Size distribution of Pacific bluefin tuna, *Thunnus orientalis* caught by Korean offshore large purse seine fishery

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Introduction

In Korean waters, most Pacific bluefin tuna, *Thunnus orientalis* (PBF) are caught by offshore large purse seine in the sea around Jeju Island, and in the Yellow Sea and in the East Sea as well (NFRDI, 2002; Yoo et al., 2012; Shin et al., 2018).

At last meeting, it was discussed that the size distributions of Korean purse seine (Fleet 3) were different from those of Japanese purse seine (Fleet 2), and suggested that Korean purse seine fleet (Fleet 3) be separated from Fleet 2.

In this study, PBF size data collected from Korean offshore large purse seine were summarized and raised to represent population size.

Data and Methods

PBF size data used in this study were measured by researchers and observers at Busan Cooperative Fish Market where most PBF caught by Korean purse seine are uploaded and a laboratory of the National Institute of Fisheries Science (NIFS). The measurements were recorded in fork length and weight in 1 cm and 1kg interval, respectively. Samples transported to the laboratory were measured fork length, weight, and were extracted otolith, gonad, muscle and tissue for the Close Kin study.

PBF size data have been collected since 1996, but data before 2003 were not used in this study because they were not enough for analyzing.

Sample size data were raised to represent population size. For that we categorized the size group into “large” of 30 kg or more and “small” of under 30 kg, and weighted size distribution based on the category as follows,

$$\mathrm{TN} = \sum_{i=n}^{m} SN_i w_S + \sum_{j=n}^{m} LN_j w_L$$

where, TN is the estimate of the total number of catch for the quarter, SN_i is the number of sample of length class i for small size, LN_j is the number of sample of length class j for large size, w_S and w_L are weightings that are divided sampled catch by nominal catch for small and large size, and n and m are the minimum and the maximum size sampled for each size group.

Results and Discussion

Figs. 1 and 2 represent the distributions of fork length of PBF caught by Korean offshore large purse seine fishery, which are not raised (Fig. 1) and raised (Fig. 2) based on the catch of small and large size, respectively. Those figures show similar distributions between them, but in 2004 the frequency of large size decreased from the raised distribution.

Fig. 3 represents the frequency of PBF length by quarter, which showed that the large size was commonly caught in quarter 1 and 2.

References

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Yoo, J.T., Z.G. Kim, S.I. Lee, I.J. Yean, S.C. Yoon and D.W. Lee. 2012. Recent update of Pacific bluefin tuna catch in Korean waters. ISC/12-1/PBFWG/19.

