



**Update of Korean fisheries information for Pacific bluefin
tuna, *Thunnus orientalis***

Mi Kyung Lee, Sung Il Lee, Youjung Kwon and Junghyun Lim

National Institute of Fisheries Science
216, Gijanghaean-ro, Gijang-eup, Gijang-gun, Busan, 46083, Rep. of Korea

April 2021

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), from 20 to 23 and 27 April 2021, Webinar.

Summary

Total catch of Pacific bluefin tuna in 2019 and 2020 are 581 ton and 605 ton caught by offshore large purse seine, trawl and set net fisheries in the Korean waters, and catch proportion of set net has been increasing in recent years. The proportion of large PBF recorded at the highest of 68% of the total catch. It mostly caught by purse seine fishery during March to April in the southern and eastern part of Jeju island. Most PBF were caught around Jeju island same as usual, and some of PBF were caught by set net, which are located along the coast of East Sea. As for the PBF size, large size of PBF has increased since 2016 and is mainly caught in 1st and 2nd quarter. In 1st quarter 2020, the fish larger than 100 cm were much caught than previous years.

Introduction

Pacific bluefin tuna (*Thunnus orientalis*, PBF) mostly has been caught by Korean offshore large purse seine fishery (hereafter 'purse seine fishery', Fleet 3 for stock assessment) which targets pelagic species such as mackerels and squids around the Jeju island (Yoon et al., 2012). It is also caught by set net and trawl fisheries in the Korean waters. For monitoring and managing of fisheries associated with PBF, the Ministerial Directive on conservation and management for PBF stock put established on 26 May 2011, since then it has been strengthened through several revisions. This document describes the updated Korean fisheries information and size data related to PBF.

Fishery information

Catch and effort

Total catch of PBF was the highest with about 2,6000 ton in 2003, thereafter it has been decreased with annual fluctuations. The PBF catches of 2019 and 2020 were 581 ton and 605 ton, respectively. The number of vessels belonging to the purse seine fishery has been continuously declined, and recorded the lowest of 18 in 2020 (Fig. 1).

As for the purse seine fishery, the PBF catches of 2016 and 2017 were exceeded the allocated catch due to an unexpected huge amount of catch caught by most purse seine vessels at once only for one or two days. Accordingly, the excessive catch has been paybacked on a schedule of 5 years from 2017. The catch by purse seine fishery of 2019 and 2020 were 542 ton and 567 ton, respectively. Due to its strict management led by Korean Government, the purse seine fishery only caught around 80% of their PBF quota in 2020.

Although the catch by purse seine fishery accounted for most of the total PBF catch, those of other fisheries, especially set net fishery, are getting more catch proportion for recent years. Set net fishery has reported PBF catch since 2013, and the amount and proportion of catch by set net fishery were around 35 ton and 6% in both 2019 and 2020. The catch by trawl fishery has been decreasing from 2017, the catch was below 3 ton in 2020 (Fig. 2).

Most PBF caught by Korean fisheries in the Korean waters were small fish less than 30kg in weight. However, the large fish have been increased since the late 2000s, and the proportion

highly recorded at 46% in 2016 and 68% in 2020. In 2020, large PBF were mainly caught by purse seine and trawl fisheries in March to April, and a little amount of large fish were caught by set net fishery in January (Fig. 3).

Fishing distribution

PBF are mainly caught around Jeju island by purse seine fishery during March to April. In recent years, particularly in 2019 and 2020, PBF were caught by set net fishery along the coast of East Sea all the seasons, and the catch has increased accordingly. In 2020, it was also caught in the West Sea by trawl fishery. Therefore, the fishing ground was further extended in 2020 (Fig. 4). Most large fish were caught in the southern and eastern part of Jeju island.

Size data

PBF size data were measured by researchers and observers at Busan Cooperative Fish Market where most PBF are unloaded from purse seine fishery. The size data have been collected since 1996, but data before 2003 were not used due to low data coverage. The size data were weighted based on the amount of large and small PBF catch (Lee et al., 2020). Fig. 5 and 6 represent the distributions of fork length of PBF from purse seine fishery by year and by year-quarter, respectively, suggesting that the large size has increased since 2016 and is mainly caught in 1st and 2nd quarter. In 1st quarter 2020, the fish larger than 100 cm were much caught than previous years (Fig. 6).

