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Review of Chinese scientific observer programme in the Pacific Ocean in 2010

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Abstract: During 2010, 4 observers are trained and dispatched to Chinese longline vessels in the high seas of Central and Eastern Pacific Ocean. Trip 1 covered the time period from Aug 26 to Dec 19, 2010, in the areas of N10°21′-S9°46′，E178°58′～W152°15′. Trip 2 covered the time period from Sep 25 to Jan 17, 2011, in the areas of S03°46′～S09°26′, W149°52′～W154°19′. Trip 3 covered the time period from Oct 2, 2010 to Jan 13, 2011, in the areas of N6°00′～S10°49′, W169°05′～W146°50. Trip 4 covered the time period from Oct 13, 2010 to Feb 19, 2011, in the areas of N4°38′～S14°45′，E178°01′～W130°07′. The observers collected all the data of catch captured by longline fishing gear. Observer also measured bycatch information including discards.

Key words: Observer program, Pacific Ocean. Catch, Biological information

In order to meet the requirements of regional fisheries management organizations (RFMO) such as the WCPFC, China have conducted four observer programs in the tuna longline fisheries in the Pacific Ocean in 2010. Observers are strictly trained for collecting fishery data of tunas and other pelagic fishes, including the size-frequency data of all pelagic fishes and bycatch information.to monitor tuna fisheries in the WCPFC Convention area.

The 1st observer trip

During the period from Aug 26, 2010 to Dec 19, 2010, one observer was deployed to a Chinese longline vessel (573 GRT), covering the areas N10°21′～S9°46′，E178°58′～W152°15′(Fig.5). During the 117 days of the observation period, a total of 91 longline sets were monitored. Average length of the main line was 150 km, length of the main line between the buoys was 901 m, length of the buoy line was 46 m, length of the branch lines was 55 m, distance between the branch lines was 53 m,

and the number of the branch lines was 16. Japan tuna hooks (4.0 inch, 5.3mm. AYA01005) were applied with baits of squids, mackerels and sardines. A total number of 240,988 hooks were observed during the 91 sets.

37 species of animals had been recorded in the present trip. Catches sampled by the observer were 76.3 mt of tuna and billfishes (2,194 individuals), among which bigeye tuna was the dominant species accounting for 56.2 % of the total catch in weight, followed by yellowfin tuna (27.4 %), swordfish (7.0 %), albacore (6.7 %) and blue marlins (2.7 %) (Table 1). A total of 32 non-targeted species (513 individuals) were observed during the trip (Table 2), including eight turtles, three of the turtles were dead, and the rest five of them were survived and released.

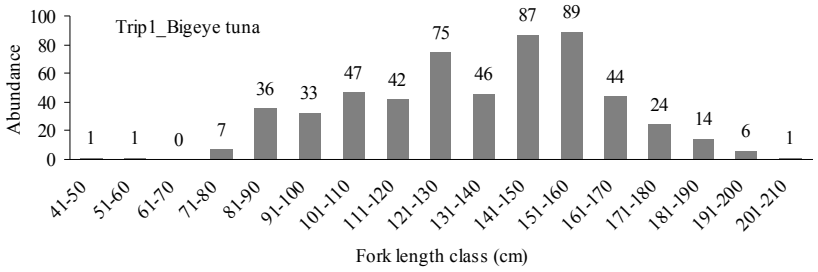
Table 1. Sanple of main pelagic species caught by the tuna longliner during the trip 1 scientific observation from Aug 26 to Dec 19, 2010.

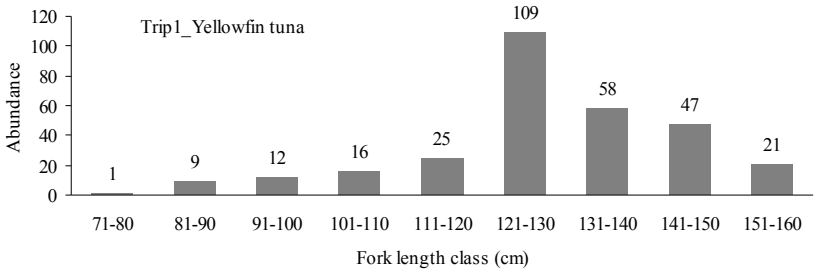
Species	No.	Ratio (% in no.)	Weight (kg)	Ratio (% in weight)
Bigeye tuna	1040	47.4	42870	56.2
Yellowfin tuna	706	32.2	20903	27.4
Albacore	286	13.0	5106	6.7
Swordfish	127	5.8	5324	7.0
Blue marlin	35	1.6	2058	2.7
Total	**2,194**	**100**	**76,261**	**100**

