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**By-catch of Pacific Bluefin Tuna in the Waters off Korea**

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## Introduction

Pacific bluefin tuna (PBF) are fished by various fishing gears - purse seine, set net, trawl and dragged gears - as by-catch species in the coastal waters of Korea. Because PBF are incidentally caught mainly by Korean domestic purse seine fishery targeting mackerels and its catch are changed by monthly, PBF was not paid much attention by Korean domestic fisheries until recently. Accordingly, the catch and size data of PBF have not well been documented. The PBF caught in Korean waters mainly consists of small size less than one meter of fork length, most of which are exported to Japanese market for sashimi and some minor quantity are consumed domestically.

Korean government initiated fisheries observer programs for both domestic and international water fisheries including tuna fisheries. At its initial stage, the observer program is small but will be gradually expanded to cover all necessary areas of fisheries. The National Fisheries Research and Development Institute (NFRDI) has taken efforts to collect the PBF data by the Korean fisheries and is reconstructing database system.

## Status of Korean Fisheries for PBF

### *Catch*

Offshore purse seiner in Korean waters catches most of PBF as a by-catch. From the year 2000 to 2004, average catch of the PBF from 33 purse seiners and 4 trawlers amounted to 941 mt but the catch varies between 636 and 1,591mt (Table. 1). The decreased 2004 catch by 60% compared with 2003 catch was mainly due to the decrease in purse seine catch.

Table 1. Korean northern blue fin tuna catch by fisheries.

Year	Vessel active			Catch (mt)		
	Purse seine	Trawl	Total	Purse seine	Trawl	Total
2000	33	0	33	794	0	794
2001	33	4	37	995	10	1,005
2002	33	4	37	674	1	675
2003	33	4	37	1,591	0	1,591
2004	33	4	37	636	0	636

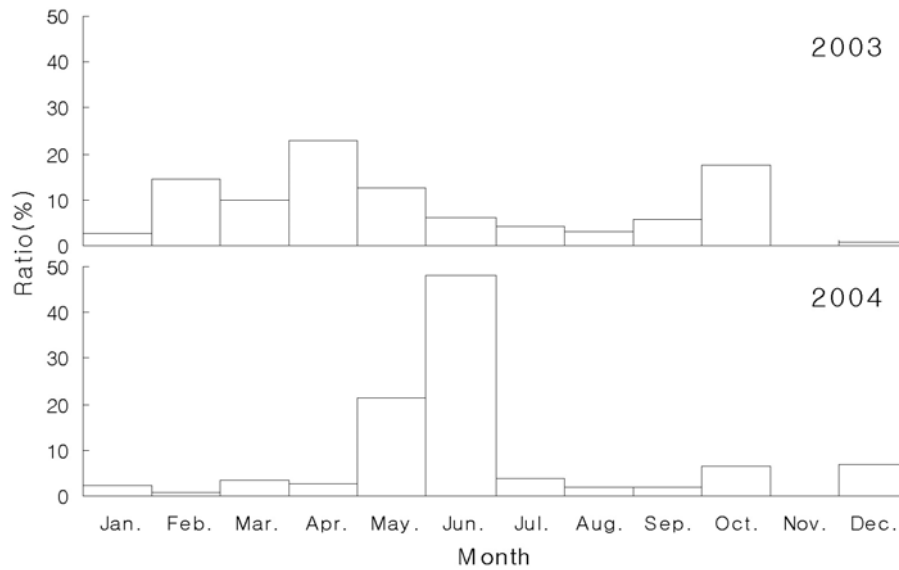


Fig. 1. Monthly catch proportion of Pacific bluefin tuna by the Korean offshore purse seine fishery in 2003 and 2004

Monthly catch proportion shows that the highest catch was taken in April and October in the year 2003 but in May and June in the year 2004 (Fig. 1), and only minor catches were reported during winter months from November to January in both years. These trend was shown in year 2002.

Total longline tuna production in the Pacific during the last 10 years has been fluctuating between 37,000 to 60,000 mt, averaging 48,000 mt. Catches in the North Pacific Ocean ranged from 11,000 to 27,000 mt, averaging 18,000 mt during that period. Table 2 shows longline tuna catches by species in the North Pacific Ocean.

