



**SCIENTIFIC COMMITTEE
SIXTH REGULAR SESSION**

10-19 August 2010

Nuku'alofa, Tonga

**Summary report of the Korean tuna fishery observer program for the WCPFC
Convention Area in 2009**

WCPFC-SC6-2010/EB-IP-11

Z.G. Kim, S.J. Hwang, J.B. Kim, D.N. Kim, D.W. Lee, and M.I. Han

National Fisheries Research and Development Institute (NFRDI)

Busan, Republic of Korea

Summary Report of the Korean Tuna Fishery Observer Program for the WCPFC Convention area in 2009

Zang Geun KIM, Seon Jae HWANG, Jong Bin KIM, Doo Nam KIM, Dong Woo LEE
and Myoung Il HAN

National Fisheries Research and Development Institute (NFRDI)

152-1 Haean-ro, Gijang-eup, Gijang-gun, Busan 619-900, Republic of Korea

Korea began to run observer program for distant-water fisheries including tuna fisheries in 2002. The purpose of the program was to meet the requirements of regional fisheries management organizations (RFMO) such as the WCPFC and so the mission of observer is similar to those set out in the Conventions of RFMOs. Before the official observer program was launched, Korea used to dispatch NFRDI scientists, when necessary, to commercial tuna vessels to monitor fishing operations and collect catch statistics including biological samples, which were unobtainable by regular data collection system. During the past 10 years, a total of 16 scientific observations have been made for tuna fisheries operating in the Western and Central Pacific where over 90% of Korean tuna catch has occurred. In 2009, three observers were deployed to monitor tuna fisheries in the WCPFC Convention area.

The Observation on Purse Seine Vessel

The Western and Central Pacific Ocean (WCPO) has been one of the major fishing grounds for the Korean tuna purse seine fishery since the early 1980s. To monitor this fishery, two trained observers were dispatched to two Korean tuna purse seine vessels targeting skipjack and yellowfin tuna from June to July in 2009. During the 93 days of the observation period, a total of 65 purse seine sets, 52 free-swimming school sets and 13 log-associated school sets were monitored in the waters near Kiribati and Tuvalu, between 1°S-8°S and 170°E-167°W (Table 1). The success rates of set operations by school type were 70% for free-swimming school sets and 100% for log-associated school sets. A total observed catch was 1,957 mt for target species and 16 mt for non-targeted, associated and dependent species. In regard to the catch composition for target species, 86.7% was skipjack and 13.3% was yellowfin tuna. Catch per unit effort (CPUE; mt/set) of free-swimming school set and log-associated school set was 31.1

mt/set and 27.6 mt/set on average, respectively.

Fifteen non-targeted species were caught from 13 log-associated school and 19 species from 52 free-swimming school sets. The dominant species caught by purse seiners were silky sharks, rainbow runners and ocean trigger fish. (Table 2).

Length frequency data of main tunas were also collected by the observers. A total of 1,542 skipjack, 1,658 yellowfin and 737 bigeye were measured onboard (Fig. 1 and 2). The fork length of skipjack, yellowfin tuna and bigeye tuna ranged 28-78 cm, 34-154 cm and 36-150 cm, respectively. As the continuation of a small-scale voluntary tagging program by NFRDI, the observers, in cooperation with fishers, placed conventional tags on 19 yellowfin tuna and 6 bigeye tuna and released them in 2009.

The Observation on Longline vessel

To monitor Korean tuna longline fisheries operated in the Pacific, one trained observer was deployed to a Korean longliner (416 GRT) fishing in the Pacific Ocean, between 12° N–5° S and 171°E-171°W.

During the 70 days of the observation period from April to July 2009, a total of 41 longline sets were monitored. The average number of baskets used for each set was 149 and the hooks used ranged from 2,520 to 3,696 (22 hooks per basket). The average length of the main line was 105 km and that of the buoy line was 50 m. The length of the branch lines was 40 m and a 10 meter-long lead line was used. The lead material was nylon monofilament which was 1.5mm in diameter. The longliner used no. 3.8 (J type) tuna hooks with baits of squids, mackerels and sardines.