Table 2. List of non-target species caught by the tuna longliner during the trip 1 scientific observation from Aug 26 to Dec 19, 2010.

Species name	No. of fish	Ratio (% in no.)
Skipjiack tuna	24	4.7
Striped marlin	15	2.9
Shortbill spearfish	10	1.9
Indo-Pacific sailfish	1	0.2
Silky shark	37	7.2
Whitetip shark	46	9.0
Blue shark	35	6.8
Longfin mako	8	1.6
Black tip reef shark	2	0.4
Scalloped hammerhead	3	0.6
Bigeye thresher	19	3.7
Crocodile shark	9	1.8
Velvet dogfish	17	3.3

Sting ray	37	7.2
Wahoo	36	7.0
Escoler	61	11.9
Snake mackerel	19	3.7
Oilfish	2	0.4
Bigscale pomfret	70	13.6
Dagger pomfret	16	3.1
Dolphinfish	11	2.1
Lancetfishes	8	1.6
Opah	5	1.0
Sharp tailed sunfish	3	0.6
Sunfish	1	0.2
Truncated sunfish	6	1.2
Ribbonfish	1	0.2
Manta Ray	3	0.6
Leatherback turtle	2	0.4
Olive ridley sea turtle	1	0.2
Green turtle	4	0.8
Unknown turtle	1	0.2
Total	**513**	**100**





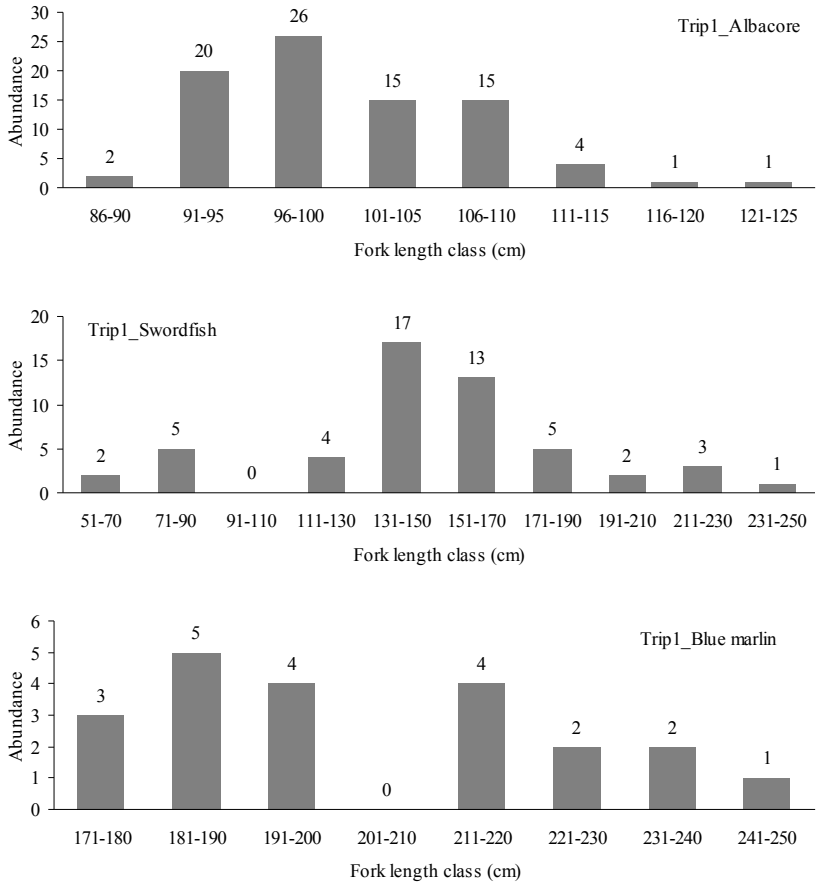


Figure 1 Length frequency distributions of tuna and billfish caught by the longliner during the scientific observation from Aug 26 to Dec 19, 2010.

