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EVALUATION OF TUNA CONSERVATION PROPOSALS

This document provides additional comments on the management proposals IATTC-91 G-1C and IATTC-91 G-2B, submitted by the United States and Ecuador-Colombia, respectively, which are fundamentally different. In essence, the US proposal is a system of individual vessel limits (IVLs) based on capacity, while the Ecuador-Colombia proposal establishes national limits. Both limits are calculated based on recent catch. However, in calculating the IVLs, the US proposal assumes that in the future vessels will fish in a manner similar to how they fished in the past. Therefore, if the vessels change their fishing behavior (or the size of the stock changes), the total catch may increase or decrease. However, it is unlikely that all vessels will change their behavior enough to fully utilize their IVL. One benefit of the IVL system is that vessels that historically caught large amounts of bigeye and yellowfin tuna relative to their capacity will have to reduce their catches the most. In contrast, the effect of the national limits will depend on how each country distributes the catch limit among its vessels. To prevent the IVL system resulting in higher catch due to changes in fishing behavior, it could be combined with an overall catch limit, which could be by vessel, by country, or simply a total limit. Another advantage of the IVL system is that it might be responsive to changes in stock size (catches decrease if the stock size decreases), thus building in a safety mechanism.

A more detailed description of the methods for evaluating these two proposals is provided in Document [IATTC-90 INF-B Addendum 1](#), and a description of how the equivalent days of closure were calculated is given in Document [IATTC-90 INF-B](#).

For the analysis presented in this document, the capacity, weighted by effort (in days fished), was updated to include data for 2016 and 2011-2012, to cover the 2011-2016 period (Table 1). However, since data on days fished are not available for all trips, days at sea was used as a proxy, and all days in a trip were included if that trip had at least one day of fishing activity in the EPO. The calculation was done for size class 6 vessels with and without an AIDCP Dolphin Mortality Limit (DML), and for Class-4 and -5 vessels combined. The results show that capacity weighted by days at sea increased in 2016 compared to 2015 for Class-6 vessels with and without DMLs, but decreased for Class-4 and -5 vessels; similarly, the overall weighted capacity has increased substantially since 2011 for both categories of Class-6 vessels, but not for Class-4 and -5 vessels. The unweighted data also show overall increases in capacity, but the magnitude differs (Table 2). The results are similar to those previously presented based on weighted capacity, except for the change from 2014 to 2015 in the unweighted capacity of vessels without DMLs (Document [IATTC-90 INF-B Addendum 1](#)).

Table 3 shows the equivalent days of closure for different IVL values, calculated as described in the US proposal. The IVL values are from Figure 1 of Document [IATTC-90 INF-B Addendum 1](#).

Figure 1 and Table 4 show the equivalent days of closure for different reductions in catch for the fishery on floating objects by Class-6 vessels, as described in the Ecuador-Colombia proposal. The slight difference in the number of equivalent days of closure for a 5% reduction in bigeye catch compared to Document [IATTC-90 INF-B Addendum 1](#) is due to rounding before or after the calculations.

TABLE 1. Capacity, in cubic meters (m³) of well volume, weighted by days at sea, of the purse-seine fleet in the EPO, 2011-2016, by vessel size class and DML status. Includes all days for trips with at least one day of fishing activity in the EPO.

Vessel		Weighted capacity (m ³)							
Class	DML status	2011	2012	2013	2014	2015	2016		
6	No DML	52,391	56,997	55,254	59,167	64,516	67,929		
6	DML	67,185	69,203	68,914	69,104	75,556	83,085		
6	All	119,576	126,200	124,168	128,271	140,072	151,013		
4+5	-	8,460	8,845	9,059	9,889	9,772	8,775		
Total		128,036	135,045	133,227	138,160	149,844	159,788		
		Change from previous year						Since	
		2011	2012	2013	2014	2015	2016	2013	2011
6	No DML		1.09	0.97	1.07	1.09	1.05	1.23	1.30
6	DML		1.03	1.00	1.00	1.09	1.10	1.21	1.24
6	All		1.06	0.98	1.03	1.09	1.08	1.22	1.26
4+5	-		1.05	1.02	1.09	0.99	0.90	0.97	1.04

TABLE 2. Unweighted capacity, in cubic meters (m³) of well volume, of the purse-seine fleet in the EPO, 2011-2016, by vessel size class and DML status. Includes all days for trips with at least one day of fishing activity in the EPO.

Vessel		Unweighted capacity (m ³)							
Class	DML status	2011	2012	2013	2014	2015	2016		
6	No DML	94,982	94,607	86,899	104,888	118,663	118,592		
6	DML	115,961	110,119	108,933	112,185	119,032	129,000		
6	All	210,943	204,726	195,832	217,073	237,695	247,592		
4+5	-	14,229	14,358	14,574	14,866	15,965	15,482		
Total		227,183	221,096	212,419	233,953	255,675	265,090		
		Change from previous year						Since	
		2011	2012	2013	2014	2015	2016	2013	2011
6	No DML		1.00	0.92	1.21	1.13	1.00	1.36	1.25
6	DML		0.95	0.99	1.03	1.06	1.08	1.18	1.11
6	All		0.97	0.96	1.11	1.10	1.04	1.26	1.17
4+5	-		1.01	1.02	1.02	1.07	0.97	1.06	1.09

TABLE 3. Equivalent days of closure for different IVL values, in tonnes per cubic meter of well volume, calculated based on capacity as described in the US proposal, by species and set type. BET: bigeye; YFT: yellowfin; OBJ: floating-object set; NOA: unassociated set.