Usually, longline setting began at around 8:00 in the morning and was put in operation until noon. After about 4 hours of operation, the lines were hauled until the following morning until 6:40 am. A total number of 36 haulings were immediately begun where the settings were finished and that of 5 haulings were done at the starting point of setting. A total number of 131,069 hooks were observed during the 41 sets.

Catches sampled by the observer were 44.2 mt of tuna and billfishes, of which yellowfin tuna was the dominant species accounting for 51.6 % of the total catch in weight, followed by albacore of 10.7 mt (34.5 %), and bigeye tuna of 5.9 mt (13.6 %). Among incidentally caught billfishes were blue marlins (9.6 %) and swordfish (0.5 %) (Table 3). A total of 15 non-targeted species (1,579 fishes in number) were observed during the trip, among which snake mackerels, pelagic stingrays, blue sharks and bigeye thresher sharks were most common and some other fish species were also observed (Table 4).

Length frequency data from the sampled tuna were also collected. The fork length ranged from 74 cm to 152 cm (mean 121.2 cm) for bigeye tuna, from 60 cm to 168 cm (mean 119.4 cm) for yellowfin tuna and from 74 cm to 143 cm (mean 96.7cm) for albacore. The eye to fork length of blue marlins ranged from 89 cm to 242 cm (mean 161.6 cm) (Fig. 3).

Table 1. Catch (mt) and CPUE (mt/set) by school types of the two purse seiners during the scientific observation in 2009

School type	No. of sets	No. of Success sets rate (%)	Skipjack		Yellowfin		Bigeye		Others		Total	
			Catch	CPUE	Catch	CPUE	Catch	CPUE	Catch	CPUE	Catch	CPUE
Free-swimming school	52	40 (77 %)	1,386.3	26.7	217.5	4.2	2.9	0.05	8.0	0.15	1,614.7	31.1
Log-associated school	13	13 (100 %)	310.0	23.8	43.1	3.3	4.5	0.34	1.0	0.08	358.5	27.6
Total	65	53	1,696.3	26.1	260.6	4.0	7.4	0.11	9.0	0.14	1973.2	30.4

Table 2. List of non-target species caught by school types by the two tuna purse seiners during the scientific observation in 2009

Species name	Free-swimming school		Log-associated school	
	Number	Weight (Kg)	Number	Weight (Kg)
Blue marlin	4	355.0		
Indo-pacific marlin	16	757.0		
Indo-pacific sailfish	1	30.0		
Silky shark	26	916.1	50	300.3
Whale shark	4	5,287.0		
Devil ray	8	455.0		
Pelagic stingray	1	2.0		
Banded cavalla			1	0.1
Brown leatherjacket			1	0.2
Bullet tuna	7	9.1	1	1.9
Butterfish			2	0.2
Dolphinfish	4	8.3	11	50.7
Figured leatherjacket			1	0.6
Flyingfish	1	0.5		
Great barracuda	4	38.2	1	13.0
Mackerel scad	1	0.3	46	10.9
Niddlefish	1	0.7	3	3.1
Ocean trigger fish	6	3.3	20	10.6
Rainbow runner	8	27.7	54	137.5
Shark sucker	1	1.1		
Sharptail mola	2	34.1	2	34.1
Unicorn leatherjacket			2	2.3
Wahoo	3	13.1	6	35.3
Olive ridley sea turtle	2	12.9		
Total	100	7,951.4	201	600.8
No. of species	19		15	

Table 3. Catch and CPUE of tuna and billfishes caught by the tuna longliner during the scientific observation in 2009

Species	Catch				CPUE	
	No.	Ratio (% in no.)	Weight (kg)	Ratio (% in weight)	No./100hooks	kg/100hooks
Bigeye tuna	191	10.71	5,989	13.56	0.15	4.57
Yellowfin tuna	833	46.69	22,766	51.53	0.64	17.37
Albacore	615	34.47	10,725	24.28	0.47	8.18
Blue marlin	110	6.17	4,253	9.63	0.08	3.24
Skipjack tuna	3	0.17	23	0.05	0.00	0.02
Swordfish	17	0.95	210	0.48	0.01	0.16
Shortbill spearfish	13	0.73	162	0.37	0.01	0.12
Striped marlin	1	0.06	30	0.07	0.00	0.02
Indo-Pacific sailfish	1	0.06	22	0.05	0.00	0.02
Total	1,784	100	44,180	100	1.36	33.71