The relationship between length (FL) and weight (BW) was $BW = 0.00002FL^{2.9733}$ ($R^2 = 0.99$) (Fig. 7)

References

- Kim DN, Lee MK, Lee SI and An DH. 2019. Update of Korean fisheries information for Pacific bluefin tuna, *Thunnus orientalis*. ISC/19/PBFWG-2/03.
- Lee SI, DN Kim, MK Lee and HJ Jo. 2020. Size distribution of Pacific bluefin tuna, *Thunnus orientalis* caught by Korean offshore large purse seine fishery. ISC/20/PBFWG-1/06.
- Yoon SC, ZG Kim, SI Lee, MK Lee and DW Lee. 2012. Catch characteristics and resources management of Pacific bluefin tuna caught by offshore large purse seine in Korean waters. ISC/12-3/PBFWG/09.

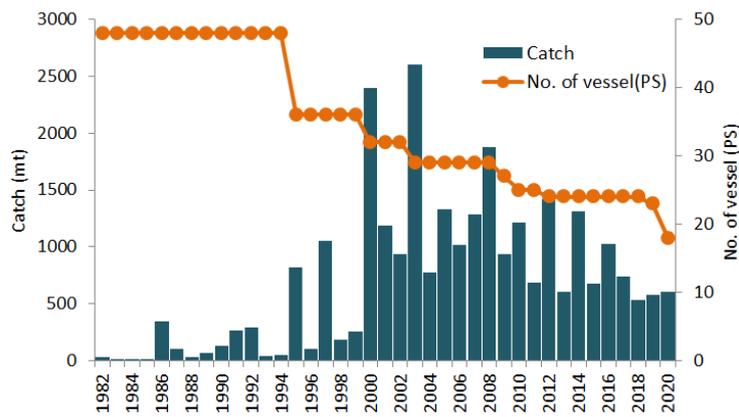


Fig. 1. Total catch of PBF and number of vessels belonging to Korean offshore large purse seine fishery, 1982-2020.

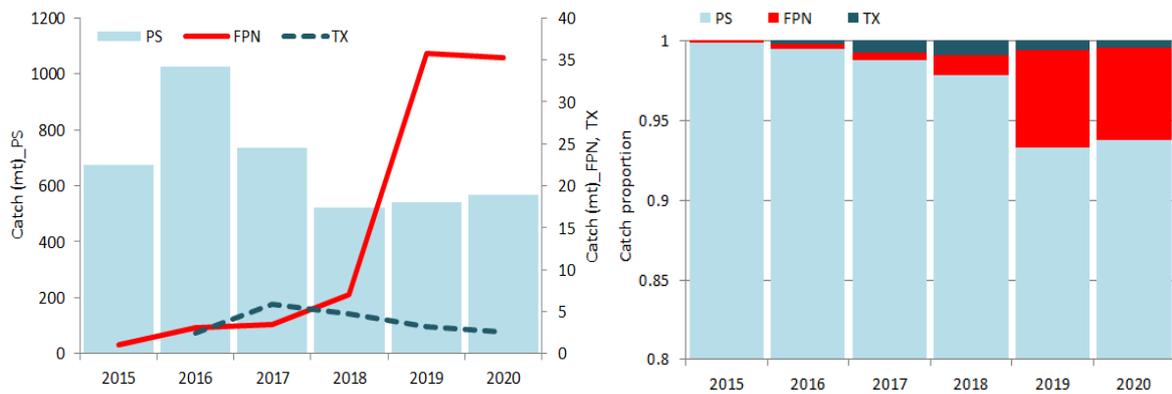


Fig. 2. PBF catch (left) and its proportion (right) by fishery, 2015-2020 (PS: purse seine, FPN: set net, TX: trawl).

