THE ORGANIZATION FOR THE PROMOTION OF RESPONSIBLE TUNA FISHERIES

Sankaido Bldg. (9th Floor)
1-9-13 Akasaka, Minato-ku ,Tokyo, Japan 107-0052
Tel: 03-3568-6388; Fax:03-3568-6389
Website:http//www.oprt.or.jp

OPRT
NEWSLETTER INTERNATIONAL MAY. 2022 No. 79

FOR CONSERVATION AND SUSTAINABLE USE OF TUNAS

# This issue features translations of two short articles on bluefin tuna written by Dr. Ziro Suzuki (tuna biologist). The original of the first article will be included in OPRT Japanese Newsletter No. 114.

## 1. Recovery of the Pacific bluefin tuna stock – A dilemma for researchers

### Introduction

The Pacific bluefin tuna stock, which was once depleted, is now steadily recovering under the stock recovery plan of the Western Central Pacific Fisheries Commission (WCPFC) adopted in 2014. It is predicted that the interim rebuilding target, which is the historical median level of the spawning stock biomass, is likely to be met with a high probability by the deadline, i.e., 2024. Upon this, the WCPFC, whose competence covers the western part of the Pacific for this stock, and the Inter-American Tropical Tuna Commission (IATTC), whose competence covers the eastern part of the Pacific, have both decided to increase the catch limit by 15% (excluding the catch limit for juveniles) for the first time since regulations were introduced for the stock. If the recovery continues at the current pace, it is possible to achieve the next rebuilding target, which is to increase the spawning stock biomass to 20% of the initial level by 2034.

While stock recovery is welcome, fishermen, the Fisheries Agency of Japan and researchers are beginning to face various problems as the Pacific bluefin tuna stock is recovering so quickly.

### Problems for Pacific bluefin tuna research activities

One problem is that as the stock recovers, the catch rate improves, which causes the total allowable catch (TAC) to be used up more quickly. After the TAC is fulfilled, fishermen must release all subsequent bluefin tuna they have caught. The Fisheries Agency of Japan, which is responsible for overall fisheries management in Japan, is facing complex problems such as: (i) the need to change allocations among different fisheries and prefectures and (ii) the need to strengthen data collection from fishermen and fishermen's groups who have caught bluefin tuna, including recreational fishermen. In addition, since the Pacific bluefin tuna stock is managed by international agreements, there must be good cooperation and coordination with other Members of the WCPFC and IATTC on national allocations when the total catch limit is increased.

Researchers are also facing serious problems. The contraction of the fishing ground and period due to the increasing catch rates has led to an increase in the spatio-temporal areas where no data are obtained. For example, there was a concern that the total catch of juvenile bluefin tuna in the coastal fisheries was likely to exceed the catch limit during the 2017-2018 fishing period and all the coastal fisheries had to stop fishing to avoid overshooting the limit. This reduced the amount of data available to be used for stock assessment, particularly those from coastal troll and long line fisheries, down to 20 to 30% of the years before regulations were established. It is difficult to obtain the same level of data under such circumstances. If an individual allocation for each vessel or fisherman is introduced to prevent the total catch from reaching the catch limit earlier, the fishing pattern will no longer be the same as in past years. This would change the stock indices and the reliability of the data and force scientists to abstain from the use of the data in a worst-case scenario. Generally speaking, it is not easy to use the same stock indices for a long time because the fishing gear and its fishing efficiency changes over time. To overcome this problem, scientists divide stock indices into several different periods, each of which reflects the specific condition of the period. However, it takes scientists several years to know whether the stock is increasing or decreasing even if they successfully establish a new series of stock indices. This means that they cannot get reliable information on the stock status for these years.

The stock assessment of Pacific bluefin tuna uses a so-called integrated stock assessment model. This assessment model incorporates, as basic information, biological information such as catch amounts, distribution of body length of the catch and growth rates, as well as fishery information such as stock indices obtained from fishing activities. The model

then estimates the variation of the stock over time so as to minimize inconsistency among those pieces of information. The more reliable the basic information is, the more reliable the estimate becomes. If, on the other hand, the information is unreliable, the estimate will be unreliable. Among the various kinds of basic information, the biggest concern would be quantitative and qualitative changes in stock indices. The stock indices are the key element in deciding the stock trend in the assessment model. In the case of Pacific bluefin tuna, stock indices obtained from Japanese fisheries have been used for estimating recruitment levels and the spawning stock biomass. Due to the reasons explained above, scientists cannot make the estimates with confidence. In addition, there seems to be a certain amount of released catch, which is not negligible, but there is no record and it is not clear how many fish survive after being released. Not so much is known about catches made by recreational fisheries. These circumstances lower the reliability of other important data such as amount of catch and length distribution. Because, unlike southern bluefin tuna, this stock has no fishery-independent indices, this problem becomes more serious. Thus, there is a dilemma in that, while the stock recovers, the stock indices used for the stock assessment deteriorate, making the assessment less reliable.

