JOINT IATTC AND WCPFC-NC WORKING GROUP MEETING ON THE MANAGEMENT OF PACIFIC BLUEFIN TUNA
EIGHTH SESSION (JWG-08)

Fukuoka, Japan
3 – 5 July 2023

Need for Timely Adjustment of Catch Limits of Pacific Bluefin Tuna

IATTC-NC-JWG08-2023/DP-14

Japan

1. SUMMARY

Through the implementation of the conservation and management measures developed by WCPFC and IATTC, in particular those of significant reduction of the fishing mortality of juvenile fish, the spawning stock biomass (SSB) of Pacific bluefin tuna (PBF) is rapidly increasing during the past 10 years, and its speed has been accelerating. According to the latest stock assessment by the ISC in 2022, the initial rebuilding target of Harvest Strategy for PBF (HS2021-01) was achieved already in 2019, five years earlier than originally targeted, and the second rebuilding target of HS2021-01 (20%$SSB_{F=0}$) is projected to be achieved with a probability of 60% in 2023, six years earlier than targeted[1].

Under this rapid increase in PBF biomass, Japanese fishermen have been observing more frequent and bigger migrations of PBF in almost all fisheries, including passive ones such as set net fishery, in various parts of Japan. WCPFC and IATTC increased the catch limits of large PBF (30kg or larger) by 15% since 2022, but this increase has apparently fallen behind the rapid increase of the PBF stock.

Japanese fishermen have been facing increasing cases where they are forced to release PBF to comply with the catch limits. Such hard challenges are not only in set net fishery, but also in other fisheries. When they release PBF, they have to release other target fish species from their nets, which causes serious operational burdens and huge economic losses.

There is an urgent need to adjust the catch limits for PBF in a scale that corresponds to the significantly increased stock level under the conservation requirements.

2. HISTORICAL TREND OF SSB AND CATCH

(1) Decrease in fishing mortality of small PBF and recovery of SSB

PBF spawning stock biomass (SSB) decreased constantly during the period 1995 -2010, and it recorded a historical low level in 2010 (9,761 t (metric tons)). In response, WCPFC and IATTC worked collaboratively and adopted the harvest strategies (recovery plan) and the conservation and management measures including the catch limits. WCPFC introduced the catch limit (2002-2004 level) for small

[1] ISC, Stock Assessment of Pacific Bluefin Tuna in the Pacific Ocean in 2022 (ISC/22/ANNEX/13)

PBF (smaller than 30kg) in 2010 and then cut it by as much as 50% in 2014. The effect of this drastic measure resulted in a significant decrease in fishing mortality of ages 0-2 (see Figure 1). WCPFC also adopted the catch limit (2002-2004 level) of large PBF (30kg or larger) in 2016.

As a result of these conservation efforts, the stock has been recovering rapidly, and achieved the initial target level (approx. 40,000 t) in 2019, 5 years earlier than originally scheduled (See Figure 2).

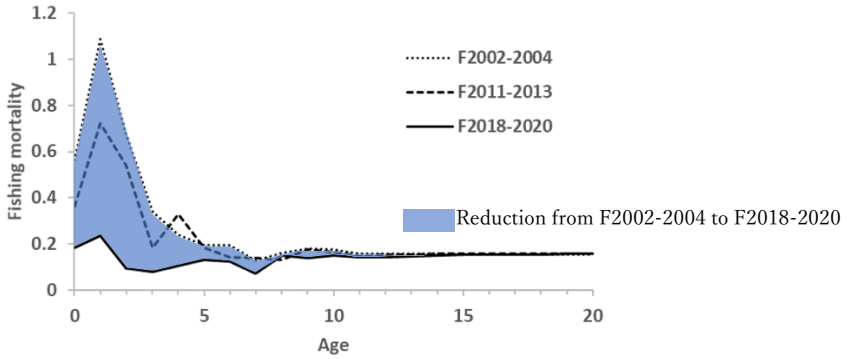

Figure 1: Age-specific fishing mortalities of PBF (source: ISC stock assessment report in 2022)