As shown in figure 1, length frequency data from the sampled tuna were also collected. The bigeye tuna varied from 50 to 204 cm in fork length (mainly ranged at 80-170 cm) and from 5 to 135 kg in weight,; the yellowfin tuna varied from 79 to 160 cm in fork length (mainly ranged at 110-150 cm) and from 6 to 63 kg in weight; the albacore varied from 88 to 125 cm in fork length (mainly ranged at 90-110 cm) and from 10 to 29 kg in weight; the swordfish varied from 60 to 244 cm in low jaw fork length (mainly ranged at 110-190 cm) and from 6 to 159 kg in weight; the blue marlins varied from 172 to 250 cm in low jaw fork length and from 26 to 118 kg in and weight.

The 2nd observer trip

During the period from Sep 25, 2010 to Jan 17, 2011, one observer was deployed to a Chinese longline vessel (629 GRT), covering areas S03°46′～S09°26′, W149°52′～W154°19′(Fig. 6). During the 116 days of the observation period, a total of 99 longline sets were monitored. Length of the main line between the buoys was 900 m, length of the buoy line was 45 m, length of the branch lines was 50 m, distance between the branch lines was also 50 m, and the number of the branch lines was 17. Milkfish, mackerels and plastic squids were applied as baits. A total number of 287,142 hooks were observed during the 99 sets.

28 species of animals had been recorded in the present trip. Catches sampled by the observer were 93.4 mt of tuna and billfishes (2,432 individuals), among which bigeye tuna was the dominant species accounting for 63.0 % of the total catch in weight, followed by yellowfin tuna (23.3 %), swordfish (5.6 %), albacore (4.8 %) and blue marlins (3.3 %) (Table 3). A total of 23 non-targeted species (306 individuals in number) were observed during the trip (Table 4). No turtle was recorded during this observer trip.

Table 3 Catch of target species caught by the tuna longliner during the trip 2 scientific observation from Sep 25, 2010 to Jan 17, 2011.

Species	No.	Ratio (% in no.)	Weight (kg)	Ratio (% in weight)
Bigeye tuna	1326	54.5	58887	63.0
Yellowfin tuna	708	29.1	21754	23.3
Albacore	240	9.9	4495	4.8
Swordfish	107	4.4	5263	5.6
Blue marlin	51	2.1	3045	3.3
Total	**2,432**	**100**	**93,444**	**100**

Table 4 List of non-target species caught by the tuna longliner during the trip 2 scientific observation from Sep 25, 2010 to Jan 17, 2011.

Species name	No. of fish	Ratio (% in no.)
Skipjack tuna	3	1.0
Striped marlin	11	3.6
Shortbill spearfish	21	6.9
Atlantic Sailfish	2	0.7

Silky shark	5	1.6
Blue shark	61	19.9
Shortfin mako shark	1	0.3
Oceanic whitetip shark	5	1.6
Bigeye thresher	1	0.3
Crocodile shark	6	2.0
Cookie cutter shark	3	1.0
Lancetfishes	9	2.9
Bigscale pomfret	30	9.8
Dagger pomfret	4	1.3
Dolphinfish	7	2.3
Opah	12	3.9
Wahoo	30	9.8
Escoler	73	23.9
Snake mackerel	13	4.2
Spinetail mobula	1	0.3
Sunfish	1	0.3
Tapertail ribbonfish	5	1.6
Truncated sunfish	2	0.7
Total	**306**	**100**

As shown in figure 2, length frequency data from the sampled tuna were also collected. The bigeye tuna varied from 73 to 198 cm in fork length (highest abundance occurs at the fork length 120-160) and from 4 to 137 kg in weight; the yellowfin tuna varied from 79 to 171 cm in fork length (mainly ranged at100-150 cm) and from 8 to 77 kg in weight; the albacore varied from 70 to 118 cm in fork length (mainly ranged at 90-110 cm) and from 15 to 25 kg in weight; the swordfish varied from 72 to 266 cm (mainly ranged between 130-210 cm) in the lower jaw to fork length and from 2 to 150 kg in weight; and the blue marlins varied from 164 to 250 cm in the lower jaw to fork length (mainly ranged at 180-230 cm) and from 30 to 120 kg in weight.