Table 2. Estimated catches of Korean longliner in the North Pacific area by species

Species Year	Albacore	Yellowfin tuna	Bigeeye tuna	Bluefin tuna	Blue Marlin	Stripe Marlin	Sword fish	White Marlin	Sailfish	Skipjack	Others	Total
1995	14	6,528	9,048	0	1	249	8	0	221	0	3,164	19,231
1996	158	4,913	3,903	0	8	348	12	0	244	0	1,817	11,403
1997	404	5,031	6,661	0	114	828	246	2	1,292	0	4,830	19,410
1998	218	3,544	13,991	0	265	519	123	11	382	0	8,159	27,212
1999	99	3,946	7,598	6	131	352	104	5	198	0	3,555	15,994
2000	15	4,091	6,212	19	76	436	161	1	127	2	5,282	16,423
2001	64	5,275	9,141	2	132	206	349	25	28	2	6,434	21,657
2002	113	2,893	9,814	0	121	153	350	1	123	0	1,815	15,383
2003	144	4,219	8,861	0	125	172	311	13	129	6	1,098	15,079
*2004	68	4,654	12,605	0	175	75	350	3	1	109	885	18,925

\* 2004 data is preliminary

Major species in the North Pacific Ocean longline catches are bigeye and yellowfin, which comprised 74% of the total catch in these area. In 2004 bigeye catches increased by 42%, while albacore and billfishes catches decreased by 53% and 19%, respectively compared with those in the previous year.

