



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

Doo Nam Kim, Mi Kyung Lee, Sung Il Lee and Doo Hae AN

Distant Water Fisheries Resources Division,
National Institute of Fisheries Science

216, Gijanghaean-ro, Gijangeup, Gijang-gun, Busan 46083, Rep. of Korea

November 2019

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 18 to 23 November 2019, La Jolla, CA, USA.

Summary

The catch of Pacific bluefin tuna in 2018 and 2019 are 535 ton and 567 ton caught by offshore large purse seine, trawl and set net fisheries in the Korean water, and catch by set net fishery has been increasing in recent years. Most Pacific bluefin tuna were caught around Jeju island during the first quarter, and some of PBF were caught by set net, which are located along the east coast all the seasons of the year. The mean length and predominant range of Pacific bluefin tuna are gradually increasing.

Introduction

Pacific bluefin tuna(PBF) mostly has been caught by Korean offshore large purse seine fishery (hereafter 'purse seine'), which targets pelagic species such as mackerels operating 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 report provides the updated Korean fisheries information on PBF.

Fishery information

Catch and effort

The catch of PBF was the highest with 2,000 ton in 2003, thereafter it has been decreased with annual fluctuations. The PBF catches of 2018 and 2019 (up to 31 September 2019) were 535 ton and 567 ton, respectively. The number of vessels belonging to the purse seine fishery has been continuously declined from 48 to 23. (Fig. 1). The PBF caught by purse seine fishery accounted for about 95% of total PBF catch in Korea, and only small portion of PBF were caught by other fisheries such as set net and trawl. 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 trawl fishery has a steady trend around 4 ton compared to other fisheries.

Set net fishery has been reported PBF catch since 2013, and the catch by this fishery showed increasing trend, especially in 2019. Both purse seine and trawl fisheries were already shut down under the Ministerial Directive, whereas set net fishery still remain their quota, so the catch by set net fishery are expected to increase further more this year (Fig 2).

Fishing distribution

PBF were mainly caught around Jeju island by purse seine fleets during the first quarter (January to March). And some of PBF were caught by set net, which are located along the east coast all the seasons of the year (Fig. 3).

Most large PBF were caught in the southern and eastern areas of Jeju island, main PBF fishing ground, however, the proportion of large PBF shows very high in the Gangwon Province in 2019 (Fig. 4).

Size data

Figure 5 shows the length frequency distribution of PBF for the recent 10 years. The mean length varied from year to year; however, it generally has been increasing recently. The mean length and predominant length range ('mode') of 2019 were 88.7 cm and 100-110 cm, which are the highest mean length and mode of PBF caught in the Korean waters.

The comparison of length frequency distribution by fishery was shown that the mean length caught by purse seine fishery is a little bit higher than that by set net. The length mode of purse seine fishery was 100-110 cm and followed by 90-100 cm, and that of set net fishery was 80-90 cm and followed by 90-100 cm (Fig. 6).

The relationship between length (FL) and weight (BW) was $BW = 0.00002FL^{2.9659}$, $R^2 = 0.9903$ (Fig. 7).

Age of PBF caught in 2019 was estimated to convert from length data using the growth equation of Fukuda (2015) and most of age was 2.0-2.5 years and followed by 1.5-2.0 years (Fig. 8).

References

Fukuda et al.(2015) Estimates of growth function from length-at-age data based on otolith annual rings and daily rings for Pacific bluefin tuna. ISC/15/-2/PBFWG/#11.

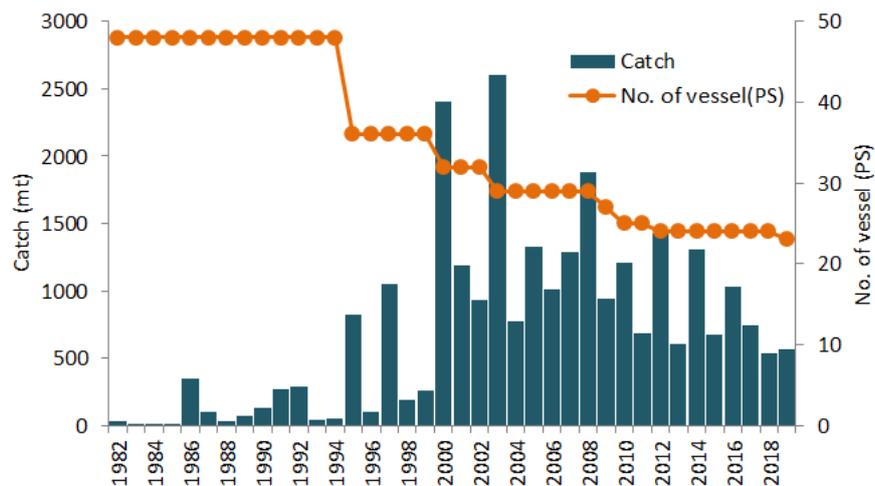


Fig. 1. Total catch of Pacific bluefin tuna and number of vessels belonging to Korean offshore large purse seine fishery, 1982-2019.