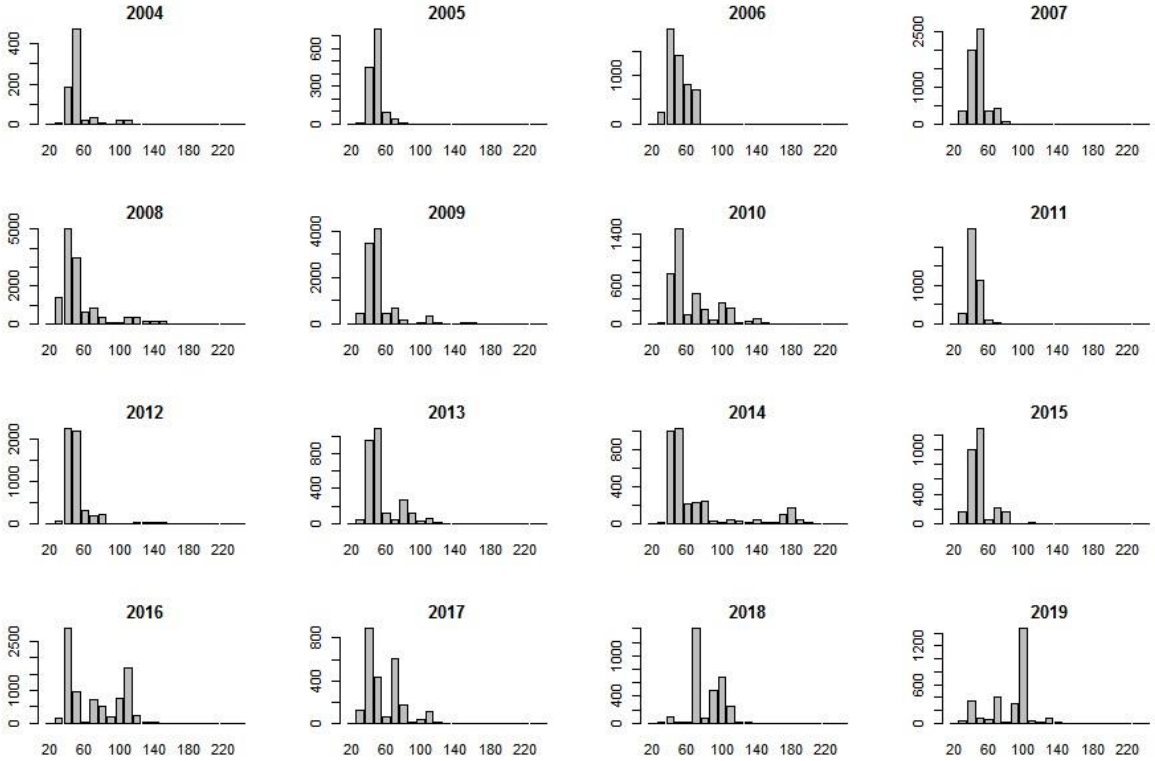

Fig. 1. The distributions of raw fork length of PBF caught by the Korean offshore large purse seine fishery.