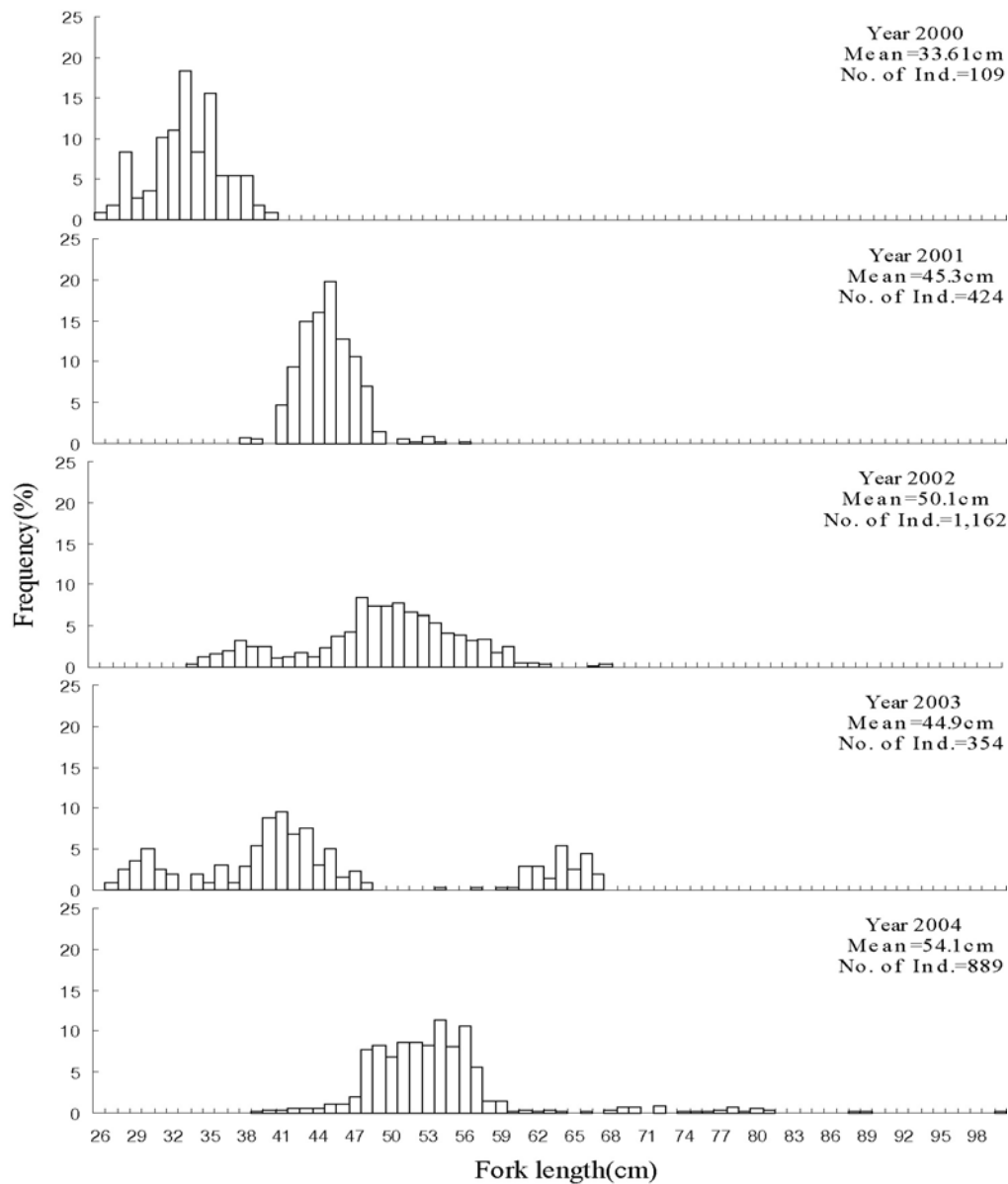


Fig. 2. Fork length frequency distribution of Pacific bluefin tuna by the Korean purse seine fishery during 2000 ~ 2004.

***Size composition***

To monitor the size of purse seiner-caught PBF, monthly sampling was undertaken at a local landing port for purse seine fishery. Fork length of measured fish ranged from 26 cm to 73 cm and mean size increased every year.

### *Fishing area*

Since PBF is a by-catch species of offshore purse seine fishery targeting mackerels, catch distribution of this species largely depends on the distribution of target species and the degree of association between PBF and mackerels. Fishing area for PBF were mainly scattered in the southern waters of Korea near the Cheju and Tsushima Islands and nevertheless of catch amount was rare, occasional catch was taken in the Yellow Sea (Fig. 3). However, catch distribution shows annual fluctuation depending on fishing and oceanographic condition for target species.

Monthly distribution of PBF catch demonstrates that major catch were taken during February-October in 2003 and most of the catches were recorded in the southern waters and some catch were also reported from coastal areas near Busan during October. In contrast, in the year 2004 during April-July catches were made in the South Sea and Cheju Island and during September-November in the Yellow Sea. These tendency also was shown in year 2002.

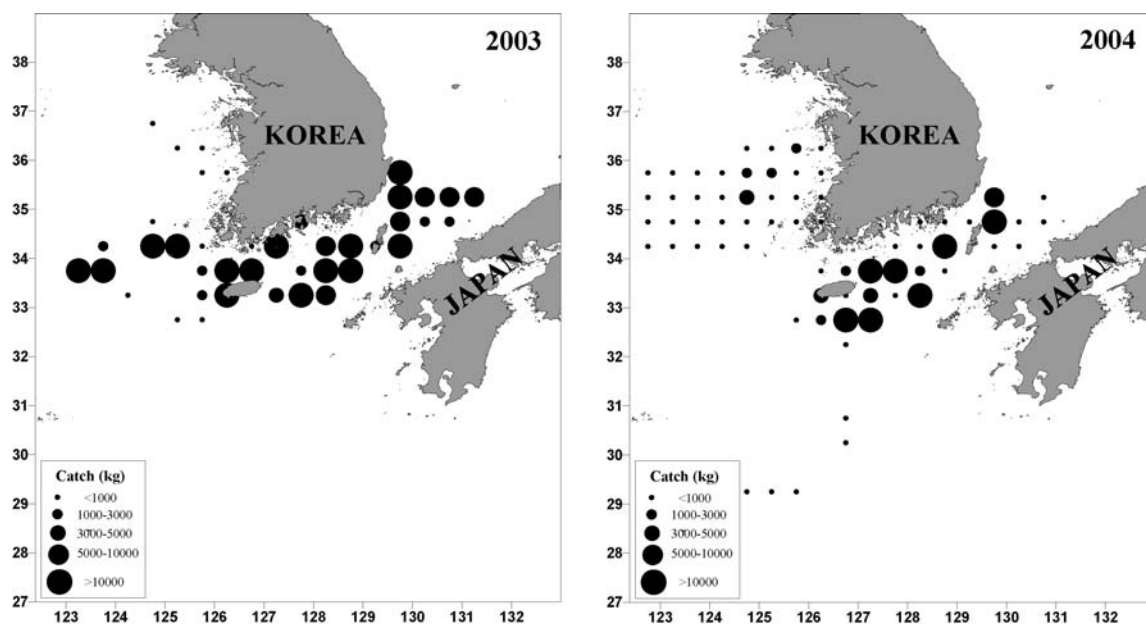


Fig. 3. Catch distribution of Pacific bluefin tuna by Korean purse seine fishery from 2003-2004.



Fig.4-1. Monthly catch distribution of Pacific bluefin tuna by Korean purse seine fishery in 2003.

