North Pacific Fisheries Commission

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Submitted by Japan

Japan Chub Mackerel Stock Assessment

Abstract

Japan is sharing four domestic stock assessments - blue mackerel (IP03), chub mackerel (IP04), Japanese flying squid (IP05), and Japanese sardine (IP06) for information sharing purpose.

2nd Floor Hakuyo Hall,
Tokyo University of Marine Science and Technology,
4-5-7 Konan, Minato-ku, Tokyo
108-8477, JAPAN

TEL +81-3-5479-8717
FAX +81-3-5479-8718
Email secretariat@npfc.int
Web www.npfc.int

Chub mackerel (Pacific stock)

Chub mackerel is widely distributed around Japan, with Pacific stock occurring in the Pacific Ocean. Fishing year used in this report starts in July and ends in June of the following year.

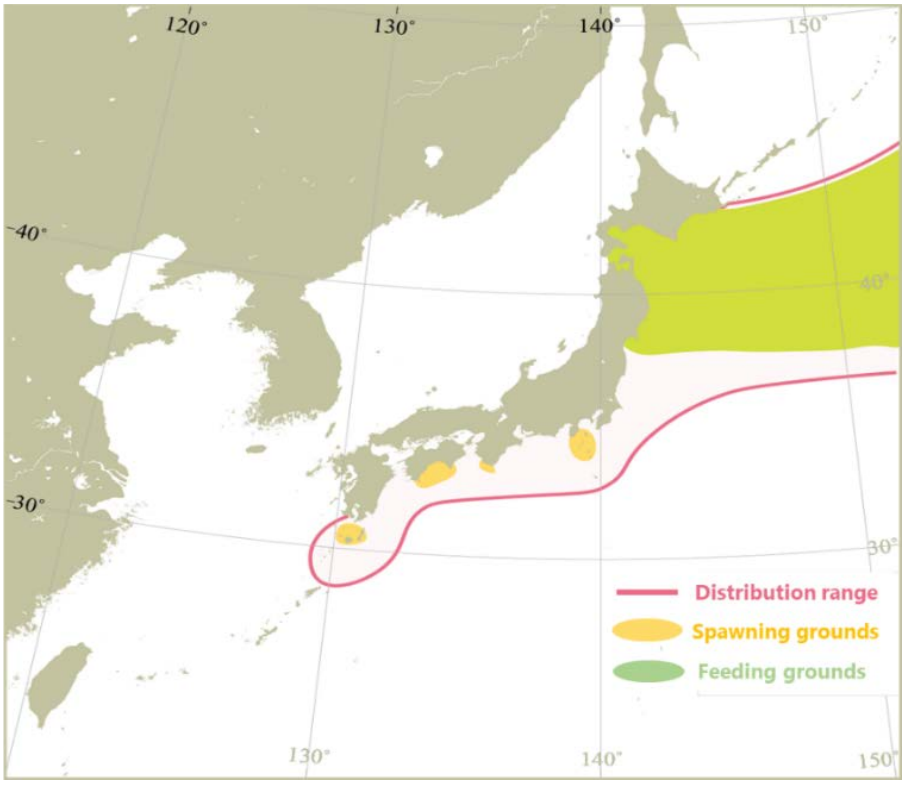

Figure 1 Distribution

Chub mackerel is widely distributed along the Pacific coast of Japan. Its spawning grounds form around the Kuroshio Current off the southern coast of Japan.

