13,614	3,877	313	23	3	0	0	0	0	0	0	0	0	0	0	0	0	0
2005	2	2005	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2005	3	2006	1	708	40,349	8,284	945	227	17	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2005	4	2006	2	33,581	277,788	38,648	4,185	968	73	6	1	0	0	0	0	0	0	0	0	0	0	0	0	0
2006	1	2006	3	5	102,317	204,342	25,219	2,845	651	49	4	1	0	0	0	0	0	0	0	0	0	0	0	0
2006	2	2006	4	0	24	20	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2006	3	2007	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2006	4	2007	2	10,861	62,323	21,729	1,818	173	37	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2007	1	2007	3	9	63,503	96,960	26,397	2,128	199	43	3	0	0	0	0	0	0	0	0	0	0	0	0	0
2007	2	2007	4	4	1,758	1,110	254	19	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2007	3	2008	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2007	4	2008	2	33,908	76,804	19,875	3,427	229	20	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2008	1	2008	3	6	118,894	75,746	15,486	2,566	170	16	4	0	0	0	0	0	0	0	0	0	0	0	0	0
2008	2	2008	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2008	3	2009	1	0	4	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2008	4	2009	2	11,294	73,904	8,115	1,011	135	9	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2009	1	2009	3	1	51,106	106,677	9,044	1,048	136	9	1	0	0	0	0	0	0	0	0	0	0	0	0	0
2009	2	2009	4	0	84	85	6	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2009	3	2010	1	0	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2009	4	2010	2	8,289	112,453	40,172	2,031	188	23	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2010	1	2010	3	8	60,063	206,164																		

TABLE 3. Annual catch in weight (ton) at age by year for the EPO commercial fisheries (a) and the US recreational fishery (b).

(a) EPO commercial fisheries

Calendar year	Catch in weight at age																				Proportion		
	Age 0	Age 1	Age 2	Age 3	Age 4	Age 5	Age 6	Age 7	Age 8	Age 9	Age 10	Age 11	Age 12	Age 13	Age 14	Age 15	Age 16	Age 17	Age 18	Age 19	Age 20	Age 0-2	Age 3+
1994	3	449	461	73	178	5	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.78	0.22
1995	0	722	131	36	3	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.95	0.05
1996	137	3,326	5,494	485	67	4	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.94	0.06
1997	19	1,311	1,115	657	30	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.78	0.22
1998	2	806	997	389	118	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.78	0.22
1999	1,091	1,311	642	180	40	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.93	0.07
2000	307	2,417	1,535	252	55	8	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.93	0.07
2001	150	670	425	141	13	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.89	0.11
2002	131	520	805	283	76	7	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.80	0.20
2003	30	786	1,851	528	83	15	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.81	0.19
2004	156	2,483	3,743	2,155	325	37	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.72	0.28
2005	271	2,060	1,619	581	195	21	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.83	0.17
2006	259	4,617	3,915	894	192	46	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.89	0.11
2007	82	1,301	1,878	806	104	15	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.78	0.22
2008	257	1,928	1,521	562	126	12	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.84	0.16
2009	86	1,319	1,678	289	54	9	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.90	0.10
2010	63	1,856	3,813	1,838	154	20	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.74	0.26
2011	39	807	1,096	692	194	12	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.68	0.32
2012	77	2,063	3,175	965	354	73	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.79	0.21

(b) US recreational fishery

Calendar year	Catch in weight at age																				Proportion		
	Age 0	Age 1	Age 2	Age 3	Age 4	Age 5	Age 6	Age 7	Age 8	Age 9	Age 10	Age 11	Age 12	Age 13	Age 14	Age 15	Age 16	Age 17	Age 18	Age 19	Age 20	Age 0-2	Age 3+
1994	0	11	11	2	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.77	0.23
1995	0	121	22	6	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.95	0.05
1996	3	18	10	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.97	0.03
1997	10	42	34	14	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.85	0.15
1998	2	92	109	43	13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.78	0.22
1999	3	237	96	43	9	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.86	0.14
2000	32	114	60	10	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.94	0.06
2001	3	123	84	32	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.86	0.14
2002	6	118	221	78	21	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.77	0.23
2003	0	53	196	57	9	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.79	0.21
2004	0	12	22	16	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.85	0.35
2005	1	27	30	10	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.80	0.20
2006	4	53	32	7	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.91	0.09
2007	0	4	6	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.78	0.22
2008	1	50	50	20	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.80	0.20
2009	0	35	103	17	3	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.87	0.13
2010	1	38	62	27	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.77	0.23
2011	2	114	161	106	31	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.67	0.33
2012	3	151	274	83	31	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.78	0.22

TABLE 4. Annual catch from the EPO fisheries reported to the ISC-PBFWG.