### Possible solutions for this dilemma

What should we do to overcome this dilemma and maintain the reliability of the stock assessment? The following are possible measures:
(1) There seems to be dead discards of bluefin tuna. Reporting of dead discards should be strictly implemented.
(2) The amount of live releases of bluefin tuna as well as how fish were released should be reported.
(3) The allocation for those fisheries whose data are used to calculate stock indices, i.e., long line and troll fisheries, should be increased so that they can operate fishing in the main fishing grounds during the main fishing seasons.
(4) Several fishing vessels should be selected as monitoring vessels and given enough allocation so that they can conduct research fishing aimed at collecting data for calculating stock indices free from the effects of fishery management.
Regarding (4) above, it seems that a new initiative has been started, using troll vessels as monitoring vessels to obtain new stock indices. These monitoring vessels use an allocation for research purposes that Japan sets aside. The long line fishery whose catch data have been used for calculating indices for the spawning stock biomass is facing a rapid contraction of its fishing season. It is strongly hoped that a separate research allocation is set for this fishery, like in the case of the troll fishery, so that monitoring vessels can collect data for calculating stock indices. The releases of fish should be recorded in all the fisheries, including recreational fisheries. Dispatching observers at fishing grounds, inspection of landing and monitoring of fishing vessels will increase the reliability of the data from fishermen. These activities cannot be implemented by the efforts of the Fisheries Agency of Japan alone. There must be more mutual understanding among all stakeholders involved in bluefin tuna fisheries such as fishermen, buyers, and researchers with the aim of reestablishing how these fisheries and fishery management should be in future. It is suggested that an action plan with a clear timeline be established to resolve each problem.

### Conclusion

Different from the Atlantic bluefin tuna fisheries and the southern bluefin tuna fisheries, the Pacific bluefin tuna fisheries catch not only bluefin tuna but also many other species. Pacific bluefin tuna could be often considered bycatch in terms of the catch volume relative to those of other species. It is understandable that management of the Pacific bluefin tuna fisheries is very difficult as there are many types of fisheries, each of which has a distinct fishing operation style. It is commendable that despite these difficulties, continuous efforts over many years have resulted in the recovery trend of the stock. It should be noted, however, that there are still many problems and those involved in the fisheries should not rejoice too exuberantly over the recovery. The situation may be similar to other fisheries in Japan. The measures taken to manage the Pacific bluefin tuna fisheries are also required for other fisheries if Japan wants to manage fishery resources in a sustainable manner based on scientific evidence. The management of the Pacific bluefin tuna fisheries would be a test case for Japan's fishery management.

## 2. Where do bluefin tuna caught in the Indian Ocean come from?

There have been a limited number of cases in which bluefin tuna stray into the Indian Ocean, but scientists say that they are not commonly distributed there. However, a recently published article explains that a series of catch reports of bluefin tuna in the Indian Ocean have been made (Antonio Di Natale et al., "UNUSUAL PRESENCE OF BLUEFIN TUNA IN THE GULF OF ADEN AND IN THE INDIAN OCEAN," 8th Working Party on Temperate Tunas (WPTMT), 13-15 April 2022, IOTC-2022-WPTmT08DP). It is not clear whether such repeated reports of catches of bluefin tuna are the result of advances in research technology or whether they have merely not been reported until now even though there were catches in the past. The author is very much interested to know whether such