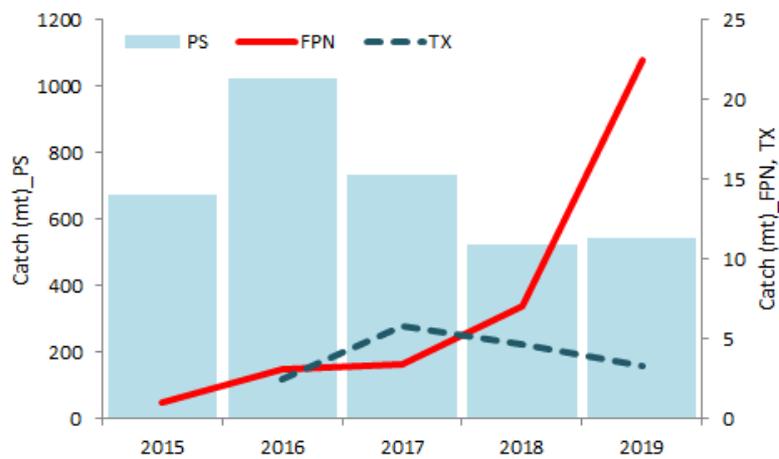


Fig. 2. Catch of Pacific bluefin tuna by fishery (purse seine, set net, trawl), 2015-2019.

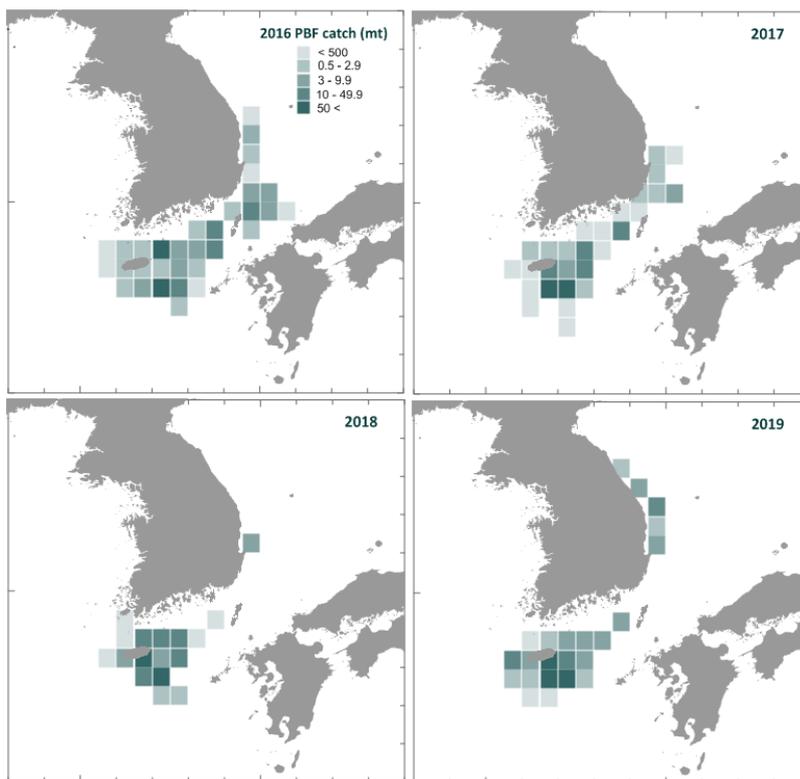


Fig. 3. Catch distribution of Pacific bluefin tuna caught in the Korean water, 2016-2019.

