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A Summary of the Korean Tuna Fishery Observer Program for the Pacific Ocean in 2006

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Korea began to develop its observer program for distant-water fisheries including tuna fisheries in 2002. The purpose of this program is to meet the requirements of relevant regional fisheries bodies such as the WCPFC and therefore the mission of trained observers are similar to those set out in the convention of the fisheries bodies. Before the official observer program was launched, Korea had irregularly dispatched NFRDI scientists aboard commercial tuna vessels to monitor fisheries and collect reliable catch statistics including biological samples, which were unobtainable by the regular data collection system. During the past 10 years, a total of 12 scientific observations were conducted for tuna fisheries operating in the Western and Central Pacific where the majority of Korean tuna purse seiners and longliners were active.

In 2006, 2 observers were deployed to monitor tuna fisheries in the Pacific Ocean. Results of the two observer trips conducted in the Pacific during 2006~early 2007 were summarized.

Purse seine fishery

The Western and Central Pacific Ocean (WCPO) serves as a usual fishing ground for the Korean tuna purse seine fishery since the early 1980s. To monitor this fishery, one trained observer was placed aboard Korean tuna purse seine vessel (807 GRT) targeting skipjack and yellowfin tuna during September 30-October 29, 2006.

The purse seiner was equipped with radars, color video and scanning fish founders, doppler sonar current meter, net depth recorder and so on and were operating auxiliary boats consisting of a skipper boat, net boat and one speed boat. To locate tuna schools, Korean tuna purse seiners usually carry helicopters. The purse seine net used by the monitored Korean purse seiners was about 1,800 m in length and it was deployed about 155-210 m in depth.

During the 24 days of the observation period, a total of 19 purse seine sets were monitored in the waters off the Kiribati, between 00°15'S-02°28'S and 173°52'-179°59'E (Fig. 1).