Calendar year	Mexico			United States				EPO Commercial	EPO fisheries	
	Commercial			Commercial			Recreational			
	Purse seine	Others	Total	Purse seine	Others	Total				
1994	63	2	65	906	59	965	89	1,054	1,030	1,118
1995	11		11	657	49	706	258	965	717	975
1996	3,700		3,700	4,639	70	4,709	40	4,749	8,409	8,449
1997	367		367	2,240	133	2,373	156	2,530	2,741	2,897
1998	1	0	1	1,771	281	2,052	413	2,465	2,053	2,466
1999	2,369	35	2,404	184	184	368	441	809	2,772	3,213
2000	3,019	99	3,118	693	61	754	342	1,096	3,873	4,214
2001	863		863	292	48	340	356	696	1,204	1,559
2002	1,708	2	1,710	50	12	62	654	717	1,772	2,427
2003	3,211	43	3,254	22	18	40	394	434	3,294	3,689
2004	8,880	14	8,894		11	11	49	60	8,905	8,954
2005	4,542		4,542	201	7	208	79	287	4,750	4,830
2006	9,927		9,927		2	2	96	98	9,929	10,025
2007	4,147		4,147	42	2	44	14	58	4,191	4,205
2008	4,392	15	4,407		1	1	93	94	4,408	4,501
2009	3,019		3,019	410	5	415	176	591	3,434	3,610
2010	7,746		7,746		1	1	122	123	7,747	7,869
2011	2,730	1	2,731		120	120	499	619	2,851	3,350
2012	6,667	1	6,668		43	43	617	660	6,711	7,328

TABLE 5. Annual catch for PBF under/over 30 kg by year and by country for the EPO fisheries.

Calendar year	Mexico		United States						EPO commercial		EPO fisheries	
	Commercial		Commercial		Recreational		Total		< 30 kg	≥ 30 kg	< 30 kg	≥ 30 kg
	< 30 kg	≥ 30 kg	< 30 kg	≥ 30 kg	< 30 kg	≥ 30 kg	< 30 kg	≥ 30 kg				
1994	51	14	753	212	69	20	822	232	804	226	873	246
1995	10	1	672	34	246	12	918	46	682	34	928	47
1996	3,482	218	4,431	278	39	1	4,470	279	7,913	496	7,952	497
1997	287	81	1,851	522	133	24	1,984	546	2,138	603	2,270	627
1998	1	0	1,599	453	324	89	1,923	542	1,599	453	1,923	542
1999	2,239	165	343	25	379	62	722	87	2,582	190	2,961	252
2000	2,902	216	702	52	322	20	1,024	72	3,604	269	3,926	289
2001	767	97	302	38	304	51	606	89	1,069	135	1,373	186
2002	1,366	344	50	13	505	150	555	162	1,416	357	1,921	506
2003	2,635	619	32	8	310	84	343	92	2,667	627	2,977	711
2004	6,375	2,519	8	3	32	17	40	20	6,383	2,522	6,415	2,539
2005	3,778	765	173	35	64	16	237	51	3,951	800	4,015	815
2006	8,791	1,136	2	0	88	9	89	9	8,792	1,137	8,880	1,146
2007	3,227	920	34	10	11	3	45	13	3,261	930	3,272	933
2008	3,706	701	1	0	74	19	75	19	3,706	702	3,781	720
2009	2,709	310	372	43	153	23	525	66	3,081	353	3,234	376
2010	5,731	2,015	1	0	94	28	95	28	5,731	2,016	5,826	2,043
2011	1,866	865	82	38	332	167	414	205	1,948	903	2,281	1,069
2012	5,280	1,388	34	9	481	136	516	144	5,314	1,397	5,795	1,533
Mean of 02-04	3,458	1,161	30	8	282	84	312	91	3,488	1,169	3,771	1,252