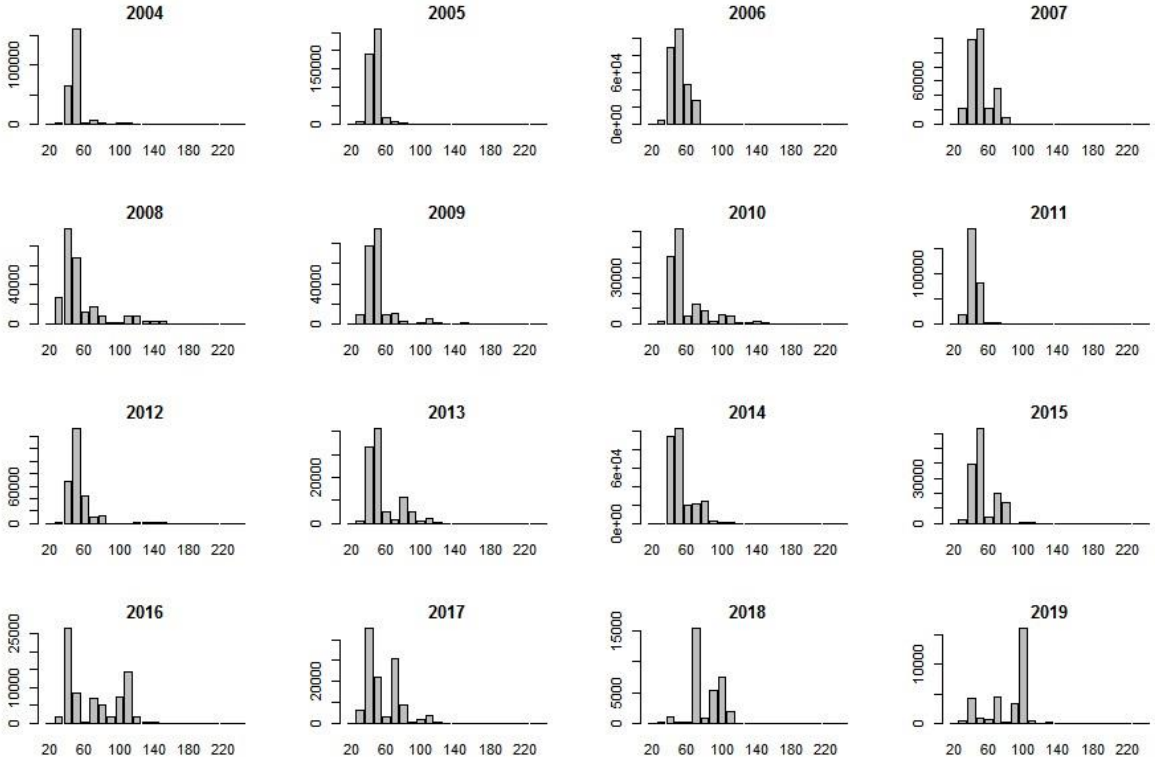

Fig. 2. The distributions of fork length of PBF caught by the Korean offshore large purse seine fishery, which were raised based on the catch of small and large size.