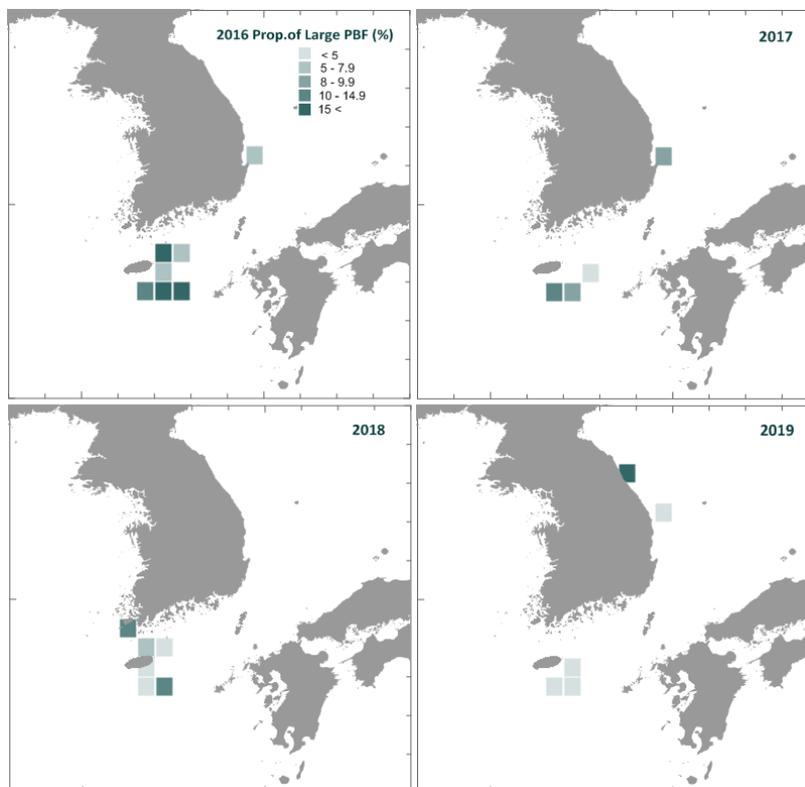


Fig. 4. Distribution on catch proportion of large Pacific bluefin tuna caught in the Korean water, 2016-2019.

