



PBF catch size-composition of the Mexican purse seine fishery from data collected at pen rearing operations during 2018-2019

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Summary

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An analysis of the PBF catch size-composition data for 2018 and 2019 fishing seasons is presented based on length measurements taken from stereoscopic underwater cameras during pen transfer operations of live PBF tuna. PBF average size for the 2018 was 136 cm furcal length and in 2019, 123 cm. The biggest modes in 2018 and 2019 are located in 158 cm and 114 cm respectively.

Introduction

Information related to size composition has been presented to PBFWGs in the past, Aires-da-Silva and Dreyfus, 2012, Dreyfus and Aires-da-Silva, 2014, Dreyfus and Aires-da-Silva, 2015 where a statistical method was used for the first time to raise sample sizes from stereoscopic underwater cameras during PBF transfers from transportation pens to feeding pens. In Dreyfus, 2018 and now the same methodology is applied to obtain size composition of the Mexican catch from 2015 to 2017 and 2018 and 2019 correspondingly.

During recent years, collaborative efforts between INAPESCA-Mexico and the PBF fishing industry generated access to PBF size-composition data collected during pen transfer operations. Stereoscopic cameras have been introduced in the bluefin ranch sector and are utilized to obtain counts of fish and estimates of individual fish lengths, as well as weight composition data, under at-sea transfer conditions. This state-of-the-art technology provides a large volume of high-quality length-frequency data (Phillips et al, 2009).

PBF size composition estimates for 2018-2019

A summary of the PBF data available for this study are presented in Table I. Sampling effort is shown with respect to the number of sets from where size data was collected. More sampling effort was conducted in the 2019 fishing season, as compared to the 2018 fishing season, considering percent of total sets sampled (table I).

Table I. Sample size for the 2018-2019 fishing season

	% of sets sampled	Total number of sets
2018	35.70%	28
2019	100%	13

Raising to total catch

Available PBF size-composition data were raised to total catch using the equation below:

$$N_{ik} = (n_{ijk} * C_{jk} / S_{jk}) * R_k$$

where

N_i is the estimate of the number of fish in size bin i for year k . i

= size bin (2cm bins from 60cm to 160 cm)

j = sampled set

k = year

n = # fish measured in a set

C = catch per set sampled (tons)

S = amount in tons of fish measured in a set

R = total PBF catch in year k / $\sum C_{jk}$ (where the sum is over j)

Results

In figure 1 the location of all the effort for 2018 fishing season is presented. The area is located in the northern part of Baja California peninsula where in recent years all the fishing activities are situated for logistical reasons.



Figure 1. Fishing area for PBF in Baja California, Mexico in 2018

The raised PBF size compositions of the Mexican purse-seine fishing operations from 2015 to 2019 are presented in Figure 2, to keep track of fluctuations with previous years. The size range (minimum and maximum size measured) is shown in table II, some slight differences are detected. By contrast size composition and age classes present in the catch can have important differences year by year.

In 2015 season, two modes are present in the catch, dominated by 110 cm PBFs and a smaller fraction of some relatively larger PBF (> 140 cm) were captured but fish > 140 cm did not appear in large numbers in the catch of year 2016 when fish predominantly of 116 cm were captured and in contrast in 2017 considerable larger animals were captured of 134 cm and 160 cm modes. PBF average size for the 2018 and 2019 fishing seasons were 136 cm and 123 cm. There are two main modes each year. In 2018 one at 114 cm the second and largest in 158 cm. For 2019, the first one and principal is located in 114 cm and the second one in 142 cm.

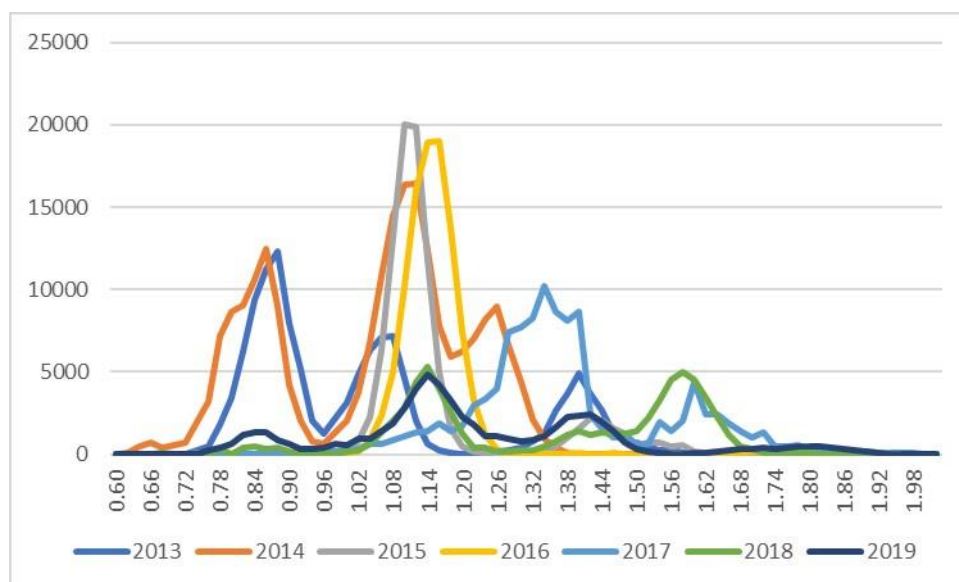


Figure 2. PBF size composition from the Mexican purse seine fishery in the EPO, 2015-2019

The range of sizes as well as average size of PBF in Mexican catch is shown in table II.

Table II statistics from PBF measured

	2018	2019
Minimum size	68 cm	76 cm
Maximum size	194 cm	202 cm
Average size	136 cm	123 cm

References

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