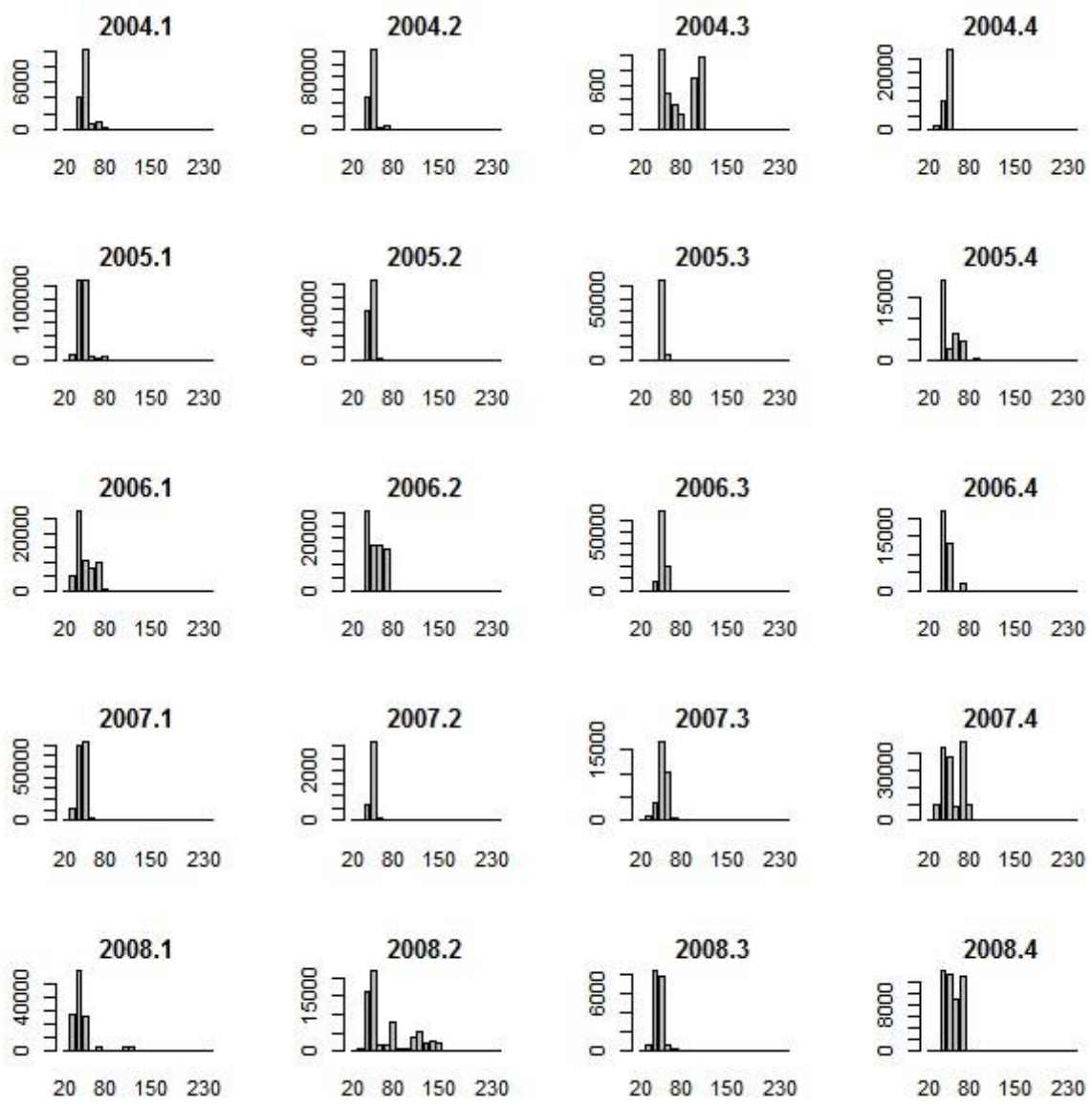

Fig. 3. The quarterly distributions of fork length of PBF caught by the Korean offshore large purse seine fishery, which were raised based on the catch of small and large size.

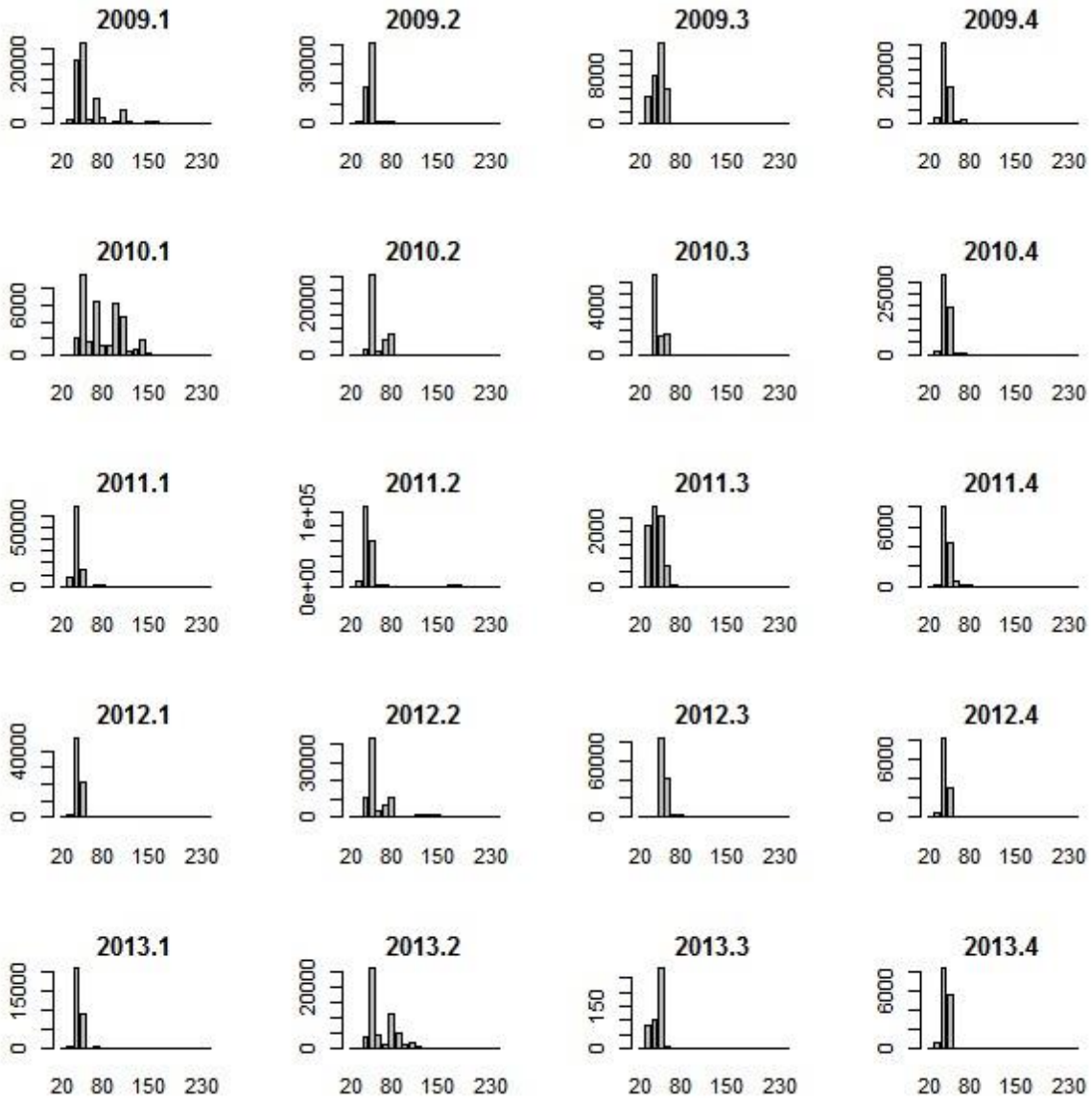

Fig. 3. Continued.