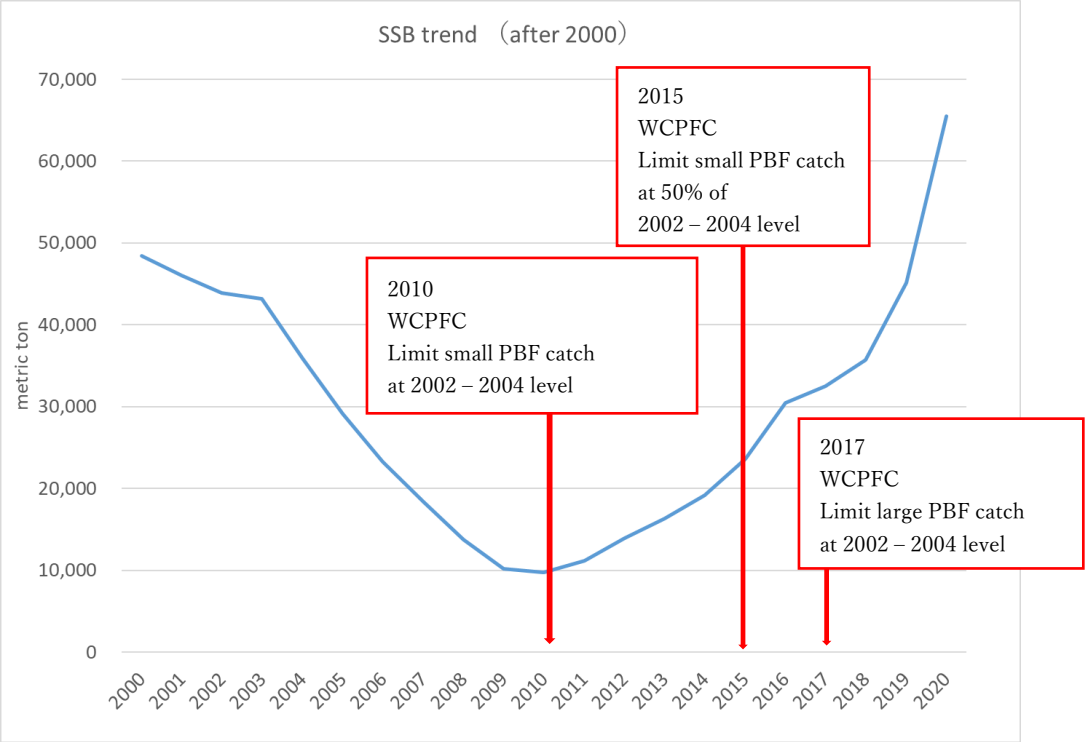

Figure 2: Historical trend of SSB (source: ISC stock assessment report in 2022)

(2) Trend in catch of small and large PBF by Member or Fleet

Table 1 summarizes historical catches of small and large PBF by Member or Fleet.