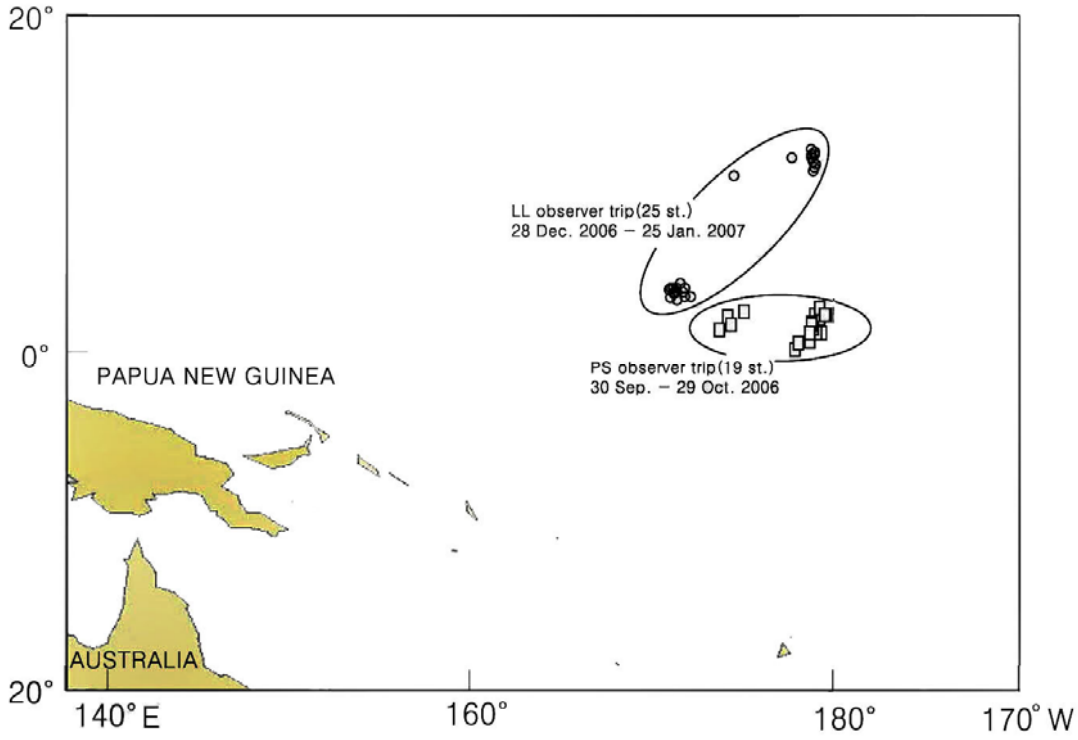

Fig. 1. Purse seine and longline observation points

The sets consisted of 10 free-swimming school sets and 9 log-associated school sets (Table 1). The success rate of operating sets with 15.0mt or more of tuna catch were 40% for free-swimming school sets and 100% for log-associated school sets. Total observed catches were 725mt for target species and 1.4mt for bycatch species. Catch composition for target species averaged 76% for skipjack and 24% for yellowfin. Catch per unit effort (CPUE, mt/set) of this fishery was 34.3 mt/set on average and CPUE of log-associated school sets was the same as that of free-swimming school sets.

Bycatch were observed in 9 log-associated school and 1 free-swimming school sets. However, it was not possible for us to list all bycatch species to the species level due to the lack of data from the observer. 2 sharks and some miscellaneous fish species (i.e. rainbow runner, file fish, dolphinfish etc.) were recorded.

Length frequency data of skipjack and yellowfin tuna was also collected by the observer. A total of 71 skipjack and 51 yellowfin tuna were measured onboard (Fig. 2). The fork length of target species ranged 37-78cm (mean 54.0cm) for skipjack tuna and

35-145cm (mean 78.9cm) for yellowfin tuna. As the continuation of a small voluntary tagging program by NFRDI, the observer in cooperation with fishermen placed tags on 7 yellowfin and 3 skipjack tunas and released them.

Table 1. Catch (mt) and CPUE (mt/set) by school types of the Korean tuna purse seine fishery during the scientific observation in 2006

school types	No. of set	Success rate (%)	skipjack tuna		yellowfin tuna		Subtotal (skj+yft)		Total	
			catch	CPUE	catch	CPUE	Catch	CPUE	catch	CPUE
Free-swimming school	10	4(40%)	300	30.0	85	8.5	385	38.5	386	38.6
Log-associated school	9	9(100%)	254	28.2	86	9.6	340	37.8	342	38.0
total	19	68%	554	29.2	171	9.0	725	38.2	728	38.3