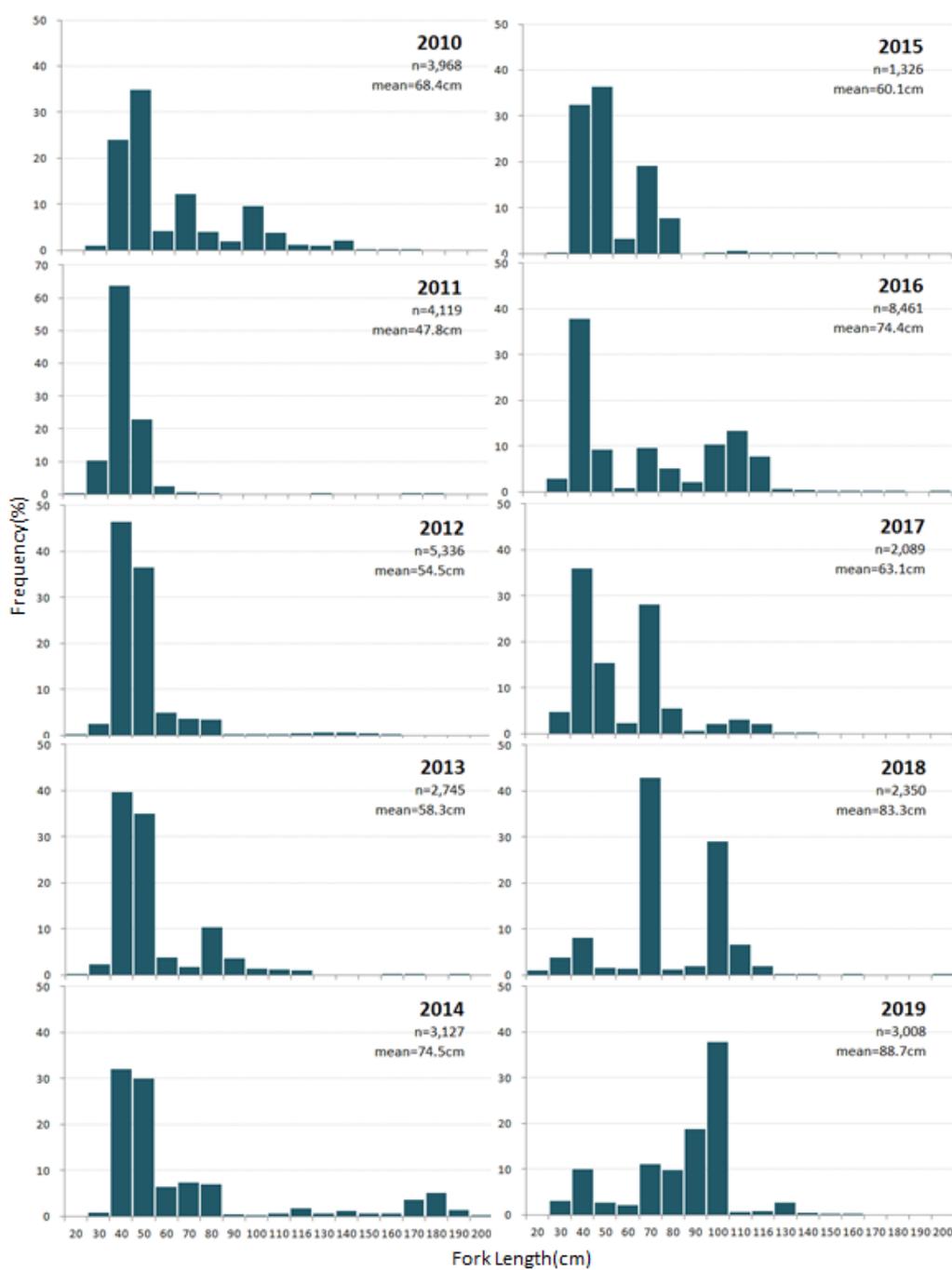


Fig. 5. Length frequency distribution of Pacific bluefin tuna caught in the Korean water, 2010-2019.

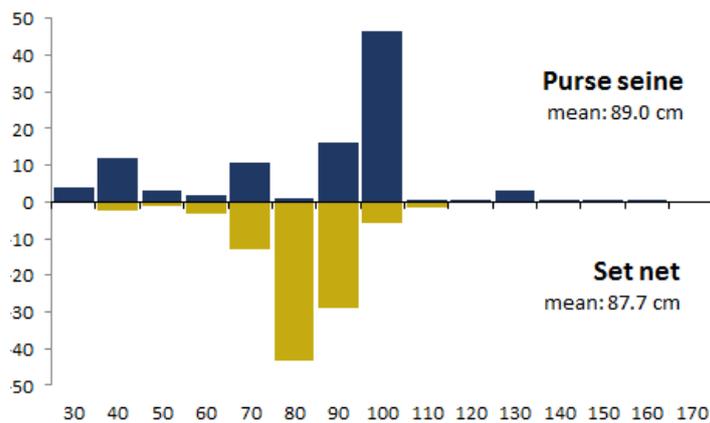


Fig. 6. Comparison on length frequency distribution of Pacific bluefin tuna between purse seine and set net fisheries in 2019.

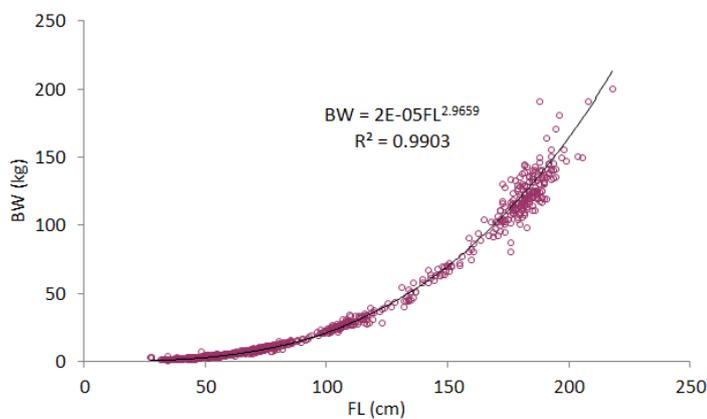


Fig. 7. Length-weight relationship of Pacific bluefin tuna caught in the Korean water, 2009-2019.

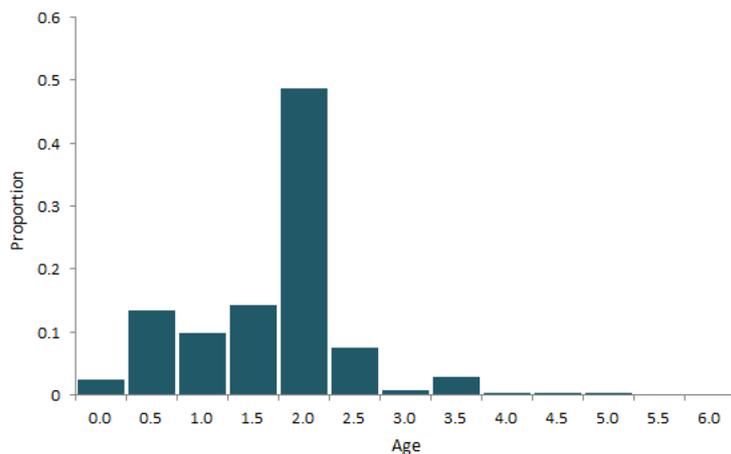


Fig. 8. Estimated age frequency distribution of Pacific bluefin tuna caught in the Korean water in 2019.