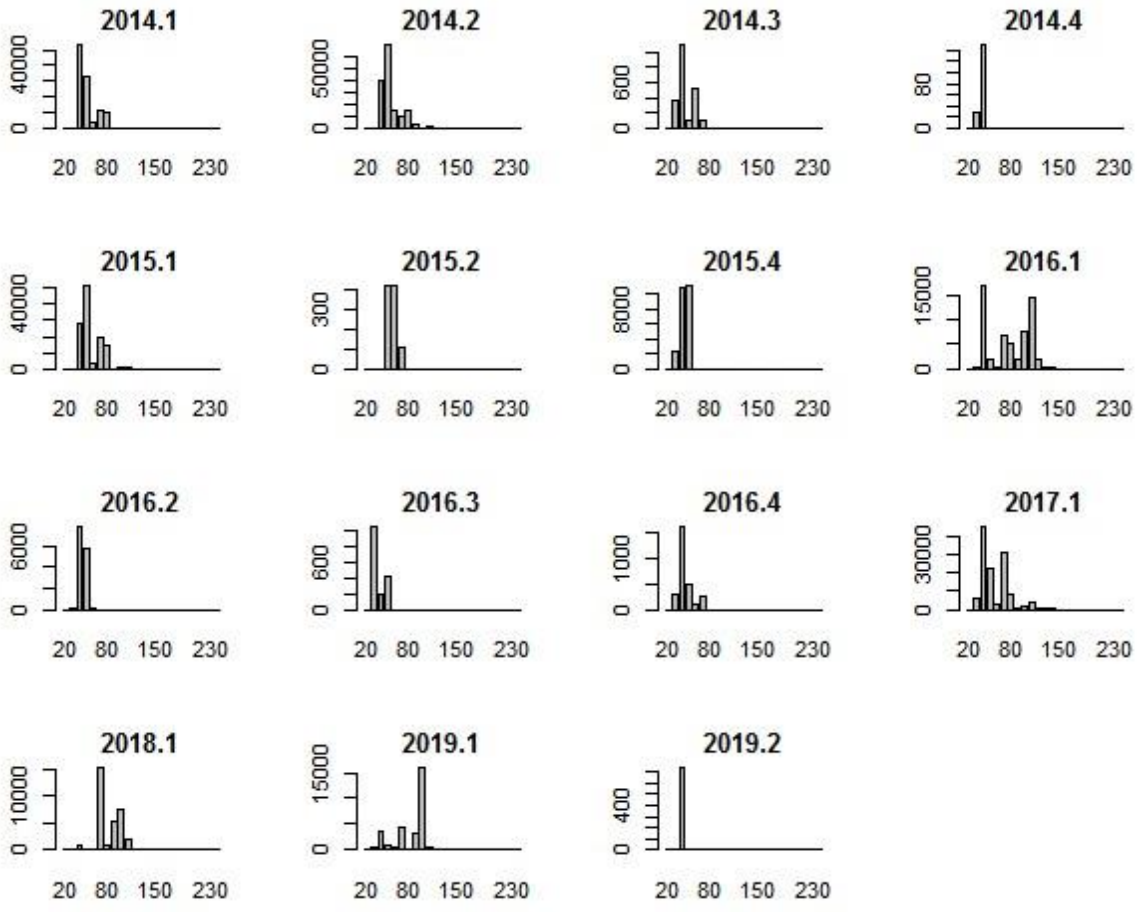

Fig. 3. Continued.