Year	Japan		Korea		Chinese Taipei	EPO commercial		EPO sport	
	small	large	small	large	large	small	large	small	large
2000	15,445	9,132	2,401		2,782	3,639	233	149	170
2001	10,251	3,960	1,186		1,843	868	335	130	214
2002	9,310	4,878	932		1,527	650	1,122	255	358
2003	7,952	2,455	2,601		1,884	1,203	2,091	185	170
2004	6,785	7,314	773		1,717	2,748	6,157	17	33
2005	14,796	6,872	1,318		1,370	2,754	1,996	42	31
2006	9,828	4,350	1,012		1,150	9,808	0	57	37
2007	8,519	5,309	1,281		1,411	1,849	2,342	6	6
2008	11,885	5,304	1,743	123	981	2,559	1,864	43	20
2009	9,704	4,324	901	34	888	1,278	2,157	123	33
2010	5,941	2,459	1,128	68	409	7,747	0	57	31
2011	9,105	3,899	670	1	316	1,518	1,332	134	91
2012	4,101	1,999	1,406	16	213	6,711	0	281	119
2013	3,299	3,120	581	24	335	1,085	2,080	588	221
2014	6,089	3,488	1,199		483	305	4,965	245	176
2015	2,490	3,870	676	1	618	39	3,141	276	124
2016	3,944	4,368	559	469	480	16	3,049	66	305
2017	4,131	4,868	670	73	415	86	4,045	192	271
2018	1,859	4,347	511	25	381	383	2,165	57	471
2019	3,047	4,467	564	17	493	662	1,862	302	177
2020	2,745	5,265	191	414	1,151	214	3,285	363	353
2021	3,164	5,365	452	58	1,479	199	3,045	589	572
average (2002-2004)	8,016	4,882	1,435		1,709	1,533	3,124	152	187
50 percent of 2002-2004 (▲50%)	4,008		718						

Table 1: Historical catches of small and large PBF by Member or Fleet (unit : metric tons)

(Summary of the data sources and calculation)

1) Japanese catch:
   - 2000-2012: Estimated by Fisheries Research Agency based on best available catch record
   - 2013-2021: Reported catch to WCPFC
2) Korean and Chinese catch:
   - 2000-2012: Reported catch to ISC
   - 2013-2021: Reported catch to WCPFC
3) EPO commercial and EPO sport fishery catch:
   Since US and Mexico catch reports do not have breakdowns of small (smaller than 30kg) and large (30kg or larger) fish, their catches were estimated by the following calculations.
   (a) Relevant data in the ISC 2022 stock assessment, weight at age (input to stock assessment) and estimated catch in number at age by fishery by quarter (output from stock assessment), were used. Fleet 13 and 14 were categorized as EPO commercial fishery, and Fleet 15 and 24 were categorized as EPO sport fishery. Age 0 to 2 (the 3rd quarter) were categorized as small PBF (smaller than 30kg), while age 2 (the 4th quarter) or larger were categorized as large PBF (30kg or larger).
   (b) Catches (metric tons) by size (small and large PBF) for each Fleet were calculated by

multiplying the number of fish caught by age (quarter year) and the weight at age (quarter year).

(c) EPO commercial and EPO sport fishery catches were estimated by multiplying the "small : large ratio" calculated in (b) above and US/Mexico catches in the ISC statistics. For 2021, the "small : large fish ratio" was assumed to be the same as 2020, since the data used in (b) above is not available.

Figure 3 shows the trend in catch of small PBF (smaller than 30kg) by Member or Fleet (same data as Table1) from the 2002-2004 levels (2002-2004 average catch was scaled to zero). In WCPO, the Japanese catch of small fish was reduced significantly through the conservation and management measures of 2010 and 2015.