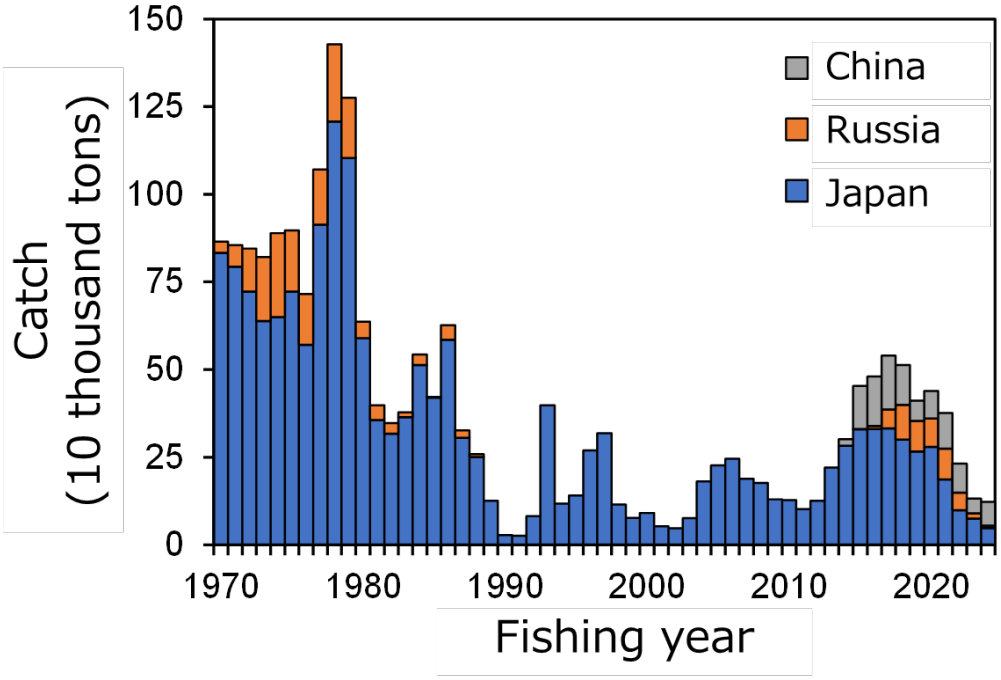

Figure 2 Total catch by country

Japan's catch remained high in the 1970s, declined in the 1980s, and stayed at a lower level in the 1990s and 2000s. It increased after the 2012 fishing year, but began decreasing after the 2020 fishing year, declining to 48 thousand tons in the 2024 fishing year. In the 2024 fishing year, catches by Chinese and Russian vessels were 68 thousand and 7 thousand tons, respectively. The total catch in the year was 123 thousand tons.

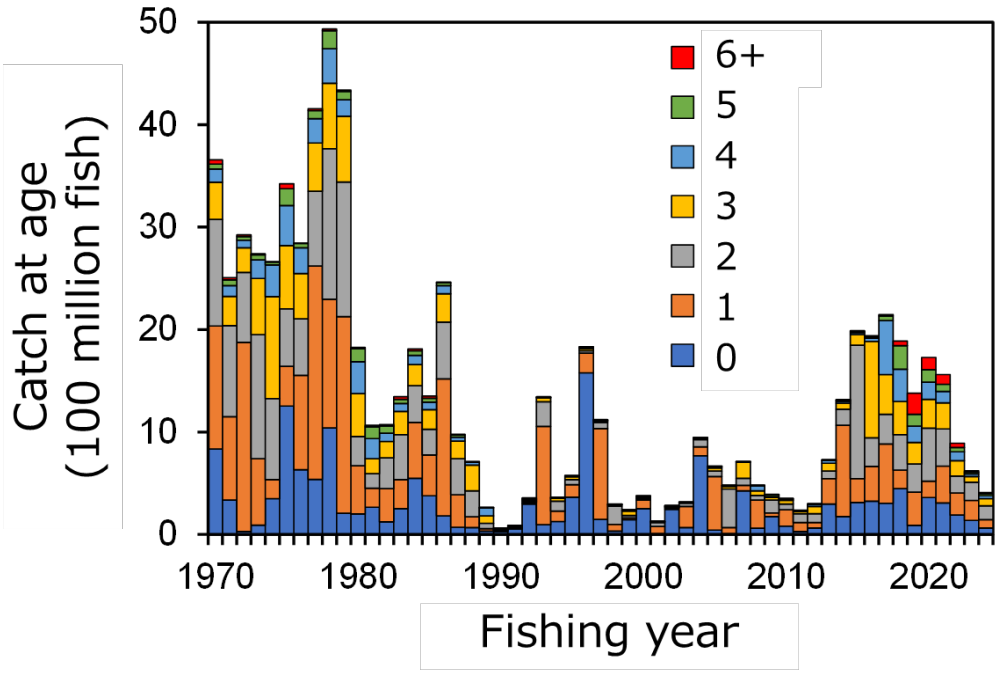

Figure 3 Catch at age
Catches of age-0 and age-1 fish were dominant, but the proportion of fish aged 2 and older increased during the 2015–2020 fishing years. The proportion of age-0 and age-1 fish were increased after 2019.