IVL	2012	2013	2014	2015
YFT: OBJ				
.5	51	53	48	47
0.6	43	44	38	37
0.7	35	36	30	27
0.8	28	29	23	18
0.9	23	24	17	11
1	19	20	12	5
1.1	15	17	8	0
1.2	12	14	6	-3
1.3	9	13	3	-6
1.4	7	12	1	-9
1.5	6	11	0	-10

IVL	2012	2013	2014	2015
BET: OBJ				
0.5	111	115	104	103
0.6	92	95	83	79
0.7	76	78	65	58
0.8	62	63	50	39
0.9	51	51	38	24
1	41	43	27	12
1.1	33	36	18	0
1.2	26	31	12	-8
1.3	20	28	7	-14
1.4	16	26	3	-19
1.5	14	25	1	-22

YFT: OBJ + NOA				
0.5	94	97	89	77
0.6	79	82	72	57
0.7	66	68	59	39
0.8	54	56	47	24
0.9	45	46	38	11
1	37	39	30	1
1.1	31	33	23	-8
1.2	25	28	18	-15
1.3	21	26	13	-20
1.4	17	25	9	-25
1.5	15	23	7	-28

BET: OBJ + NOA				
0.5	116	120	110	95
0.6	98	101	90	70
0.7	82	84	73	48
0.8	67	69	59	29
0.9	56	57	47	14
1	46	48	37	1
1.1	38	41	28	-10
1.2	31	35	22	-18
1.3	26	32	16	-25
1.4	21	31	11	-31
1.5	19	29	8	-34

TABLE 4. Equivalent days of closure for different percentage reductions in catch by Class-6 vessels on floating objects, as described in the Ecuador-Colombia proposal, by species. BET: bigeye; YFT: yellowfin.

Decrease (%)	BET	YFT	YFT*3 ¹
1	3	0	1
2	5	1	2
3	8	1	4
4	10	2	5
5	13	2	6
6	16	2	7
7	18	3	8
8	21	3	10
9	24	4	11
10	26	4	12

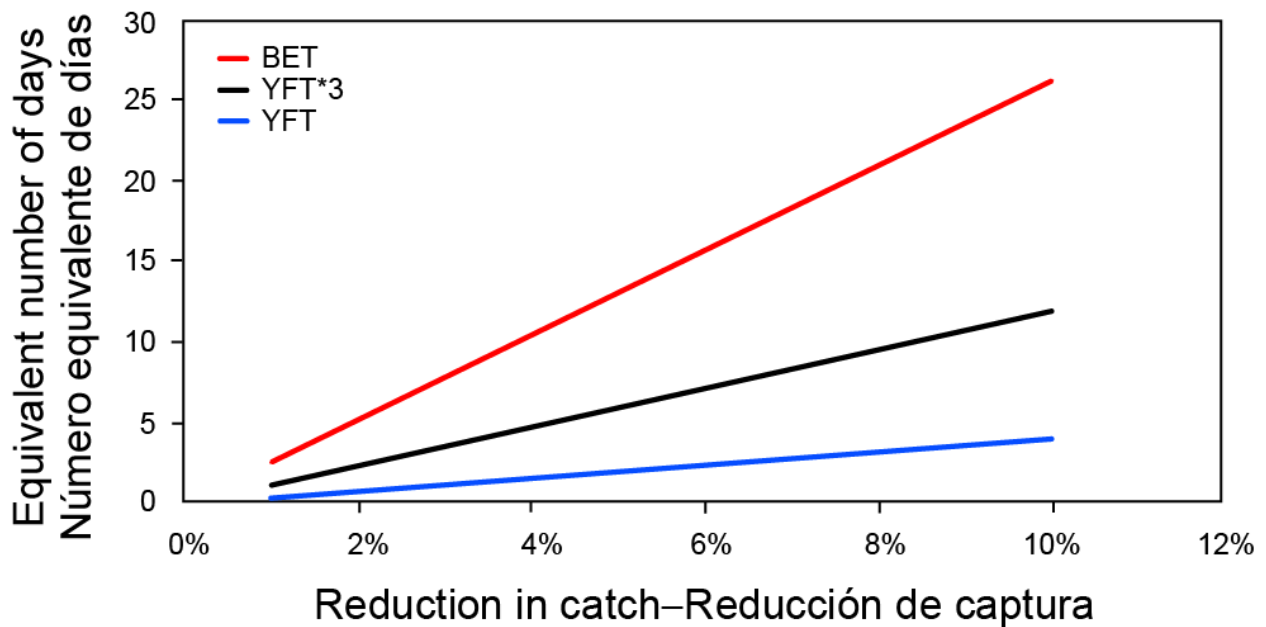


FIGURE 1. Equivalent days of closure for different reductions in catch on floating objects by Class-6 vessels, as described in the Colombia-Ecuador proposal, by species. BET: bigeye; YFT: yellowfin.

¹ YFT*3 is the equivalent days of closure multiplied by 3 to represent that floating-object fisheries capture small yellowfin, and the impact may be three times larger than that of capturing large yellowfin, as in the dolphin-associated fishery. The differences between YFT multiplied by 3 and YFT*3 are due to rounding.