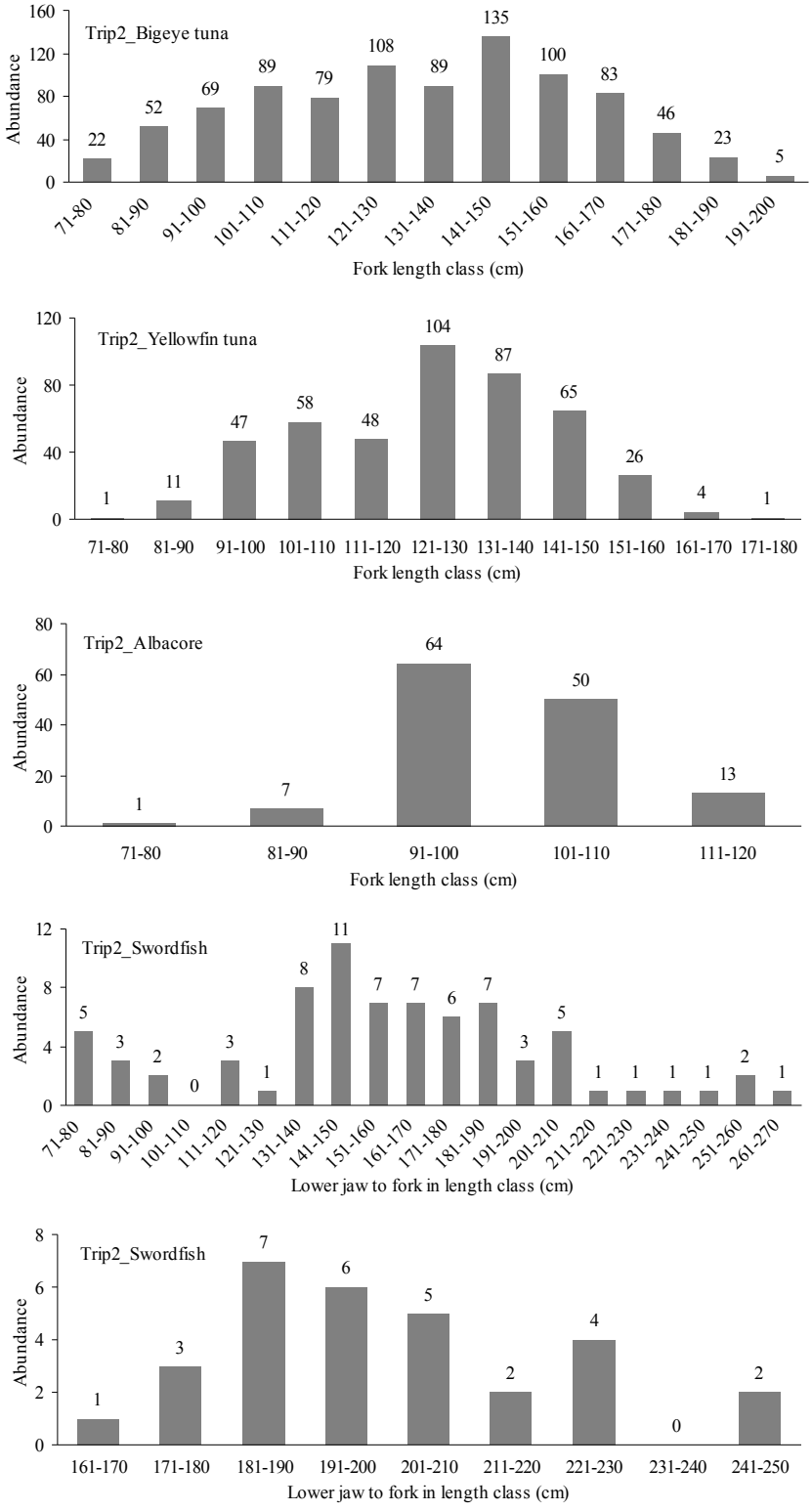


Figure 2 Length frequency distributions of tuna and billfish caught by the longliner during the scientific observation from Sep 25, 2010 to Jan 17, 2011.

