

Possible effect on longline operation resulted from the 2006 changes in Japanese SBT  
fishery regulation

2006年に実施された日本のミナミマグロ漁業管理システム変更に伴う日本延縄  
船の操業への影響

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### 要約

2006年に水産庁は、延縄船におけるミナミマグロの管理システムを変更し、各船への漁獲枠配分となり、漁期制限がなくなった。操業の質的・質的变化に伴って、CPUEへの影響は正負両方が想定され、複雑である。正確な資源評価を実施するためには、日本のミナミマグロ漁業から得られる情報を慎重にモニターし解釈するほうが良い。また、豪州の巻き網漁業や、豪州、韓国、インドネシア、南ア、台湾のはえ縄漁業を通じて複数の信頼できる資源指標を得ていくことが有益である。

### Summary

Japanese regulation system for SBT fishery was changed in 2006. It becomes no restriction for fishing season and area and individual quota is introduced. Possible effects on CPUE resulted from the new regulation are complicated; some are positive and the others are negative. From a point of view of conducting accurate stock assessment, it would be better to carefully monitor and interpret information from Japanese longline fishing. Furthermore, it would be beneficial to develop reliable indices of stock from the data in purse seine fisheries of Australia and in longline fisheries of Australia, Korea, Indonesia, South Africa and Taiwan, as well as the data from scientific researches.

### Introduction

CPUE information from the Japanese longline fishery is essential in CCSBT for stock assessment and management of southern bluefin tuna (SBT) such as for Operating Model and Management Procedure. Therefore, it is important to ensure reliability and consistency of the CPUE series. This document discusses possible effects on longline CPUE resulted from the changes in the Japanese SBT fishery regulation in 2006.

### New regulation for the Japanese SBT fishery started in 2006

Japanese regulation system for SBT fishery was changed in 2006. Up to 2005, fishing season and the total number of vessels authorized to fish were set for each of the CCSBT area 4-9 (but not identical to

CCSBT area). Fishing operation was conducted in a first-come-first-served basis until the total catch reached the pre-determined amount for a given area. Catch in weight was reported from the each vessel every 10 days period to Fisheries Agency of Japan by radio. Fisheries Agency of Japan determined the end date of operation of the area. Inspection of catches made by these boats was conducted randomly selected at the landing ports.

In 2006, individual quota (IQ) of about 32 tons of SBT was allocated for Japanese longline vessels. This IQ is not transferable, however, it is transferable within vessels that belong to the same company. There is no restriction for fishing season and area, though the opening date was set on May 1st in 2006. Every SBT caught has to be tagged with a tag on which ID number is printed. This ID number has to be included in RTMP reporting system and reported on the next day of the fish caught with length, weight and sex information. In addition, Fisheries Agency of Japan reduced its total allowable catch for 2006 to about 4500 tons, which is 74% of the current TAC (6065 tons).

#### Possible changes in the longline operations resulted from the new regulation

By the new regulation system mentioned above, untagged SBT is not allowed to land, so that more stringent regulation could be applied. Each vessel is expected to avoid unnecessary spatio-temporal competition among vessels, and is probably able to conduct fishing operation based on its own fishing strategy.

The IQ, up to about 32 ton, is not sufficient to fish for SBT throughout year. Therefore, vessels have to fish for other tuna species as well in certain time of the year. A part of the vessels would attempt to catch SBT as soon as possible regardless of size and quality of the fish as in the past. The shorter the fishing for SBT, the longer they can allocate their fishing effort for other tuna species such as yellowfin or bigeye tunas. While they are in the SBT fishing ground, they would always consider going to other fishing ground for other tuna species. They might prefer SBT fishing ground where other tuna species are also caught or might not go to SBT area where is far from the current fishing grounds for other tuna species. If SBT catches were lower, they might leave the SBT fishing ground soon for fish other species. This makes the resulted CPUE higher. If vessels are less concentrated in a certain area, remaining vessels can select their fishing area more freely, and thus might record higher CPUE. On the contrary, from the point of view of sharing the fishing information among vessels, if the vessels are fewer and only covered a part of fishing ground, the chances to find a better fishing might be reduced, and CPUE might become lower.

On the other hand, the other vessels whose fishing ability is higher might target on SBT of better economic value (usually larger fish) in order to maximize the income, and their age selectivity might be changed or different from other boats. In this case, CPUE would become lower, especially for smaller fish. In any case, it would be difficult for us to judge whether or not the lower CPUE for young SBT is caused

by the targeting on larger fish or by the lower recruitment.

Because of no restriction for fishing season by area, CPUE data would be obtained from larger time and area, including before September in area 8 or after August in area 4-7 and 9, that has not been obtained since 1989 as these strata were kept closed. On the other hand, since the TAC is reduced to 4500 tons and there is no limitation in fishing season, the operations given to spatio-temporal strata used in recent years might be reduced. Thus, it is expected that the numbers of operations in each 5x5 degree and month cell and the number of the cell might be decreased. These operational changes need to be taken into consideration.

#### Evaluation of various influence

As mentioned above, various aspects of changes in operation have to be considered when Japanese longline CPUE are interpreted for SBT stock assessment purpose. Takahashi(CCSBT-ESC/0509/45) simulated the influence of reduction of Japanese longline effort, as well as reductions for only a part of area or season. The results were optimistic in the sense that CPUE trend could be maintained even with the reduced fishing effort of 50% or only to a part of area or months. However, there are possibilities that large and unexpected changes could have evolved from the new regulation. Therefore, careful monitoring and interpretation of CPUE is required.

It is not easy to achieve evaluation for influence on CPUE resulted from many factors, which are ambiguous, difficult to record, and difficult to quantify. If the characteristics of Japanese longline fishery change very quickly and those are not detected, we will have wrong interpretation on stock size on which the current CCSBT is heavily relying. From a point of view of conducting accurate stock assessment, it would be better to carefully monitor and interpret CPUE and the other information from Japanese longline fisheries. Furthermore it would be beneficial to gather all the available data not only from Japanese longline fisheries but also from the other countries' SBT fisheries that could be used for stock assessment of SBT. Therefore, sufficient data in quantity and quality should be collected from all fisheries other than Japanese longline, such as purse seine fishery in Australia and longline fishery in Australia, Korea, Indonesia, New Zealand, and South Africa. Of course, all of fishery data have to be obtained with transparency and objectivity.

In addition, developments of indices from scientific researches which are independent from fishery information are important. At present, the Recruitment Monitoring Program provides estimates of several indices of stock abundance, including the acoustic and trolling surveys in the Western Australia for age 1 SBT, the aerial survey in South Australia for age 2-4 SBT, as well as conventional tagging in the Scientific Research Program of CCSBT for F of purse seine. While its effectiveness should be reviewed routinely, these research efforts should be continued. In the simulation study of CCSBT-ESC/0509/45, the

influence of effort reduction over the trend of CPUE for age 4, which is the youngest age used for indexing the abundance for the Japanese longline, is relatively large and become more variable. This suggests the importance of obtaining recruitment information independent from longline fishery.

#### Reference

Takahashi, N. Preliminary analysis on effect of changes in fishing pattern on CPUE.  
CCSBT-ESC/0509/45.