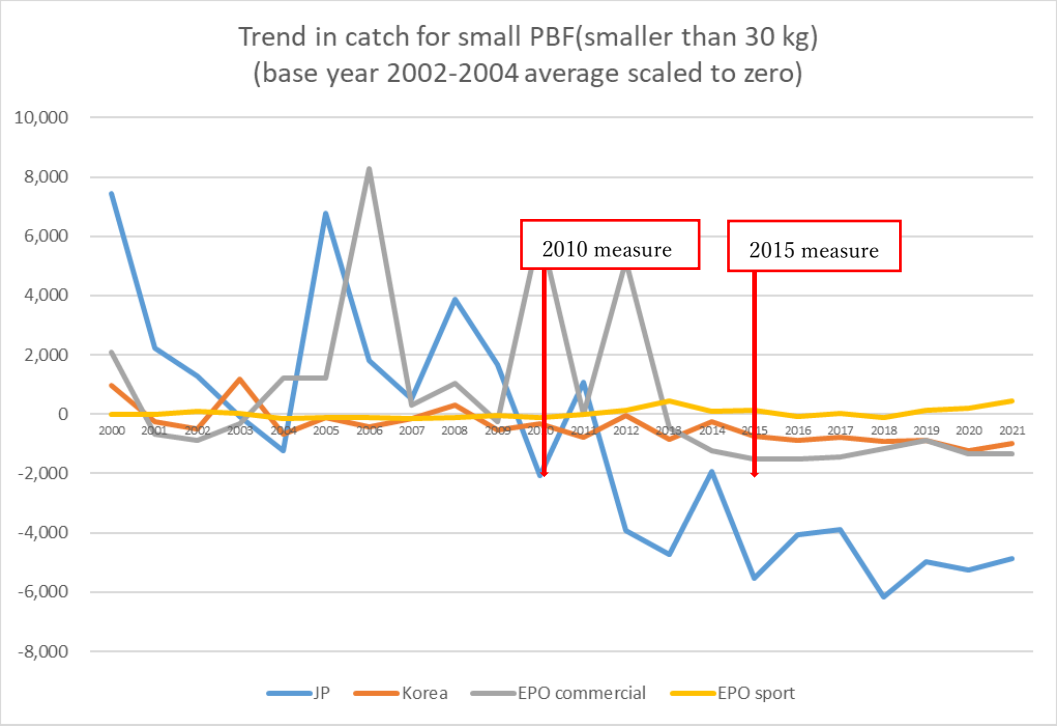

Figure 3: Trend in catch of small PBF by Member or Fleet (unit: metric tons)

Figure 4 shows the catch trend in small and large PBF in WCPO and EPO combined, from the 2002-2004 levels (i.e. 2002-2004 average catch was scaled to zero). Figure 5 shows the similar trend between WCPO and EPO, but catch for small PBF is approximated to the catch for large PBF by using the conversion factor of 0.68.

These figures indicate that WCPO made much greater reductions in catch of small PBF since the 2002-2004 levels, reducing the impact of its fisheries on the stock.

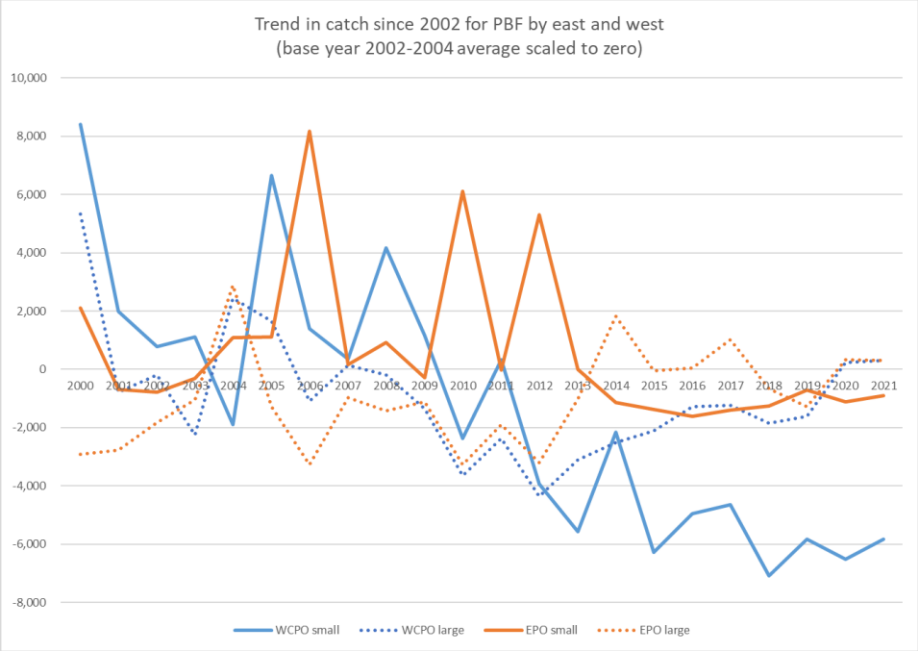

Figure 4: Catch trend in small and large PBF in a same graph, comparing the trend in WCPO and EPO (unit: metric tons)