The 3rd observer trip from Oct 2, 2010 to Jan 13, 2011

During the period from Oct 2, 2010 to Jan 13, 2011, one observer was deployed to a Chinese longline vessel (619 GRT), covering the areas of N6°00′～S10°49′，W169°05′～W146°50(Fig.7). During the 105 days of the observation period, a total of 86 longline sets were monitored. Average length of the main line was 150 km. Length of the main line between the buoys was 860 m, distance between the branch lines was also 43 m, and the number of the branch lines was 19. Mackerels and squids were applied as baits. A total number of 241,110 hooks were observed during the 86 sets.

32 species of animals had been recorded in the present trip. Catches sampled by the observer were 76.9 mt of tuna and billfishes (2,108 individuals), among which bigeye tuna was the dominant species accounting for 68.9 % of the total catch in weight, followed by yellowfin tuna (14.7 %), swordfish (6.4 %), albacore (4.2 %) and blue marlins (5.8 %) (Table 5). A total of 27 non-targeted species (379 individuals in number) were observed during the trip (Table 6), including two leatherback turtles, both survived after removal of hooks.

Table 5 Sample of main pelagic species caught by the tuna longliner during the trip 3 scientific observation from Oct 2, 2010 to Jan 13, 2011.

Species	No.	Ratio (% in no.)	Weight (kg)	Ratio (% in weight)
Bigeye tuna	1341	63.6	52981	68.9
Yellowfin tuna	424	20.1	11273	14.7
Albacore	180	8.5	3254	4.2
Swordfish	86	4.1	4882	6.4
Blue marlin	77	3.7	4461	5.8
Total	**2,108**	**100**	**76,851**	**100**

Table 6 List of non-target species caught by the tuna longliner during the trip 3 scientific observation from Oct 2, 2010 to Jan 13, 2011.

Species name	No.	Ratio (% in no.)
Skipjiack tuna	12	2.0
Lancetfishes	1	0.2
Opah	14	2.3

Dagger pomfret	12	2.0
Bigscale pomfret	81	13.4
Snake mackerel	2	0.3
Escoler	100	16.5
Oilfish	2	0.3
Wahoo	79	13.1
Dolphinfish	16	2.6
Velvet dogfish	1	0.2
Crocodile shark	17	2.8
Bigeye thresher	18	3.0
Shortfin mako	4	0.7
Longfin mako	2	0.3
Blue shark	73	12.1
Oceanic whitetip shark	59	9.8
Silky shark	57	9.4
Sting ray	9	1.5
Spinetail mobula	1	0.2
Truncated sunfish	2	0.3
Rough pomfret	2	0.3
Great barracuda	2	0.3
Tapertail ribbonfish	1	0.2
Striped marlin	9	1.5
Shortbill spearfish	27	4.5
Leatherback turtle	2	0.3
Total	**379**	**100**

As shown in figure 3, length frequency data from the sampled tuna and billfish were also collected. The bigeye tuna varied from 60 to 211 cm in fork length (mainly ranged at 100-180 cm) and from 5 to 166 kg in weight; the yellowfin tuna varied from 77 to 169 cm in fork length (mainly ranged at 91-160 cm) and from 11 to 67 kg in weight; the albacore varied from 93 to 112 cm in fork length and from 13 to 29 kg in weight; the swordfish varied from 51 to 263 cm in the lower jaw fork length (mainly ranged at 131-210 cm) and from 3 to 175 kg in weight; and the blue marlins varied from 165 to 268 cm in the lower jaw to fork length (mainly ranged at 180-210 cm) and from 26 to 152 kg in weight.