Table 4. List of non-target species caught by the tuna longliner during the scientific observation in 2009

Species name	No. of fish	Ratio (% , no.)	CPUE(no./100hooks)
Longfin mako	4	0.25	0.00
Bigeye thresher shark	41	2.60	0.03
Blue shark	91	5.76	0.07
Oceanic white-tip shark shark	4	0.25	0.00
Silky shark	1	0.06	0.00
Pelagic stingray	187	11.84	0.14
Pomfret	2	0.13	0.00
Escolar	93	5.89	0.07
Snake mackerel	1,005	63.65	0.77
Wahoo	61	3.86	0.05
Lancetfish	77	4.88	0.06
Great barracuda	9	0.57	0.01
Dolphin fish	2	0.13	0.00
Slender sunfish	1	0.06	0.00
Rainbow runner	1	0.06	0.00
Total	1,579	100	1.20

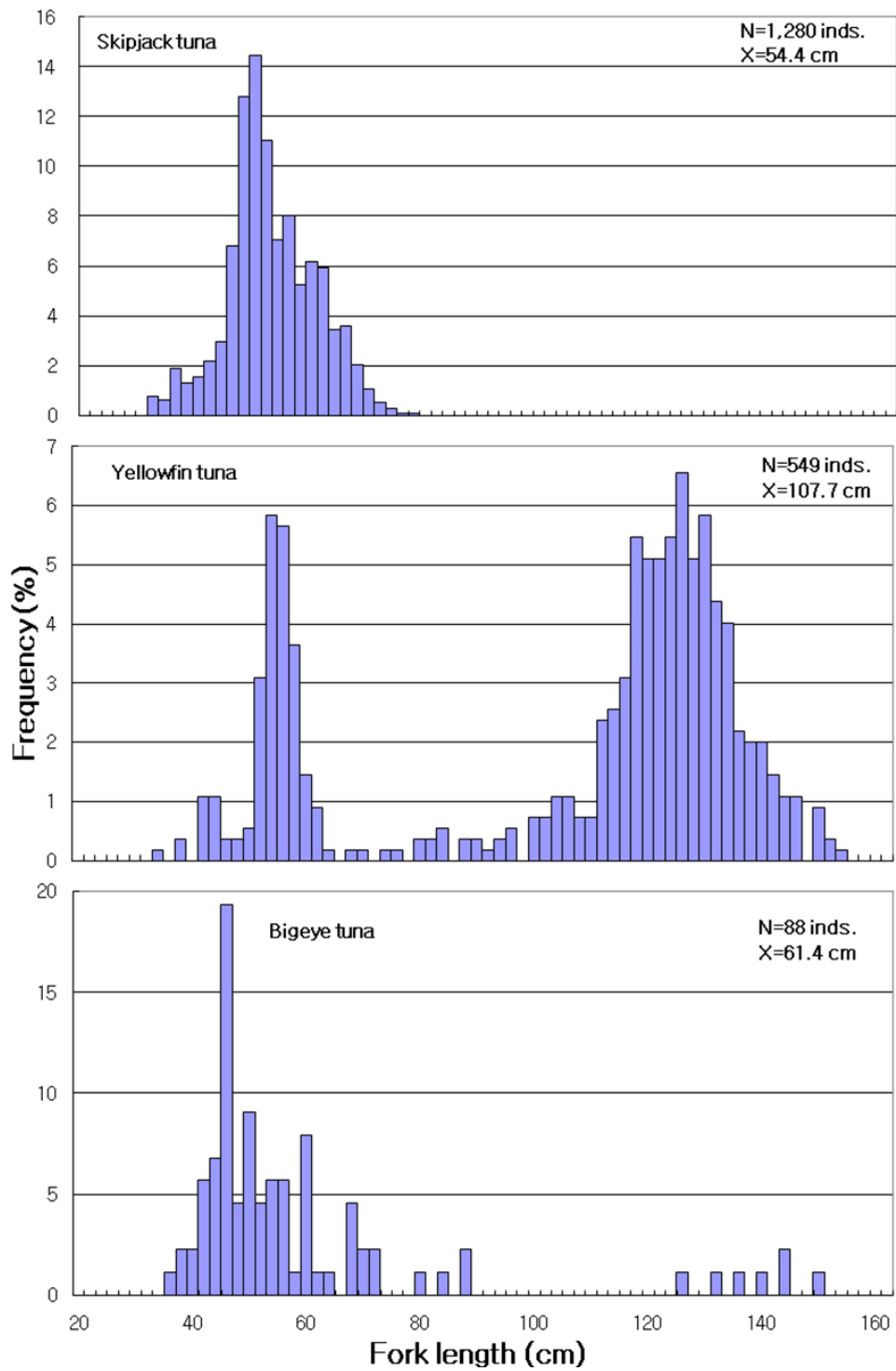


Fig. 1. Length frequency distributions of tuna by free-swimming school caught by the longliner during the scientific observation in 2009.