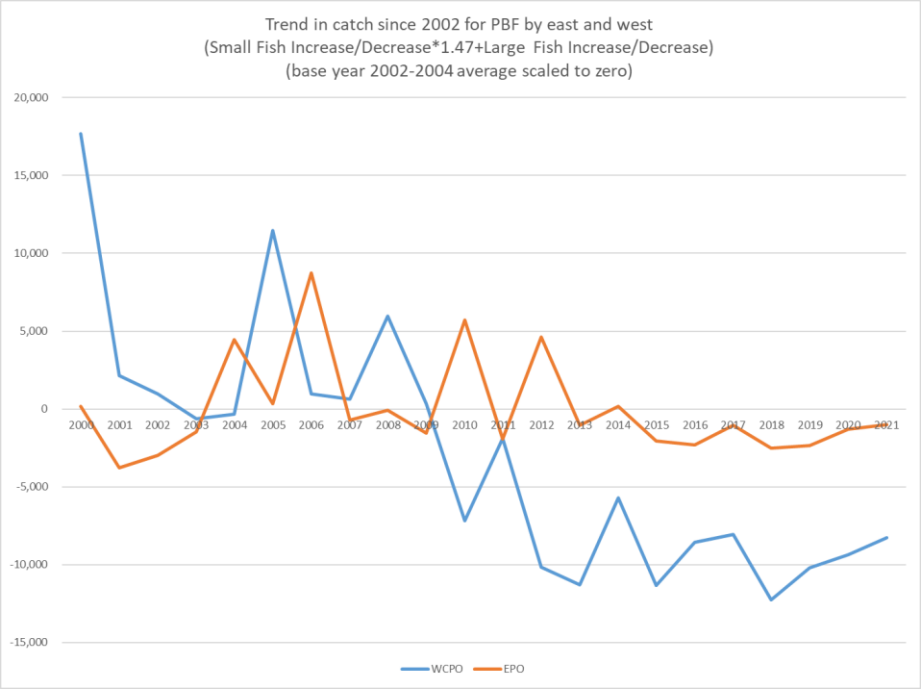

Figure 5: Catch trend in WCPO and EPO, with catch of small PBF approximated to large PBF (unit: metric tons)

Figure 6 shows the catch trends in small and large PBF by Member or Fleet (scale unit are different among graphs). In WCPO, catch for small PBF has been remarkably reduced, and catch for large PBF has been constrained too. In recent years, in EPO commercial fishery, the majority of catch has been shifted from small PBF to large PBF catch in recent years, which could be the result of the stock recovery and increased migration of large PBF. EPO sport fishing has increased its catch, both small and large PBF.

