



**An Update on PBF catch size composition for the Mexican fishery directed to farming operations in the EPO (2012-2013)**

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## **SUMMARY**

PBF catch size data from the Mexican purse seine operation in 2011 and 2012 is presented. The size information was taken with stereoscopic cameras during pen transfer operations to the permanent feeding pens. This allows us to have a better picture of the selectivity of the fleet (specially the one associated to farming operations in the Baja California Peninsula in Mexico). The information presented in this document confirms that the selectivity has shifted upwards since 2002. The data presented here shows a furcal length mean of 83 cm for 2012 and 109 cm for 2013.

## **INTRODUCTION**

In this paper we present an update on PBF size composition for the Mexican tuna purse seine fishery focusing on catching tuna for farming purposes. Catching PBF in the case of Mexico was opportunistic in the earlier periods of fishery development of Mexico. In part due to international difficulties to export YFT (the main objective of the Mexican fleet) and strict measures imposed on the fleet, some entrepreneurs explored the possibility of farming PBF as has been done in other parts of the world. This preliminary phase started in 1996 and the farming industry, we consider, was fully developed in 2002 (see Aires-da-Silva and Dreyfus, 2012 document presented at ISC/12/PBFWG-3/02), based on the amount of catch and the percent of it that is sent to the farming areas in Baja Peninsula. The interest on PBF also triggered some gear changes from the traditional YFT purse seine net to a deeper net that is widely used for those fishing operations which aim to catch bigger size PBF. Information on the net size is published in the "Diario Oficial" of Mexico (Mexican Government journal where all laws and agreements are published), see: Diario Oficial, 2012)

In this document we present PBF size composition data taken by stereoscopic cameras during pen transfer operations in 2012 and 2013. This technique allows to have good size composition data that was available before only with the observer sampling programs of the IATTC and Mexico PNAAPD). The accuracy of those measurements has been widely corroborated (Phillips et al, 2009) and in the case of PBF in the EPO for 2010-2011 validated through the sampling programs implemented in that region (see Aires-da-Silva and Dreyfus, 2012 document presented at ISC/12/PBFWG-3/02).

### Size data 2012-2013

In figure 1 and figure 2 box plots are presented for the 2012 and 2013 data available (median value, 25%-75% range and non-outlier range). In the latest year more variability in size composition is observed and also bigger fish were caught. Mean and Median values are very similar. Total sampling size for the above measurements is 3046 and 3400 fish respectively for 2012 and 2013.