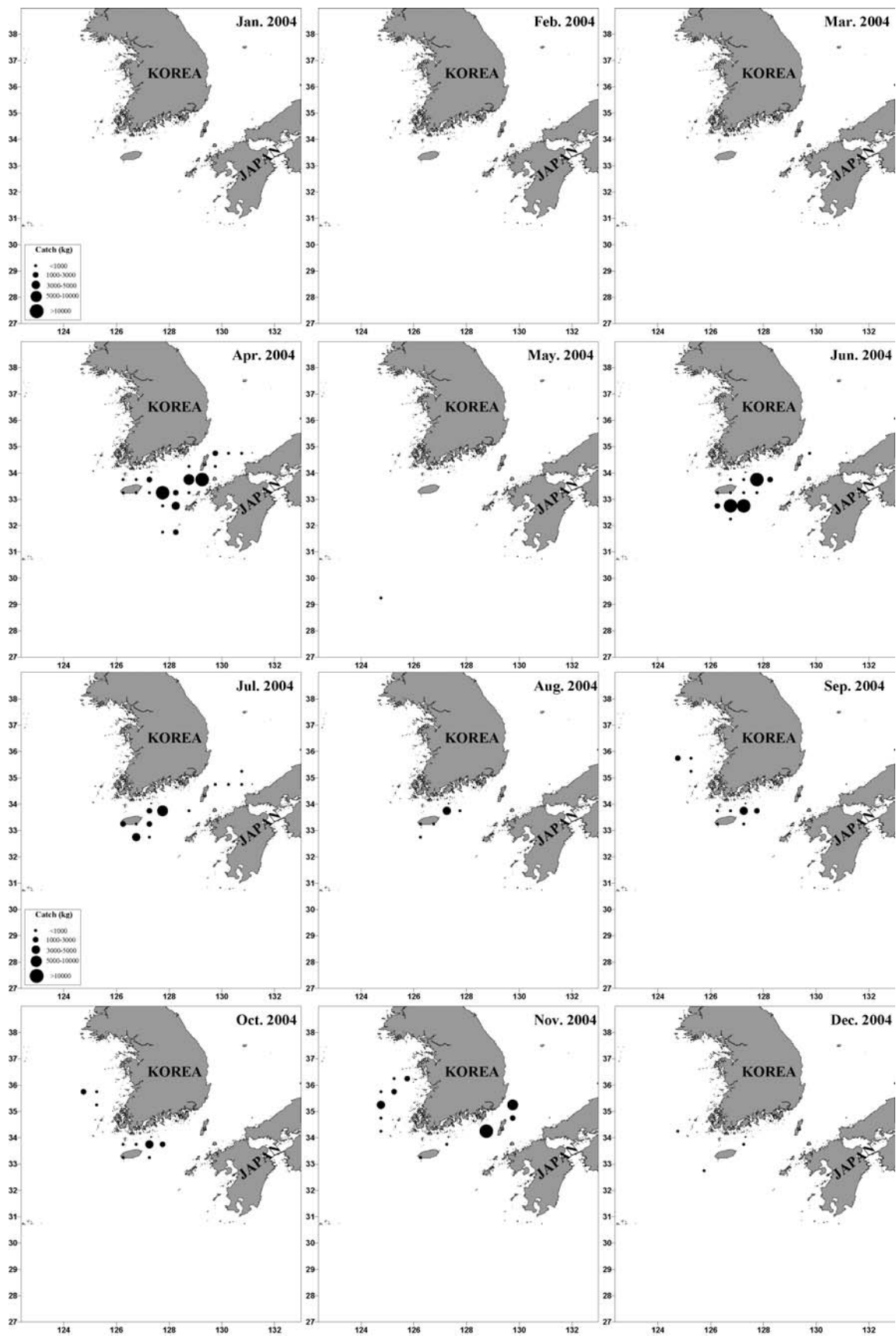


Fig. 4-2. Monthly catch distribution of Pacific bluefin tuna by Korean purse seine fishery in 2004.

## **Research Activities**

The Pacific Data collection and compilation have been carried out by NFRDI for the scientific purposes only since 1998. But the monitoring of fisheries, biological sampling has been regularly carried out at every domestic landing sites from 2004 year.

NFRDI is reconstructing database system for handy manipulation and analysis of fisheries data. Old data files will be revisited and reviewed for the correction or verification of the existing statistics. Therefore, we do not exclude a possibility of minor correction in our previous statistics. However, this can be interpreted as a strenuous effort for Korea to collaborate with all country of tuna fisheries for the better understanding of our fishery statistics.