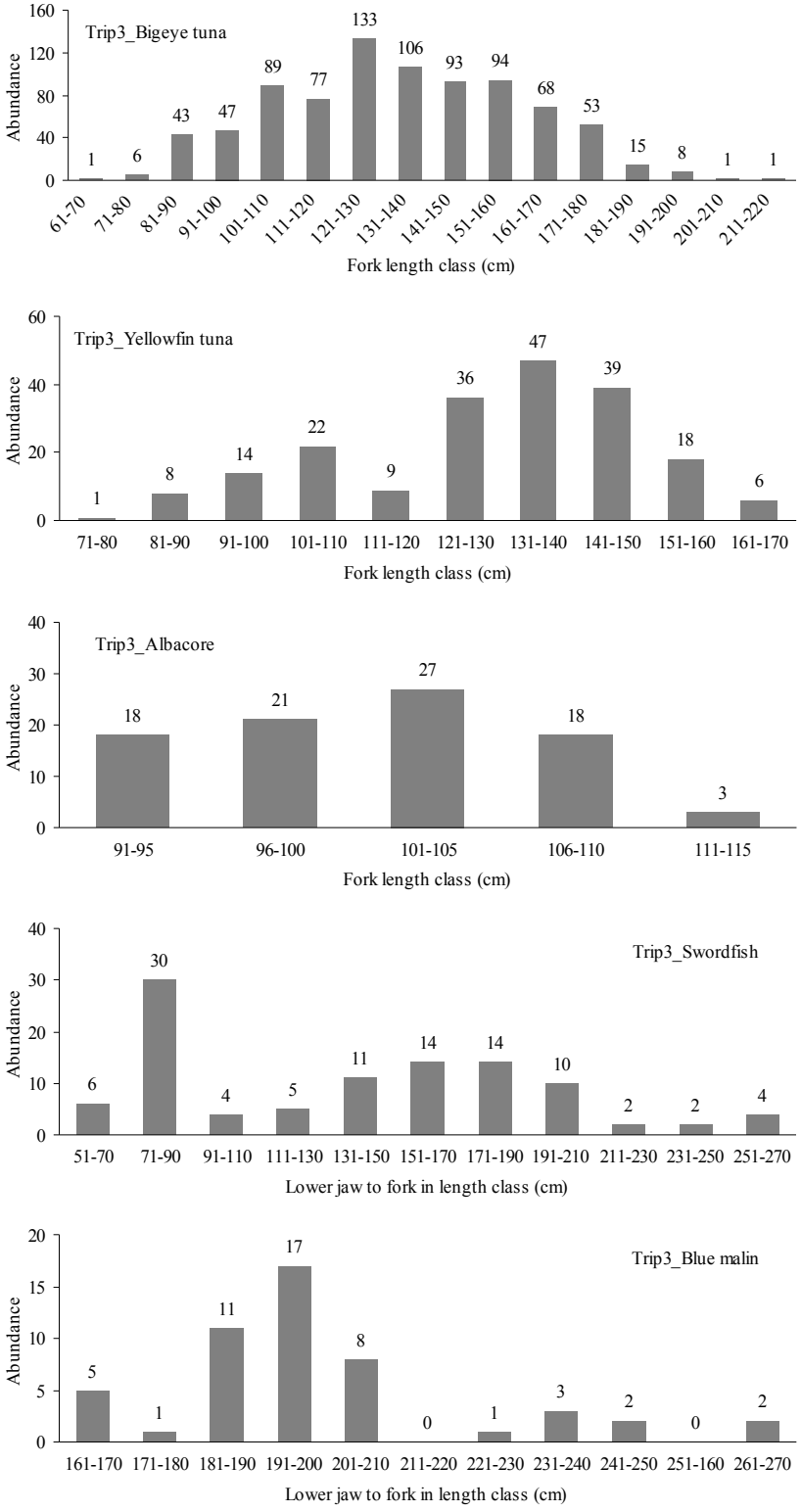


Figure 3 Length frequency distributions of tuna and billfish caught by the longliner during the scientific observation from Oct 2, 2010 to Jan 13, 2011.