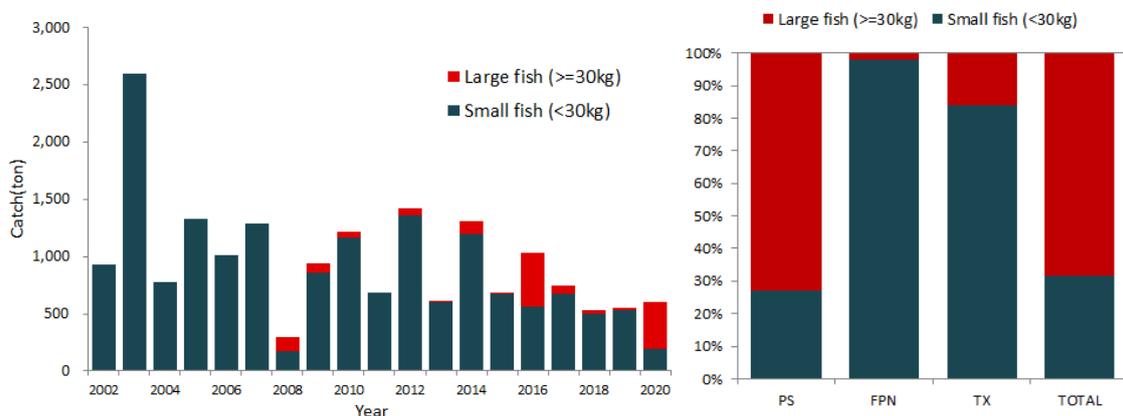


Fig. 3. PBF catch from 2002 to 2020 (left) and its proportion by fishery (right) in 2020 by size.

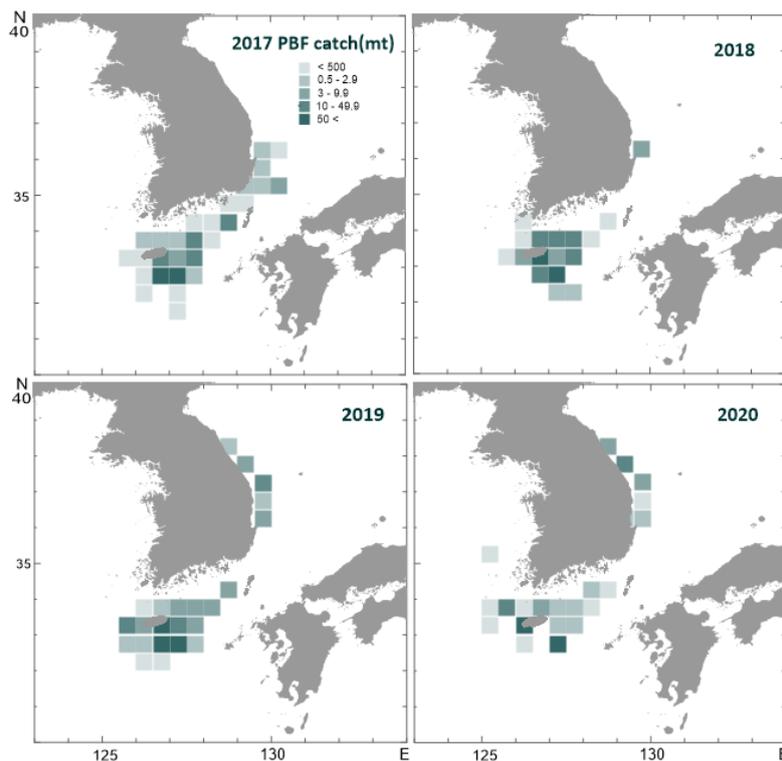


Fig. 4. Catch distribution of PBF caught in the Korean waters, 2017-2020.