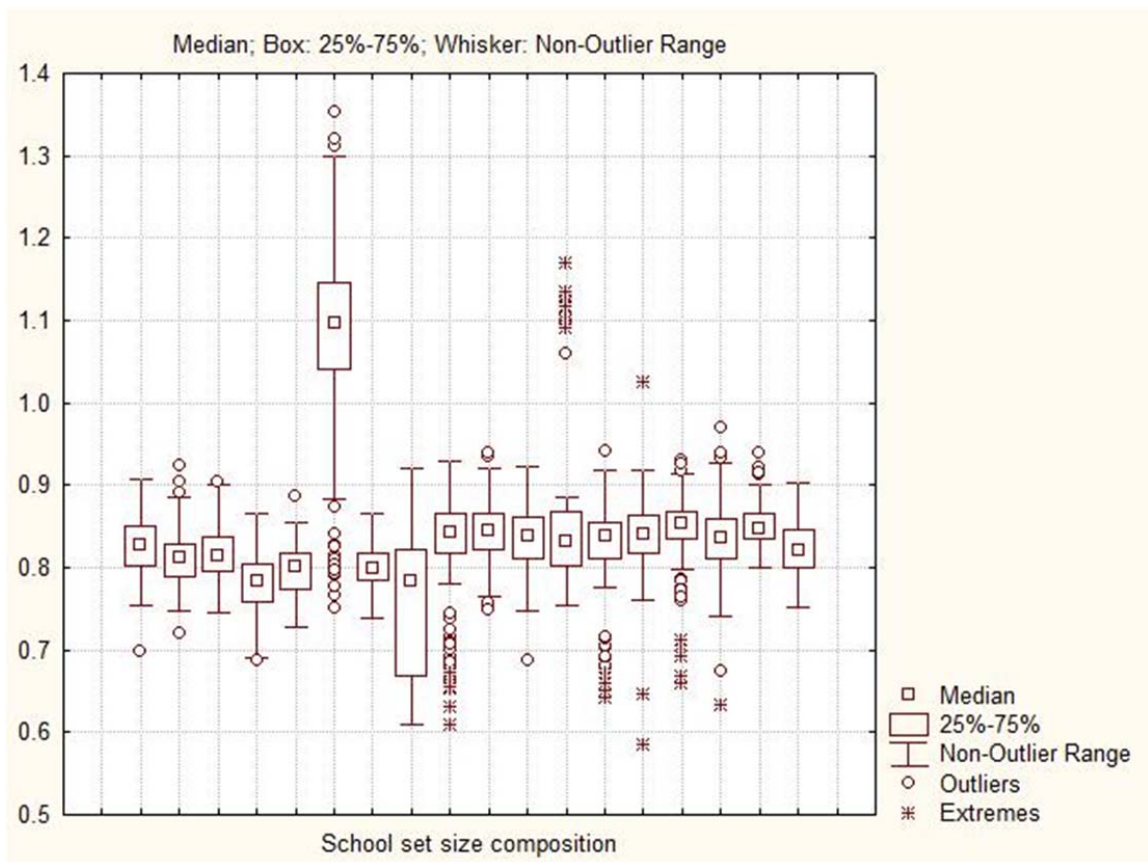


Figure 1. General statistics from the size data available from 18 pen transfer operations in 2012.

More detailed statistics from each transfer is presented in tables I and II. The smallest tuna detected in 2012 measured 58 cm, the biggest 116 cm and in 2013 the range is from 69 cm to 161 cm. Except for a few fish schools, it seems that in each particular school the size range is relatively narrow.