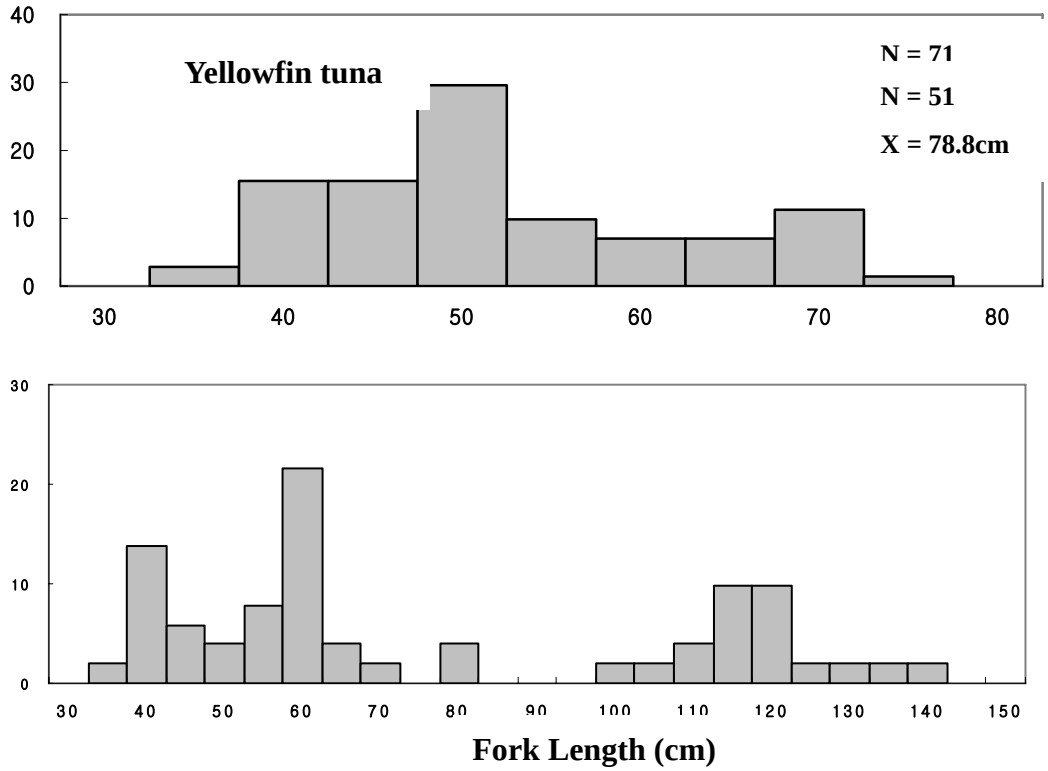

Fig. 2. Length frequency distributions of skipjack and yellowfin tunas.

Longline fishery

To monitor the Korean tuna longline fishery operated in the Pacific, one trained observer was deployed to Korean longliners (410 GRT) fishing in the Western Central Pacific Ocean (hereinafter WCPO area), between 03°00'-12°05'N and 170°43'-177°55' (Fig. 1).

WCPO area

During the 29 days of the observation period from 28 December 2006 to 25 January 2007, a total of 25 longline sets (one set per day) were monitored. The average number of baskets used for each set was 160 and hooks used ranged from 2,550 to 2,880 (average 16 hooks per basket). Mean length of main line was 135km and those of buoy line were 30-35m. Length of branch line was 43 m and 10m length of lead line was used. Lead material was nylon monofilament with diameter 1.8mm. The fishing vessel used no.3.6 tuna hooks.

Longline setting began at around 7:50am in the morning and finished by noon and after about 3 hours of soaking, the longline was hauled until the following morning by 6:30 am. Twenty two haulings were immediately begun where the settings were finished and three haulings were done at the starting point of setting. Total of the 68,400 hooks were observed by the on-board observer.

Catches sampled by the observer were 39.4 mt of tuna and billfishes, of which bigeye tuna was the dominant tuna species accounting for 67.7% of the total catch in weight, followed by yellowfin tuna of 5.7mt (14.4%), and albacore of 1.7mt (4.4%). Billfishes incidentally caught were blue marlin (9.1%), swordfish (2.9%) and striped marlin (1.0%) (Table 2).

A total of 20 bycatch species (852 in number) were observed during the trip, among which billfishes, sharks, escolar and lancetfish were most common and some other fish species were also observed . In addition, one olive ridley turtle was caught aboard and released after biological measurement (Table 3).

Length frequency data for the sampled tuna and billfishes were collected. The fork length of bigeye tuna ranged from 40cm to 175cm (mean 122cm) and that of yellowfin tuna ranged from 40cm to 145cm (mean 108cm) with mode at 85cm and 125cm. On the other hand the fork length of albacore ranged from 45cm to 120cm (mean 110cm) with dominant small-sized fish (Fig. 3).

Table 2. Catch and CPUE of tunas and billfishes

Species	WCPO area					
	Catch				CPUE (/100hooks)	
	No.	%	Wt. (kg)	%	No	Kg
Bigeye tuna	648	59.2	26,698	67.7	0.95	39.0
Yellowfin tuna	231	21.3	5,679	14.4	0.34	8.3
Albacore	72	6.6	1,732	4.4	0.01	2.5
Skipjack	25	2.3	135	0.3	0.00	0.2
Blue marlin	65	6.0	3,567	9.1	0.10	5.2
Striped marlin	9	0.8	386	1.0	0.01	0.6
Swordfish	30	2.8	1,144	2.9	0.04	1.7
Shortbill pearfish	5	0.5	77	0.2	0.01	0.1
Total	1,085	100.0	39,418	100	1.58	57.6

Table 3. List of bycatch species (billfish not included)

Species	**WCPO area**	
	No. of fish	**%**
Bigeye thresher shark	30	3.5
Thresher shark	21	2.4
Longfin mako sshark	3	-
Blue shark	115	-
Silky shark	62	-
Oceanic white-tip shark	4	2.4
Galapagos shark	1	-
Crocodile shark	24	-
Palagic stingray	78	2.7
Sickle pomfret	16	0.9
Black pomfret	37	30.6
Escolar	106	7.8
Snake mackerel	49	2.0
Wahoo	70	5.8
Longnose lancetfish	161	4.7
Dolphin fish	76	2.0
Great barracuda	1	21.5