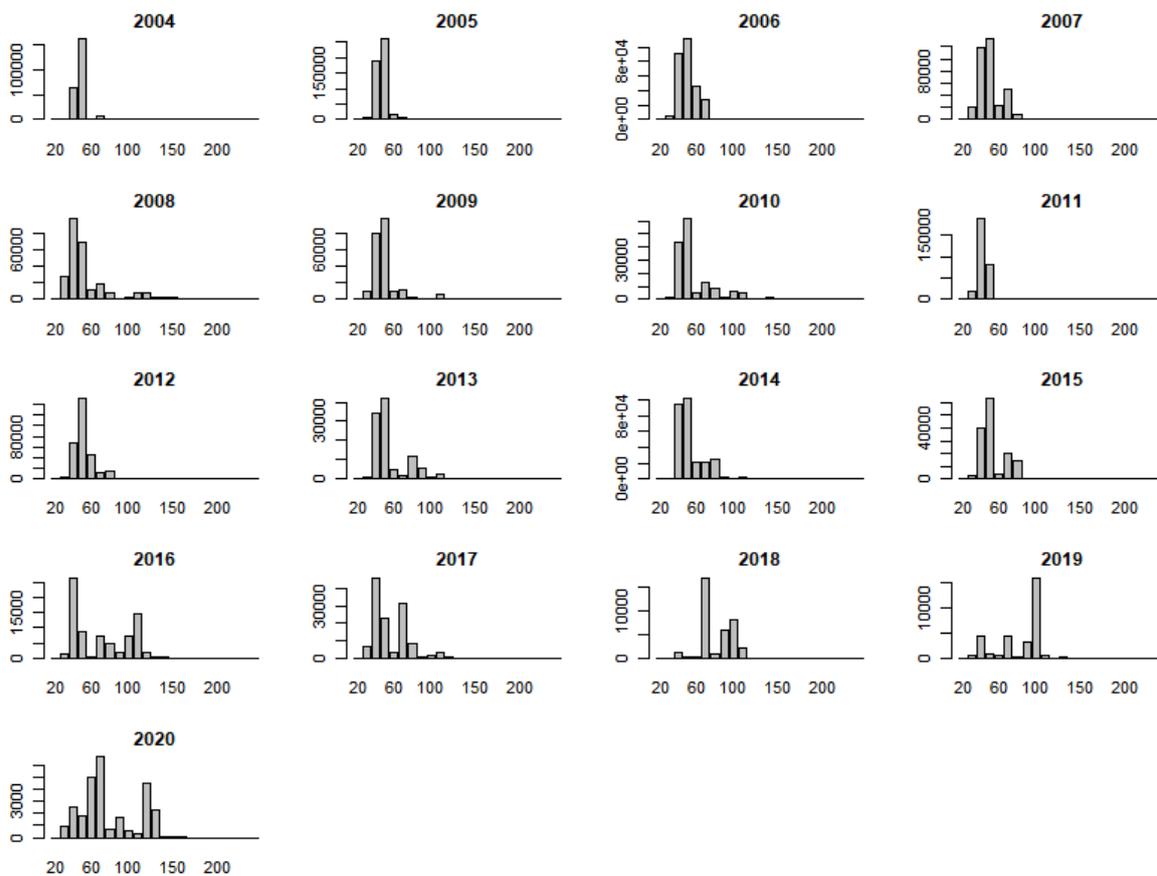


Fig. 5. The distributions of fork length of PBF from the Korean offshore large purse seine fishery by year, 2004-2020.