The 4th observer trip from Oct 13, 2010 to Feb 19, 2011

During the period from Oct 13, 2010 to Feb 19, 2011, one observer was deployed to a Chinese longline vessel (613 GRT), covering the areas of N4°38′～S14°45′, E178°01′～W130°07′(Fig.8). During the 128 days of the observation period, a total of 93 longline sets were monitored. Average length of the main line was 150 km. Length of the main line between the buoys was 918 m, length of the buoy line was 47 / 45 / 42 m, length of the branch lines was 55 m, distance between the branch lines was 51 m, and the number of the branch lines was 16. Mackerels and milkfish were applied as baits. A total number of 250,359 hooks were observed during the 93 sets.

27 species of animals had been recorded in the present trip. Catches sampled by the observer were 523 individuals of tuna and billfishes, among which bigeye tuna was the dominant species accounting for 67.3 % of the total catch in number, followed by yellowfin tuna (14.7 %), swordfish (8.8 %) and albacore (5.0 %). Incidentally caught billfishes were blue marlins (4.2 %) (Table 7). A total of 22 non-targeted species (142 individuals in number) were observed during the trip (Table 8), including two turtles, which survived after removing the hooks.

Table 7 Catch of target species caught by the tuna longliner during the trip 4 scientific observation from Oct 13, 2010 to Feb 19, 2011.

Species name	No.	Ratio (% in no.)
Bigeye tuna	352	67.3
Yellowfin tuna	77	14.7
Albacore	46	8.8
Swordfish	26	5.0
Blue marlin	22	4.2
Total	**523**	**100**

Table 8 List of non-target species caught by the tuna longliner during the trip 4 scientific observation from Oct 13, 2010 to Feb 19, 2011.

Species name	No.	Ratio (% in no.)
Skipjack tuna	7	4.9
Lancetfishes	3	2.1

Opah	5	3.5
Dagger pomfret	8	5.6
Bigscale pomfret	17	12.0
Snake mackerel	11	7.7
Escoler	4	2.8
Oilfish	1	0.7
Wahoo	8	5.6
Dolphinfish	3	2.1
Crocodile shark	16	11.3
Bigeye thresher	4	2.8
Shortfin mako	5	3.5
Longfin mako	1	0.7
Blue shark	35	24.6
Sting ray	6	4.2
Spinetail mobula	2	1.4
Truncated sunfish	2	1.4
Short-finned pilot whale	1	0.7
Bigeye sand tiger	1	0.7
Leatherback turtle	1	0.7
Olive ridley turtle	1	0.7
Total	**142**	**100**

As shown in figure 4, length frequency data from the sampled tuna were also collected. The bigeye tuna varied from 50 to 230 cm in fork length (mainly ranged at 120-190 cm) and from 5 to 135 kg in weight; the yellowfin tuna varied from 90 to 170 cm in fork length (mainly ranged between 120-160 cm) and from 6 to 63 kg in weight; the albacore varied from 70 to 110 cm in fork length (mainly ranged at 90-110 cm) and from 10 to 29 kg in weight; the swordfish varied from 60 to 244 cm in fork length (mainly ranged at 114-181 cm) and from 6 to 159 kg in weight; the blue marlins varied from 172 to 250 cm in fork length and from 26 to 118 kg in and weight.