catch reports will continue. If such reports continue, there is a possibility that the ecology of tuna and/or the surrounding ecosystem is/are changing. According to this article, catch reports were made by Sri Lanka, Yemen, and Oman. In all three cases, only one fish was caught in one long line fishing operation. In the case of Oman, since DNA testing was conducted to identify the species and this case was published as a scientific paper, the scientific validity is likely to be high (International Journal of Environment, Agriculture and Biotechnology (IJEAB) Vol-2, Issue-4, July-Aug- 2017). There is one report of one bluefin tuna being caught by a Japanese long line fishing vessel operating in the temperate zone off the west coast of Australia in the Indian Ocean. Further investigation of available statistics revealed that bluefin tuna was caught in the area around 10 degrees north off the west coast of the Indian Peninsula, which is somewhat far from Sri Lanka. It is not clear whether the catch was of a single fish or multiple fish, but probably a single fish as the catch was made in the tropical zone. In this connection, it is known that Japanese long line fishing vessels have been catching bluefin tuna in the Pacific tropical zone since olden times, although the catch is sporadic. Bluefin tuna caught in any tropical zone is always a big fish of about 2 meters. The article written by Di Natale et al. speculated about whether the bluefin tuna came from the Pacific Ocean or the Atlantic Ocean, as well as whether the fish was southern bluefin tuna. Ultimately, the article concluded that the fish was most likely Pacific bluefin tuna. While agreeing to this conclusion, the author would like to provide his views on some of the interesting points contained in the article.

(1) Possibility that the fish was Atlantic bluefin tuna
It is already known that Pacific bluefin tuna has been caught in the western part of the Indian Ocean, but not all bluefin tuna caught in the Indian Ocean have been proven to be Pacific bluefin tuna. This is because, in some cases, only photos and videos are available, and no DNA testing has been conducted to directly identify the species. The article mentions the possibility that Atlantic bluefin tuna could stray into the tropical zone of the western Indian Ocean through the Suez Canal and the Red Sea. Incidentally, species that move in this way are called “Lessepsian species,” in tribute to Ferdinand de Lesseps, who greatly contributed to the excavation of the Suez Canal. The article explains that this movement is possible since: (i) large Atlantic bluefin tuna migrate around the entrance of the Suez Canal on the Mediterranean side; (ii) the distance between the Mediterranean and the Indian Ocean is not so large; (iii) the habitat conditions of the Mediterranean and the Indian Ocean are not so different; (iv) bluefin tuna are known to suddenly change habitat; and (v) bluefin tuna are capable of adapting to new environments.

(2) Possibility that the fish was southern bluefin tuna?
Southern bluefin tuna are sometimes mistaken for bluefin tuna since their features look alike. This may lead to the possibility that some of the fish recognized as bluefin tuna caught in the tropical zone of the western Indian Ocean are actually southern bluefin tuna. The article investigated available photos and other information and concluded that they were not southern bluefin tuna, as the caudal keel, which is found horizontally before the caudal fin, was black, whereas that of southern bluefin tuna is yellow. The author also believes that they were not southern bluefin tuna because southern bluefin tuna larger than 2 meters are extremely rare.

(3) Possibility that the fish was so-called “small southern bluefin tuna”
The article introduces anecdotal information from a skilled tuna dealer that a certain volume of small tuna whose weight is between 10 and 15 kg and which are called “small southern bluefin tuna” have been caught by long line fisheries in the tropical zone of the western Indian Ocean. The information is somewhat doubtful, however, as southern bluefin tuna of this size are not distributed in the tropical zone. The author believes that this so-called small southern bluefin tuna is longtail tuna since the catch area consists of coastal zones and overlaps with the distribution of longtail tuna.

It is not clear whether the single bluefin tuna caught was separated from a school or was swimming together with others in the same school and caught alone. Because bluefin tuna usually swim in a school, some scientists say that by releasing a bluefin tuna with a traceable tag and tracing the fish going into a school, fishermen can find a school of bluefin tuna much easier and catch them in a more efficient way. As remarkable innovations are being made in research technology on the migration and ecology of tuna, it may be possible to verify whether the sporadic single catch of bluefin tuna was a lone individual or came from a school. If the latter is the case, there could be more dense distributions of bluefin tuna in the tropical zones of the Pacific and Indian Oceans even though the catch has been a single individual in many cases. Also, the idea of utilizing a bluefin tuna with a traceable tag for more efficient fishing may become more realistic.

Do the bluefin tuna found in the tropical zone move to a spawning ground in the temperate zone during the spawning season? Why do these bluefin tuna move to the tropical zone when most bluefin tuna move to the temperate zone or polar zone after spawning? The findings in the article raise one question after another.