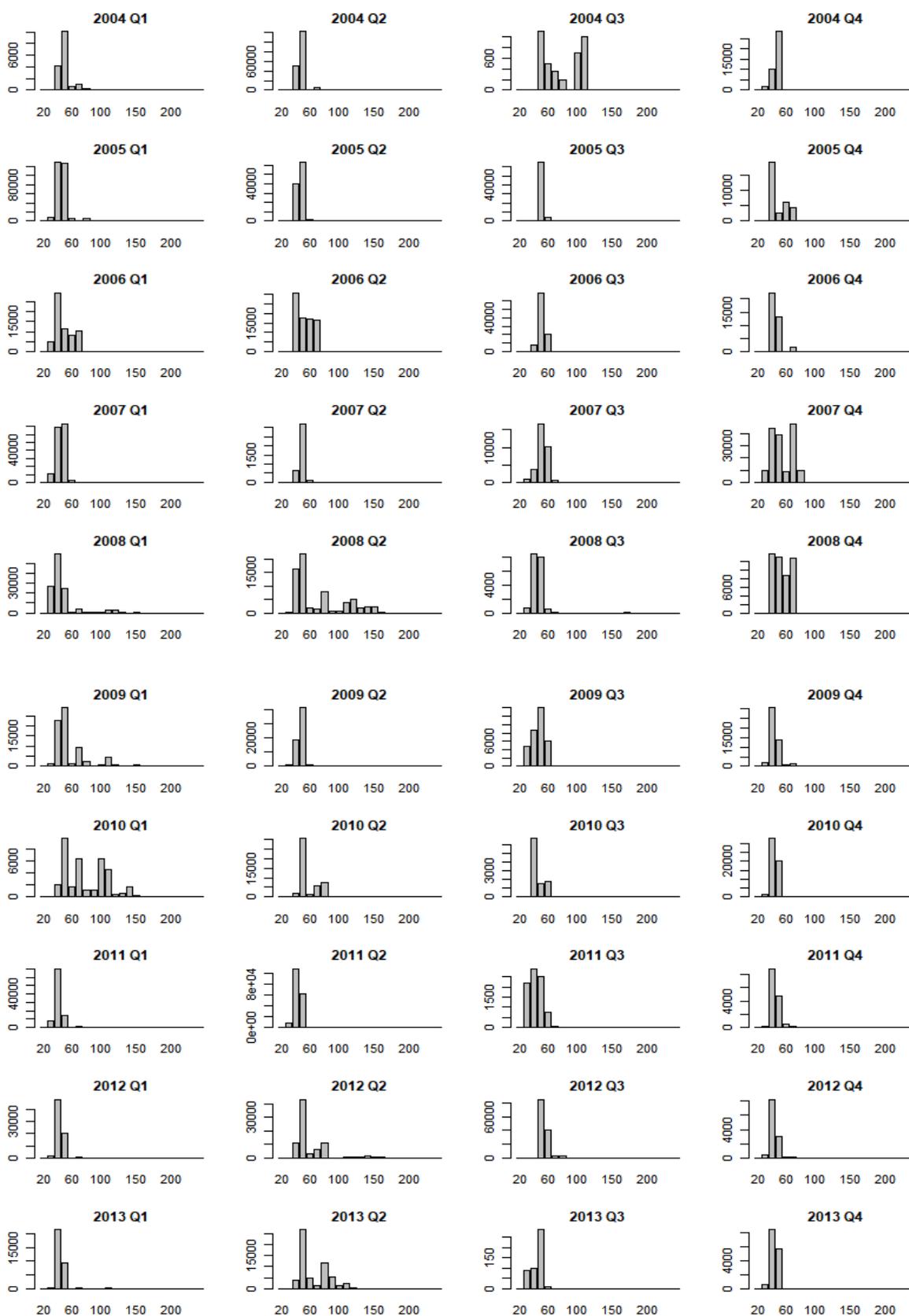


Fig. 6. The distributions of fork length of PBF from the Korean offshore large purse seine fishery by year-quarter.