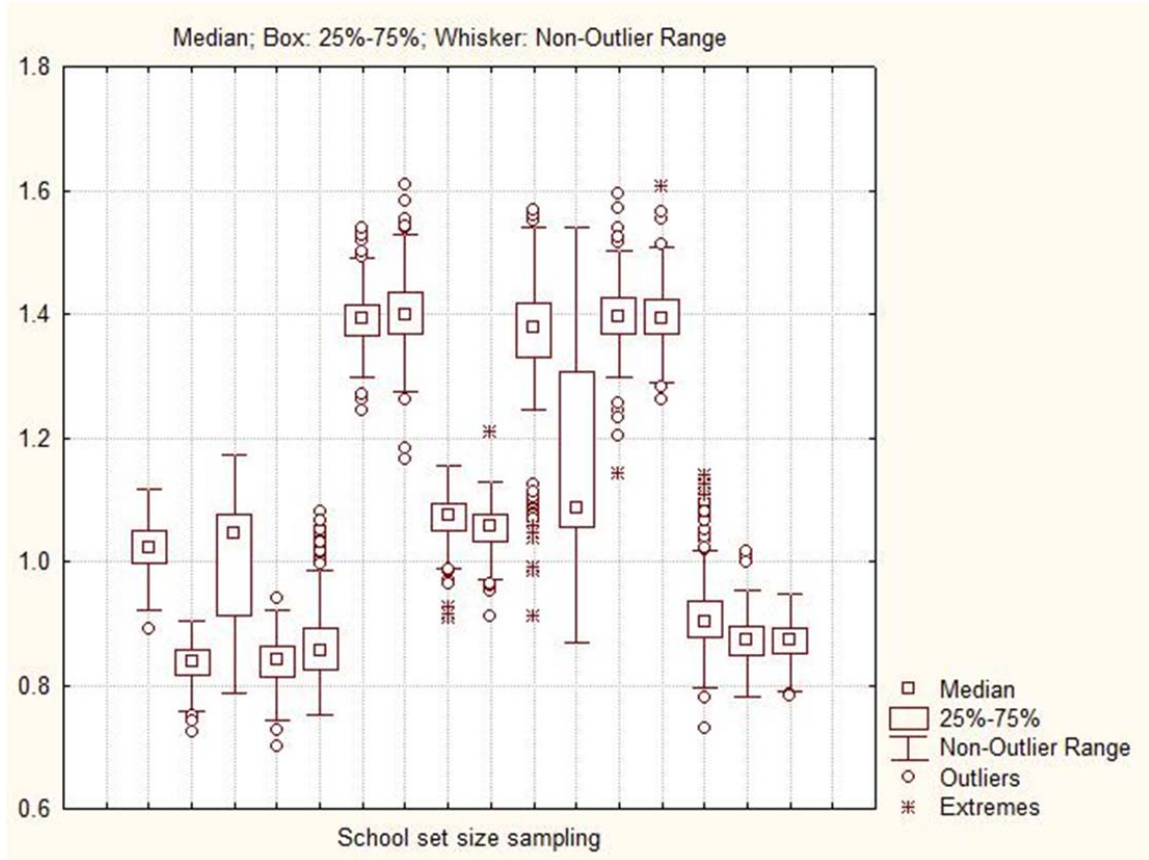


Figure 2. General statistics from the size data available from 18 pen transfer operations in 2013.

Table I. Statistics from 18 PBF pen transfers in 2012

Mean	0.82507209	0.81056086	0.81766802	0.78156066	0.79730254	1.06786975	0.8005422	0.75264786	0.82924935	0.84383696	0.83632104	0.87366166	0.82394958	0.83907998	0.84794419	0.83587551	0.85028401	0.82004863
Median	0.8275595	0.811411	0.8145595	0.7840145	0.80138	1.097995	0.798712	0.784448	0.843379	0.8446875	0.837814	0.8319595	0.8376065	0.8417245	0.854816	0.83698	0.847881	0.8205855
SD	0.03402201	0.03211279	0.02972902	0.03027787	0.03823066	0.14531014	0.02968853	0.08242977	0.05949164	0.03443236	0.0336443	0.11555327	0.05617626	0.04158636	0.03831944	0.04134632	0.02403662	0.03198646
N	150	200	200	200	37	100	44	203	240	220	200	70	200	200	200	200	182	200
MIN	0.698584	0.720483	0.745871	0.687956	0.72735	0.751003	0.7392	0.608975	0.609308	0.748776	0.688098	0.7544	0.640943	0.585547	0.659782	0.632581	0.799254	0.752242
MAX	0.908331	0.924176	0.904021	0.866705	0.886749	1.35251	0.866334	0.920769	0.92895	0.939951	0.923309	1.16947	0.940839	1.02421	0.931413	0.968943	0.939966	0.903036
25%	0.801198	0.78973	0.7963325	0.759012	0.773787	1.040325	0.7841795	0.669371	0.818414	0.8227945	0.8109925	0.802666	0.8107225	0.8171605	0.836263	0.810551	0.835879	0.799314
75%	0.850065	0.8289205	0.83801	0.8042735	0.81718	1.145735	0.818508	0.823037	0.865072	0.8651085	0.86151	0.867187	0.8553535	0.862881	0.8676195	0.8587835	0.86631	0.846045

Table II. Statistics from 16 PBF pen transfers in 2013

Mean	1.02189594	0.83412924	1.00961986	0.83772942	0.87306179	1.39427095	1.40571895	1.06826608	1.05322115	1.34987358	1.15374601	1.3973311	1.3964255	0.9215387	0.87092199	0.86967603
Median	1.023485	0.8372745	1.046655	0.8402905	0.8557595	1.393105	1.39768	1.074725	1.0578	1.379495	1.08589	1.39571	1.392445	0.9034715	0.873501	0.8719155
SD	0.03855431	0.03440236	0.089488	0.03963894	0.07369462	0.04623603	0.06595642	0.03945623	0.03663541	0.12324996	0.15194967	0.05804044	0.05063905	0.07029465	0.0373361	0.03267885
N	200	200	200	200	200	200	200	200	200	200	400	200	200	200	200	200
MIN	0.890451	0.723646	0.788428	0.699895	0.751001	1.24389	1.16611	0.907317	0.912196	0.910293	0.867948	1.14083	1.26135	0.73007	0.78235	0.783203
MAX	1.11667	0.904579	1.17201	0.939597	1.08119	1.53923	1.6093	1.15371	1.20892	1.56707	1.54043	1.59545	1.60514	1.13806	1.01527	0.94822
25%	0.997199	0.817178	0.9131515	0.812415	0.823562	1.36584	1.36717	1.05093	1.03343	1.330235	1.05453	1.3684	1.366695	0.878902	0.8476535	0.850006
75%	1.04906	0.858433	1.075935	0.8630805	0.8920985	1.416265	1.434755	1.092225	1.07617	1.41803	1.30564	1.42565	1.423185	0.934663	0.894282	0.8910465