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Bluefin driftfish	1	0.6
Olive ridley sea turtle	1	0.4
Total	861	100

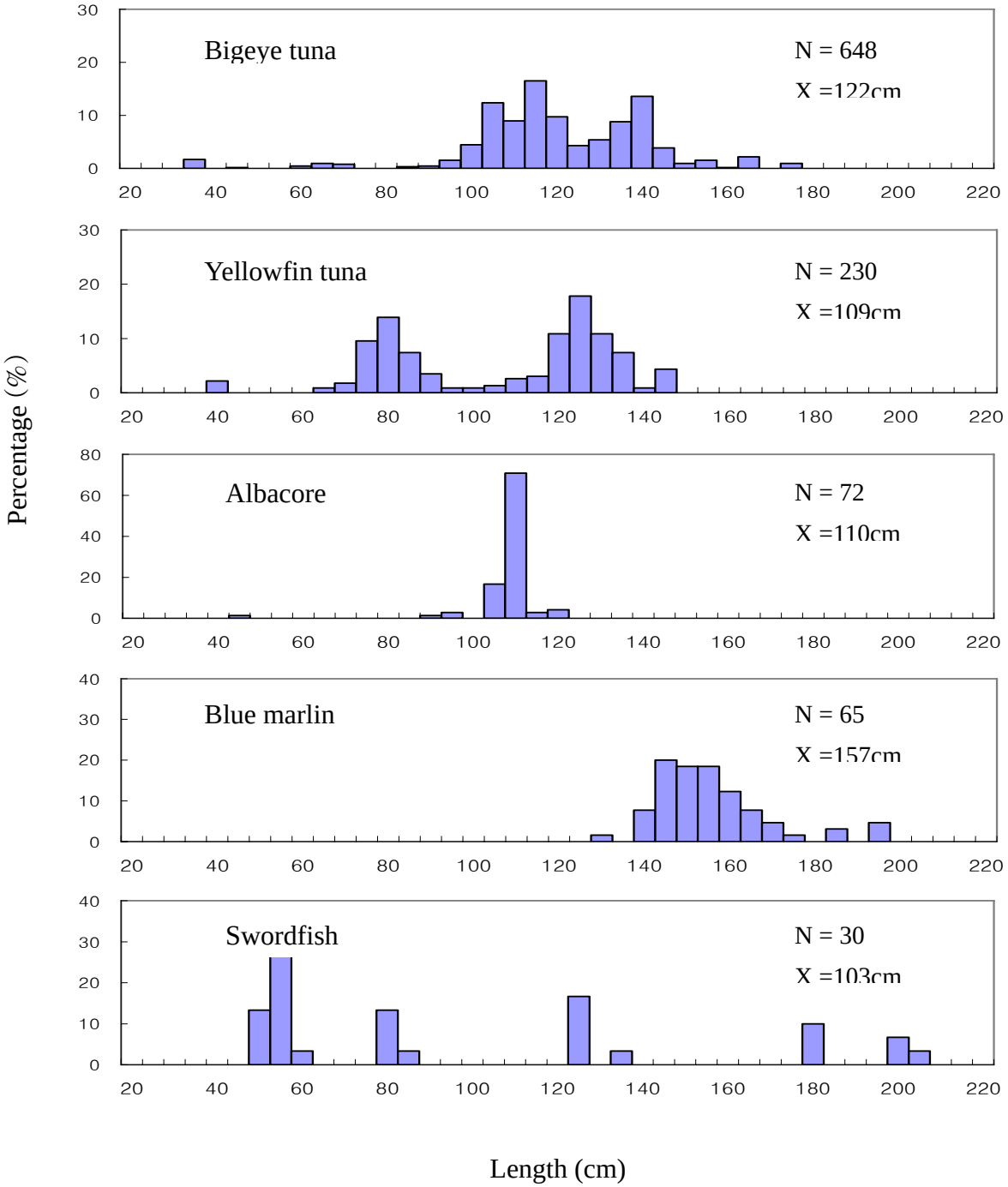

Fig. 3. Frequencies of fork length of tunas and eye to fork length (EFL) of billfishes in the WCPO area.