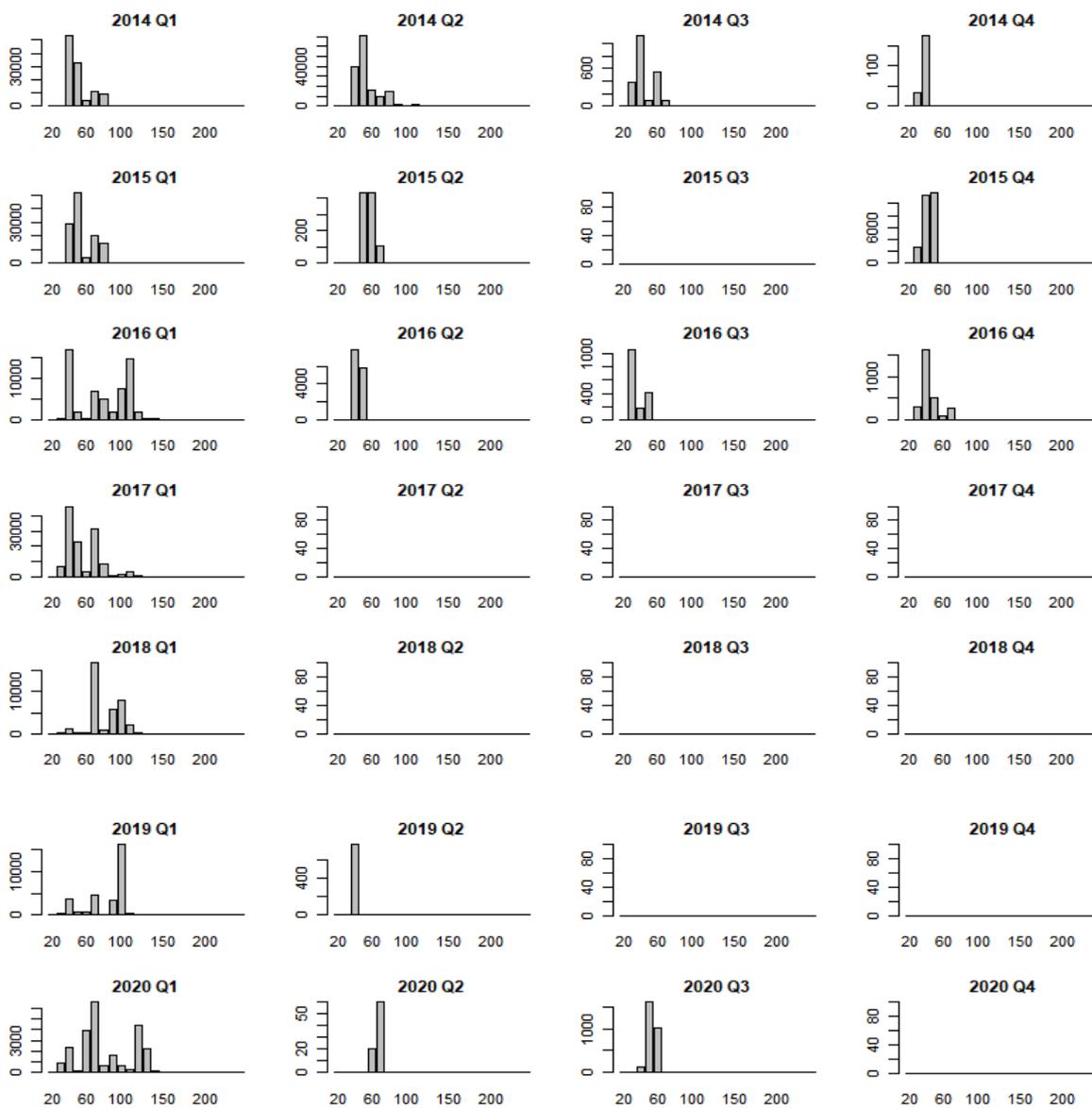


Fig. 6. Continued.

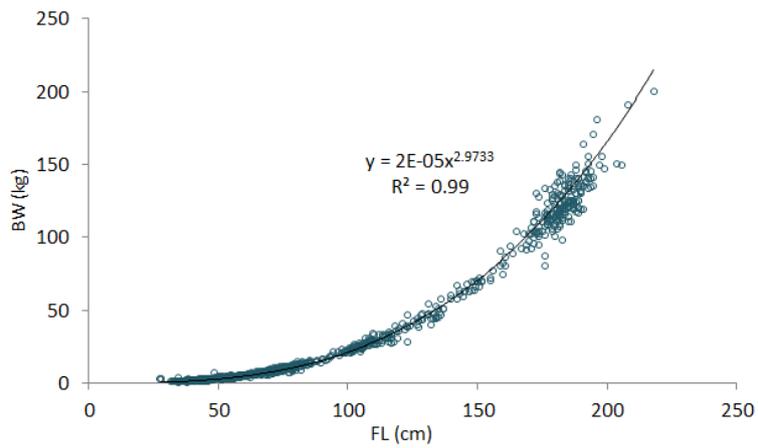


Fig. 7. Length-weight relationship of PBF caught in the Korean water.