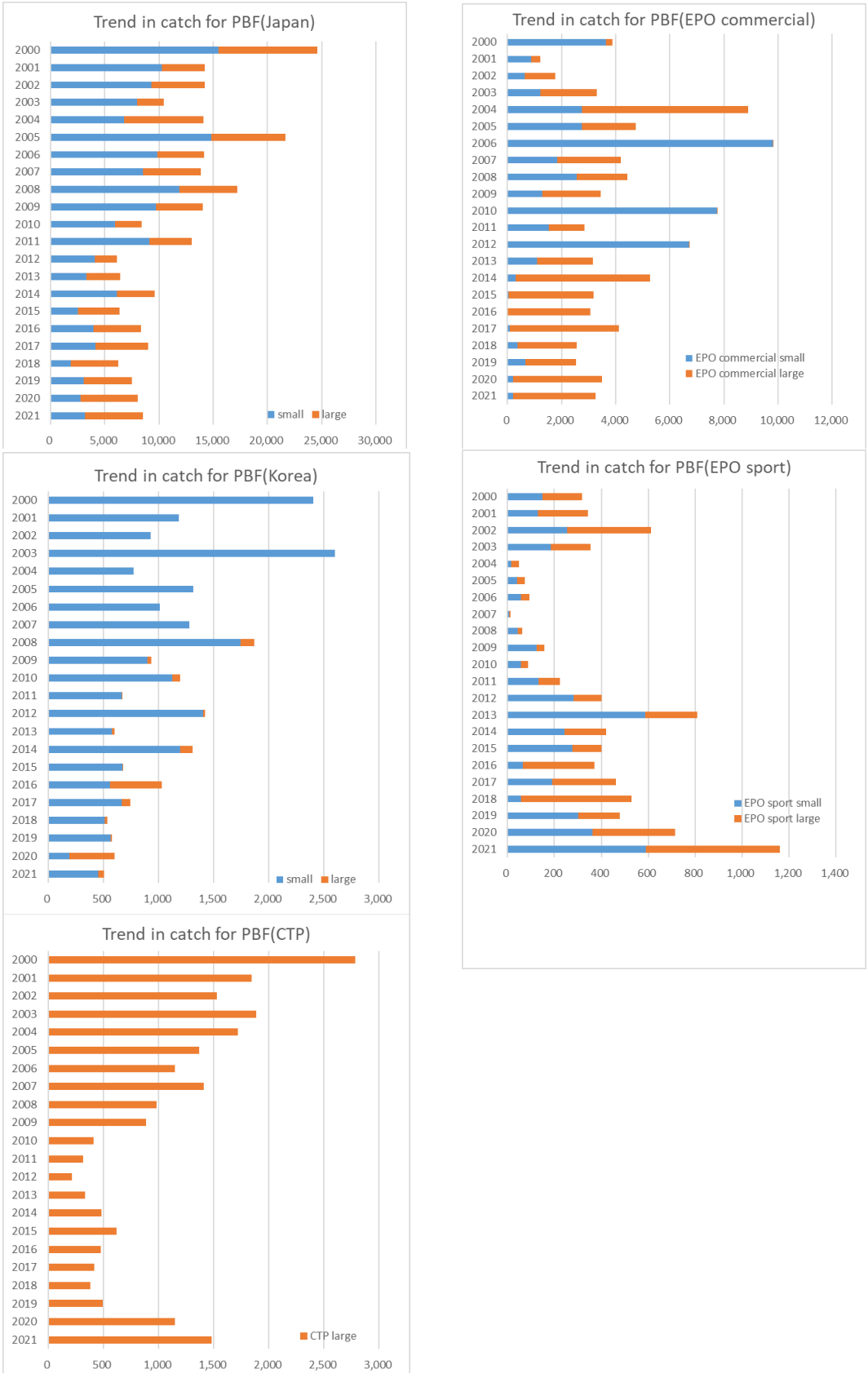

Figure 6: Trend in catch of small and large PBF by Member or Fleet (unit: metric tons)

3. NEED FOR TIMELY CATCH LIMIT ADJUSTMENT OF PBF

(1) As observed above, the PBF stock has been recovering rapidly, at a much faster pace than HCR requires. While Japanese and probably other fishermen have been making tremendous efforts and sacrifice, they have yet to receive allowable return from this fast stock recovery. As a result, they are suffering in heavy operational burdens as well as economic losses caused by growing PBF migrations under the fixed catch limits.