More general information, all size information for those particular years is presented in figure 3 and 4. The mean furcal length is 83 cm for 2012 and 109 cm for 2013.

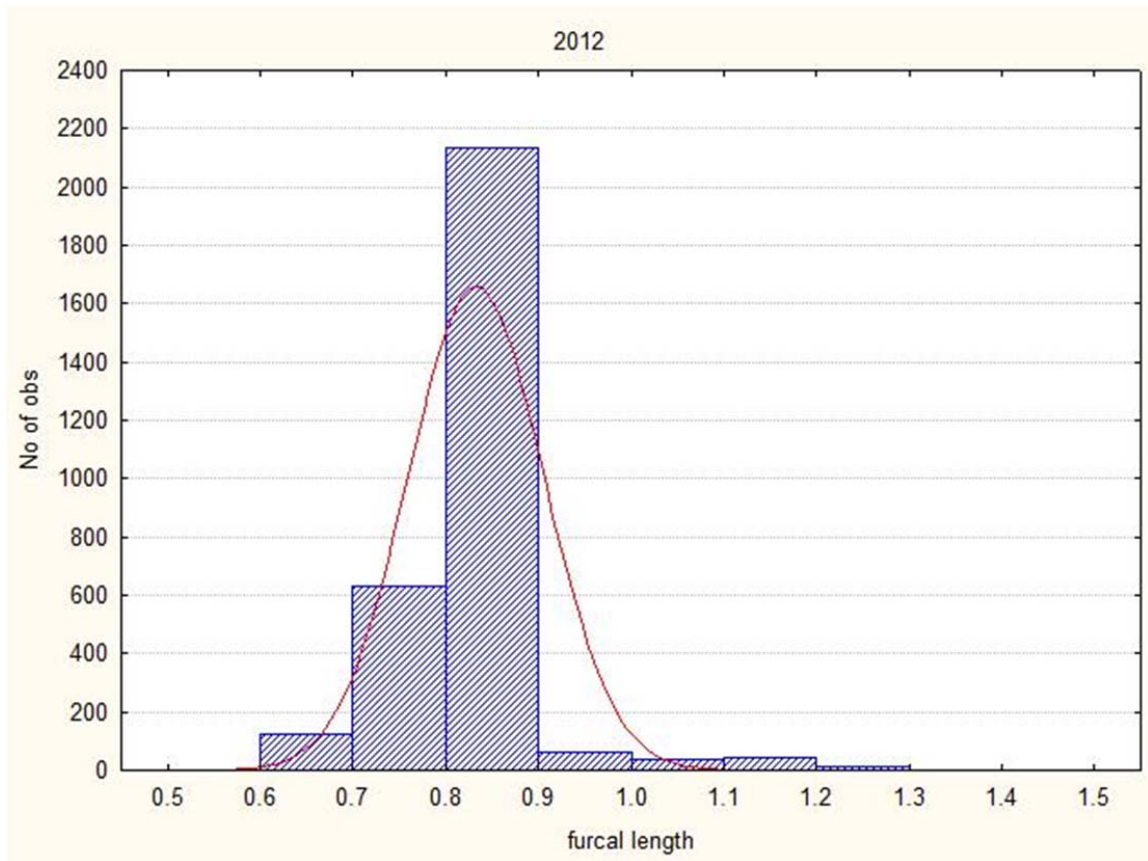


Figure 3. Size distribution for all 3046 PBF fish measured in 2012.