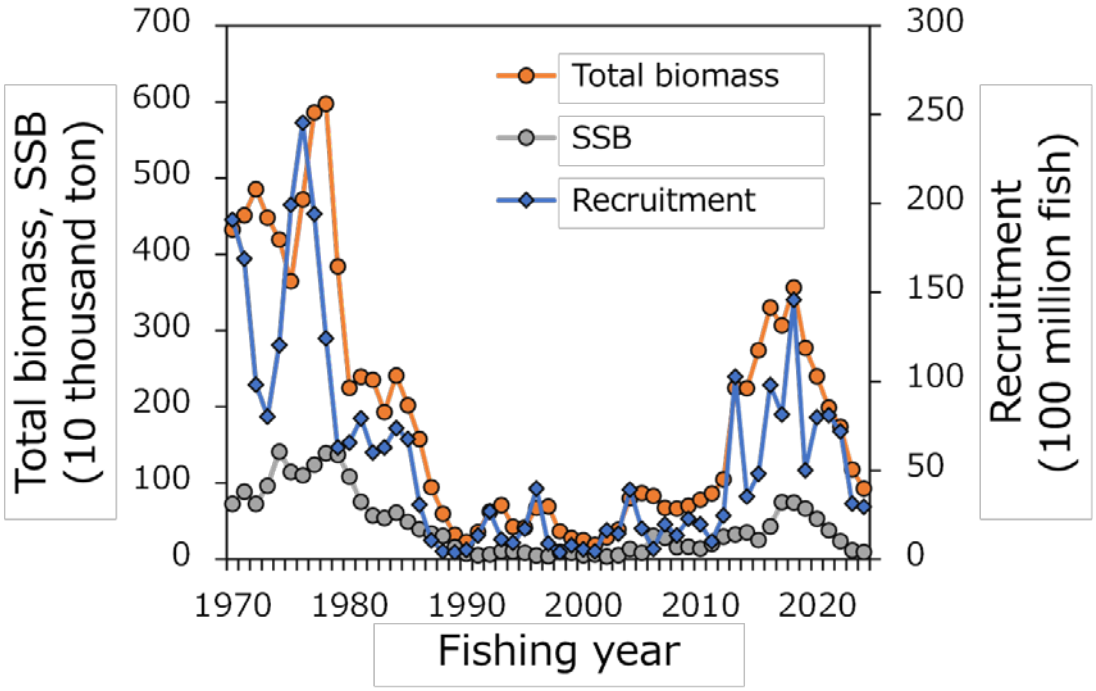

Figure 4 Trends in total biomass, spawning stock biomass (SSB), and recruitment
The total biomass remained at a higher level in the 1970s, declined sharply during the 1980s, and stayed at a lower level during the 2000s. After a sudden increase in the total biomass in the 2013 fishing year, it fluctuated at a medium level up to the 2018 fishing year. It declined again after the 2018 fishing year, dropping to 930 thousand tons in the 2024 fishing year. SSB followed a similar trend, increasing in the 2017 fishing year. It showed a decreasing trend over the last five years (2020–2024), dropping to 97 thousand tons in the terminal year. Recruitment (numbers at age 0) was high in the 2013 and 2018 fishing years, whereas it showed a decreasing trend since the 2019 fishing year.

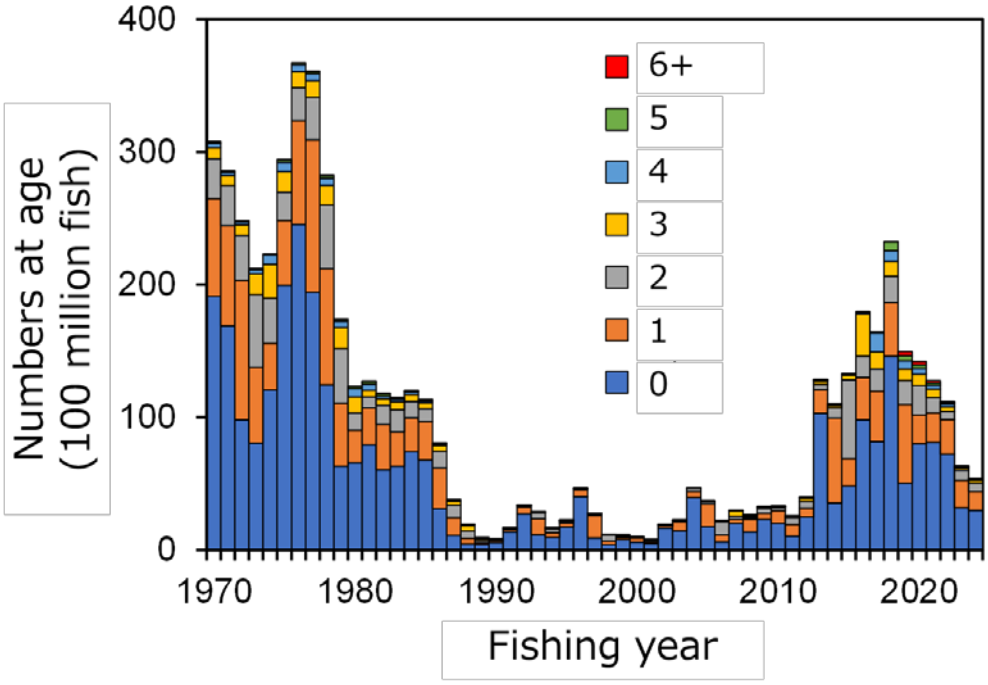

Figure 5 Numbers at age

The age composition of the stock is primarily made up of age-0 and age-1 fish, with a low proportion of fish aged 2 and older.