(2) Such burdens and losses are particularly serious in set net fishery, in which fishermen are frequently releasing PBF, inevitablly together with other fish in the net. Although they have developed selective catch/release techniques of PBF, such as the introduction of specially designed nets, and installation of fish finder inside the set net (so that the fishermen can wait until PBF swim out from the net) (Figure 7 and 8), the application of such techniques in actual fishing operations is still limited. In usual cases, fishermen just have to release PBF by sagging or opening a part of set net, which results in esscape of other fish species from the net, causing great economic losses. Such release is becoming more and more frequent all over Japan due to the significant gap between the growing stock level and the fixed catch limits. In some set net sites in Japan, fishemen released PBF from their net in more than half of their annual operations. This is not an exceptional case.

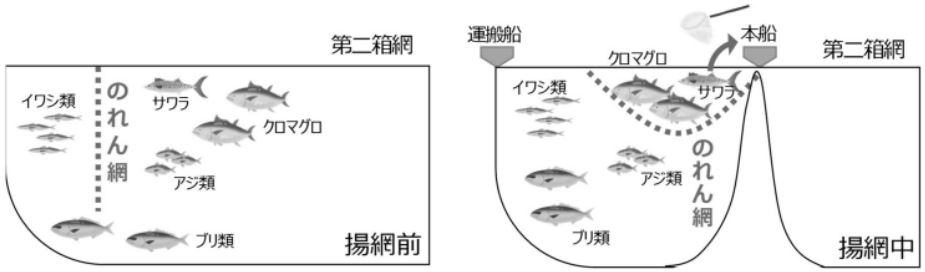

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Figure 7: Selective catch technique by the introduction of specifically designed nets
（Source: Report from national project for controlling catch of Pacific bluefin tuna, 2019）