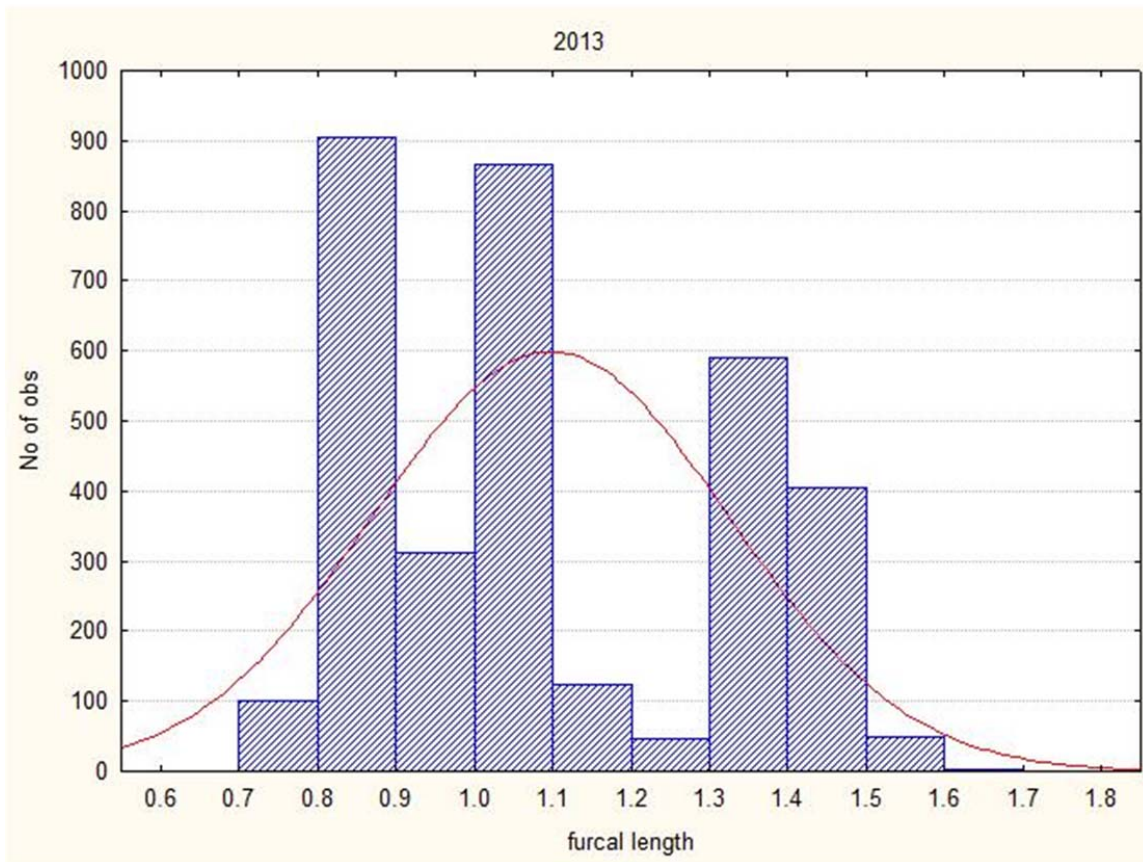


Figure 4. Size distribution for all 3400 PBF fish measured in 2013.

## CONCLUSIONS

The data analyzed and presented confirms previous assumption that selectivity for the Mexican purse seine fishery targeting PBF for farming purposes has shifted upward since 2002.

## **REFERENCES**

Aires-da-Silva, A. and M. Dreyfus. 2012. A critical review on the PBF length-composition data for the EPO purse seine fishery with new data collected at Mexican PBF pen rearing operations. Working document submitted to the ISC Pacific bluefin tuna Working Group, International Scientific Committee for Tuna and Tuna-Like Species in the North Pacific Ocean (ISC), 10-17 November 2012, Honolulu, Hawaii, USA.

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