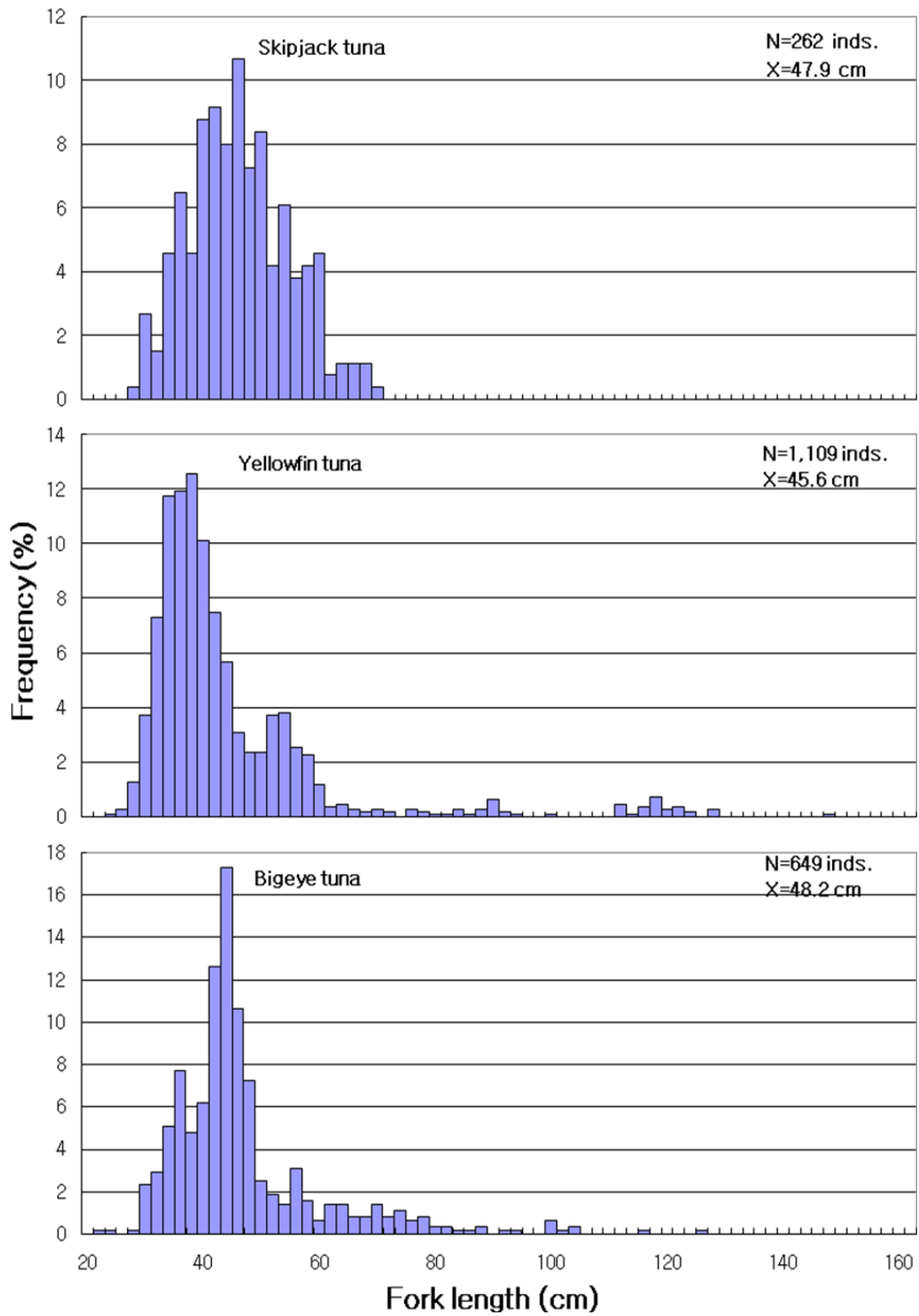


Fig. 2. Length frequency distributions of tunas by log-associated school caught by the longliner during the scientific observation in 2009.

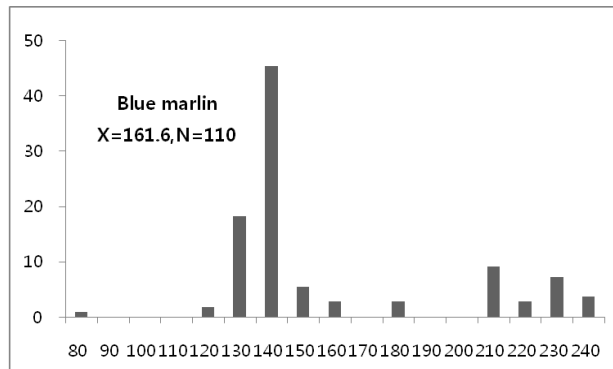