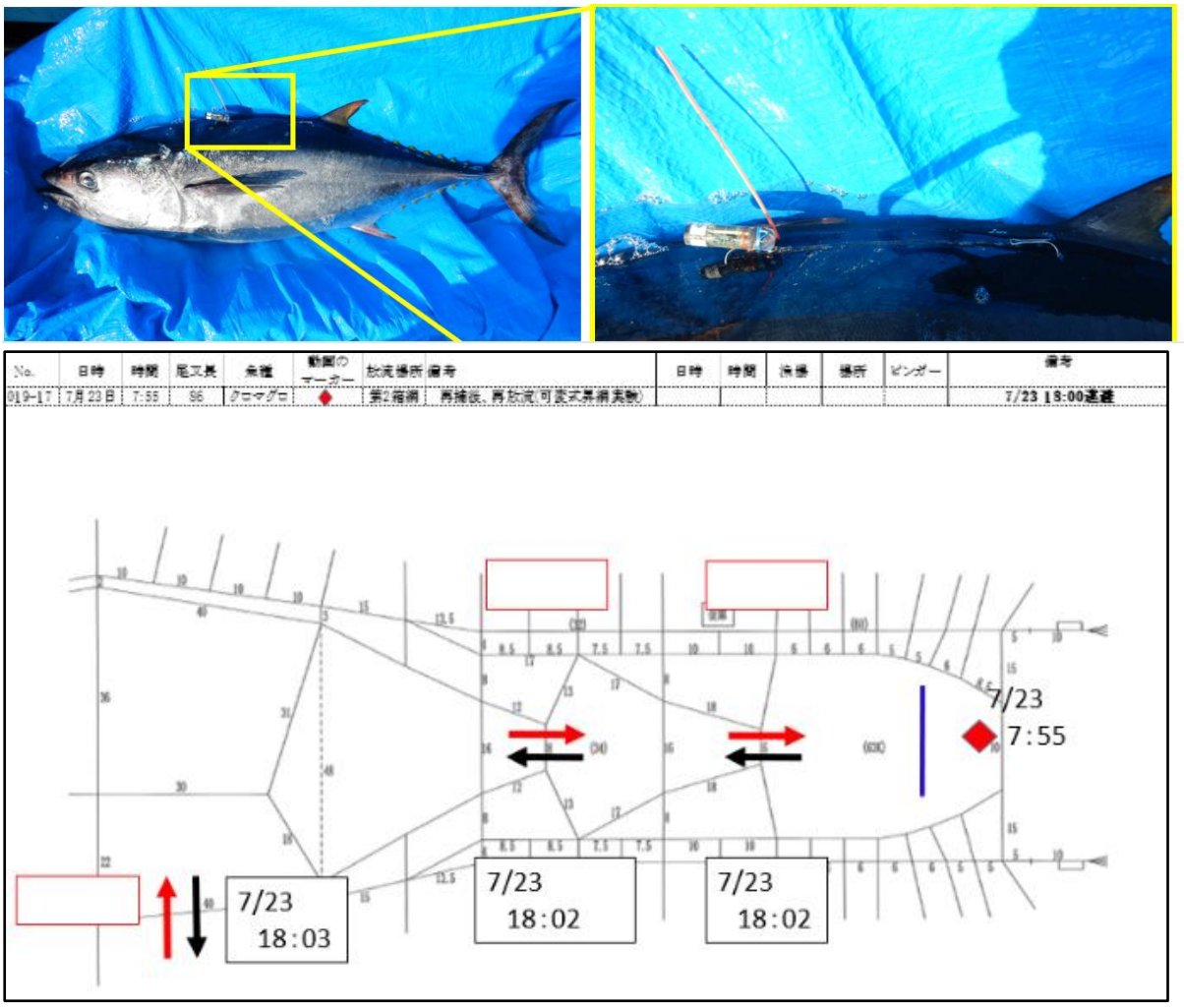

Figure 8: Analysis of the migration behavior of Pacific bluefin tuna in set nets using data pinger （Source: Mr. Hideki Noro, Horiei Co.,ltd and University of Marine Science and Technology）

Figure 9: Pacific bluefin tuna released by opening a part of set net

(3) Other fisheries are also suffering from similar operational burdens and economic losses. In squid jigging fishery, many PBFs flock around squid schools and scatter them. PBFs sometimes bite squids hooked on jigs and damage the fishing gears. Squid schools dive into deep bottom water and stay there, which makes jigging fishery unable to operate.

In longline fishery, fishermen are reducing the number of hooks to comply with their catch limits of PBF. For example, some coastal longline fishermen reduced the number of hooks from 250 to 20 in their fishing operations this year, but still caught 4 or 5 bluefin per day which exhausted their catch limits in a few days. After using up their catch limits, they had to move their fishing ground for other target species, away from areas where PBF migrates, or stop their operation. In artisanal troll fishery, after the exhaustion of their catch limit, they are forced to move far offshore targeting other species or stop their operation. These are just a couple of examples. The better migration fishermen observe, the more burdens and economic losses they face.

(4) Governments (central government and local governments) also have been paying tremendous administrative efforts and costs in implementing the management of PBF catch in Japan. Such efforts include monitoring and enforcement activities to ensure the compliance with catch limits and the coordination for proper catch limit allocations among prefectures and/or management units (such as fishery cooperatives). The administrative efforts in managing the catch limits is growing as the conservation gaps between the stock level and the fixed catch limits are widening.

(5) There is a prevalent interpretation among WCPFC stakeholders that the term "areas under national jurisdiction" in the Convention text means "EEZs", and hence, the conservation and management measures adopted by the WCPFC would apply only to EEZs and the high seas unless specifically agreed by the States concerned[2]. Regardless of the interpretation among WCPFC stakeholders and the fact that a significant portion of Japan's PBF catch is made within its territorial and internal waters, Japan has been implementing the PBF conservation and management measures throughout all waters where PBF migrate. In this regard, too, reasonable and timely adjustment to the conservation and management measures is essential and crucial so as to maintain the conservation efforts.

[2] Tsamenyi, Martin and Hanich, Quentin: Fisheries jurisdiction under the Law of the Sea Convention: rights and obligations in maritime zones under the sovereignty of Coastal States 2012, 783-793. https://ro.uow.edu.au/lawpapers/625