Table 1 Reference points, estimated values and total catch

Given the high uncertainty in biological parameters, maximum sustainable yield (MSY)-based reference points were not applied to this stock. F50%SPR was employed as the proxy for Fmsy for this stock. The proxy of SSBmsy, adopted as the target reference point (TRP), was estimated at 482 thousand tons, with the proxy for maximum sustainable yield (MSY proxy) of 233 thousand tons under F50%SPR. The limit reference point (LRP) was set at 10% of the pristine spawning stock biomass under a no-fishing mortality scenario, corresponding to 142 thousand tons. The fishery closure threshold (SSBban) was tentatively set at 0 tons.

TRP	LRP	SSBban	SSB in 2024	MSY proxy	Total catch in 2024
482 thousand tons	142 thousand tons	0 tons	97 thousand tons	223 thousand tons	123 thousand tons

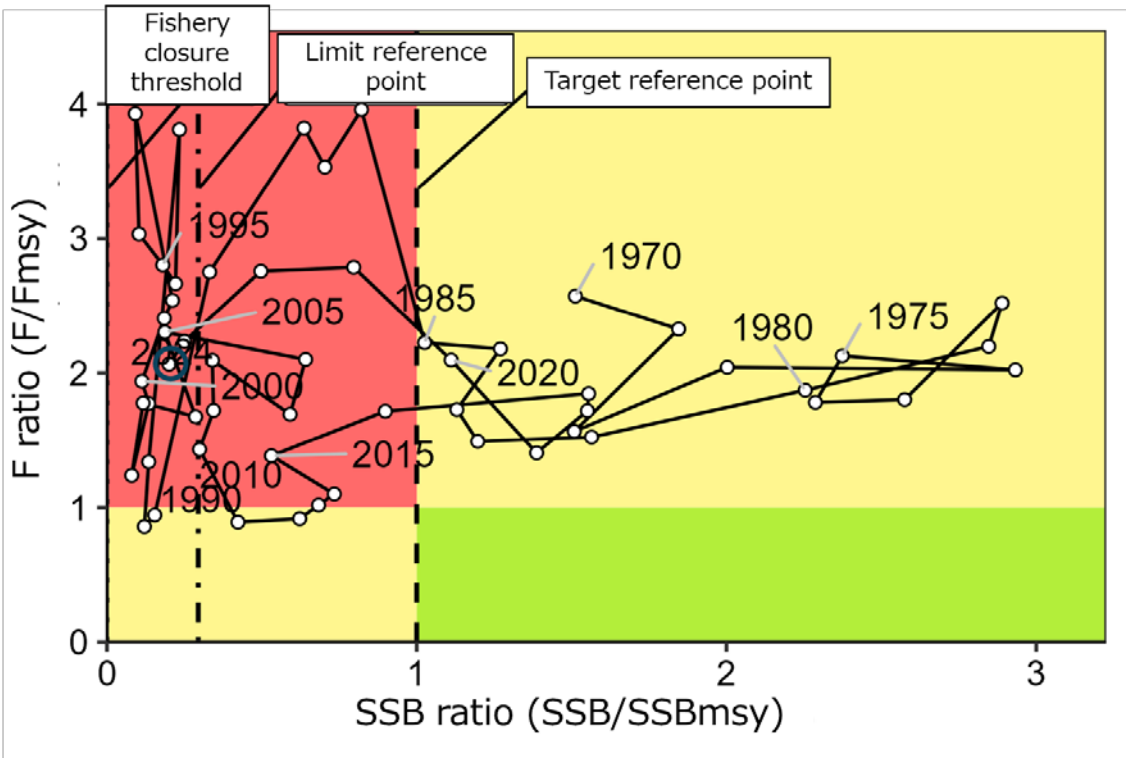

Figure 7 Kobe plot

Fishing mortality (F) exceeded Fmsy in all years except for the 1990, 1991, 2011, and 2012 fishing years. F ratio (F/Fmsy) for the 2024 fishing year was 2.07. SSB was below SSBmsy throughout the time series, except for the 1970–1981 and 2017–2019 fishing years. SSB ratio (SSB/SSBmsy) for the 2024 fishing year was 0.20.