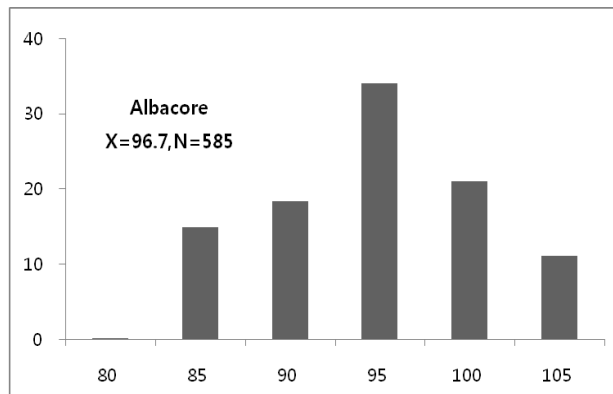
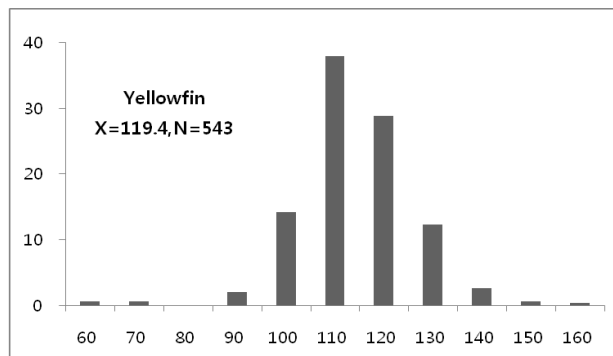
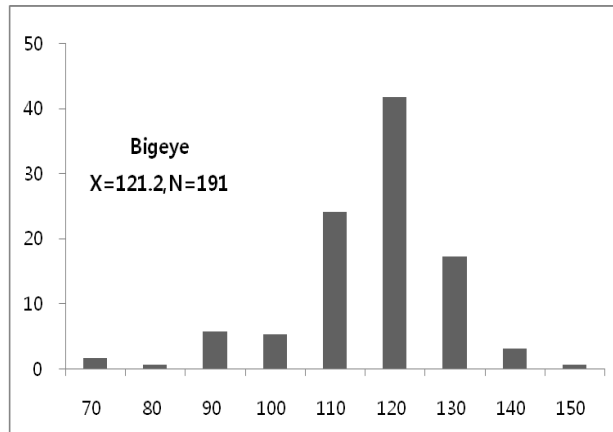


Fig. 6. Length frequency distributions of tuna and blue marlin caught by the longliner during the scientific observation in 2009.