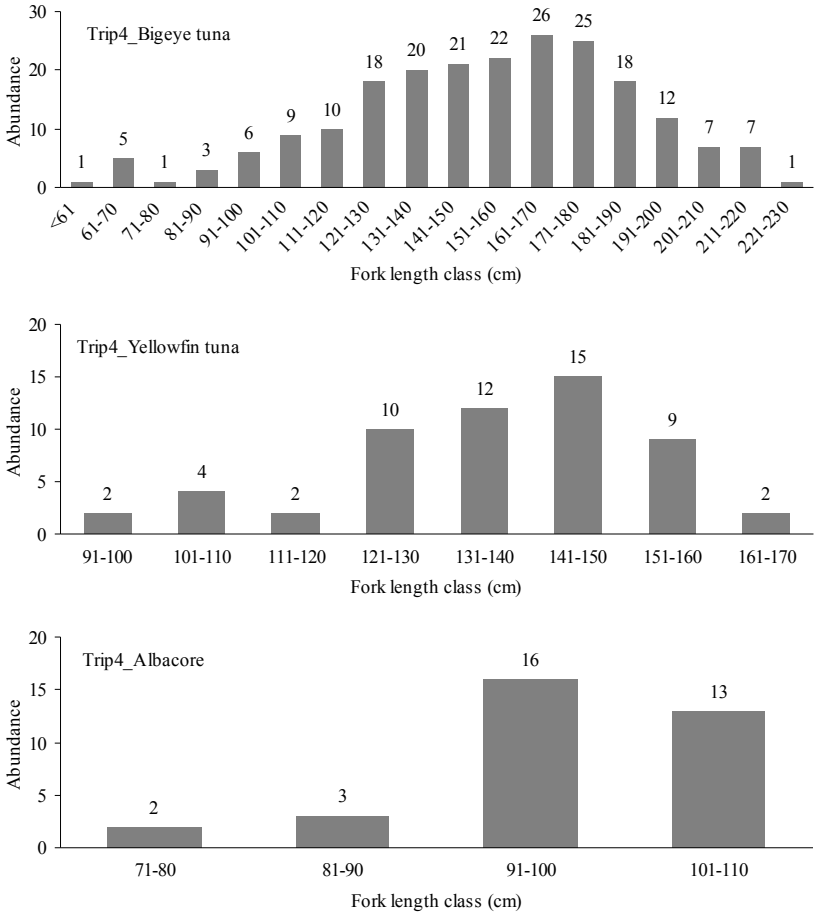


Figure 4 Length frequency distributions of tuna caught by the longliner during the scientific observation from Oct 13, 2010 to Feb 19, 2011.

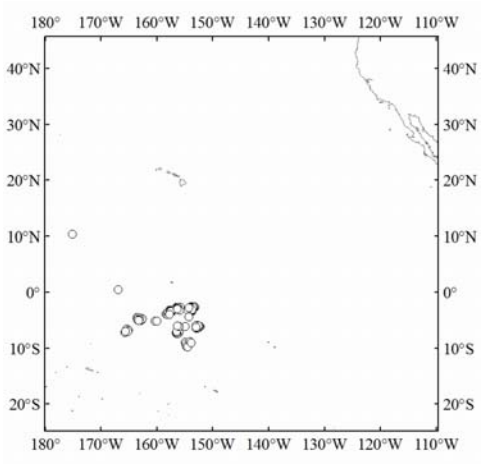


Fig. 5 Survey areas of 1st observer trip

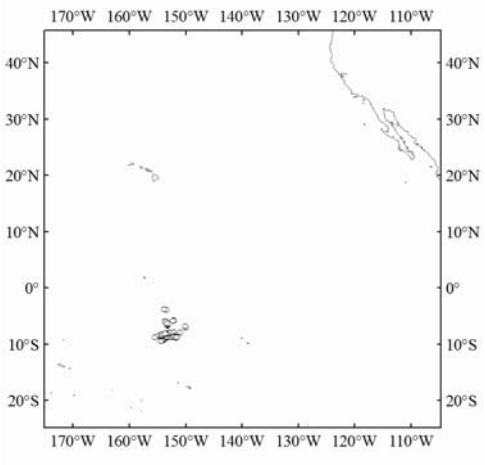


Fig.6 Survey areas of 2nd observer trip

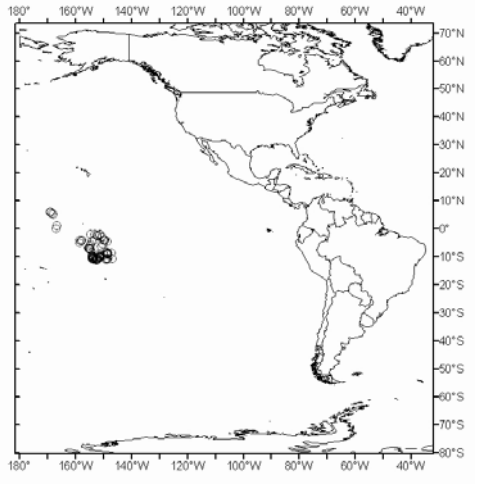


Fig. 7 Survey areas of 3rd observer trip

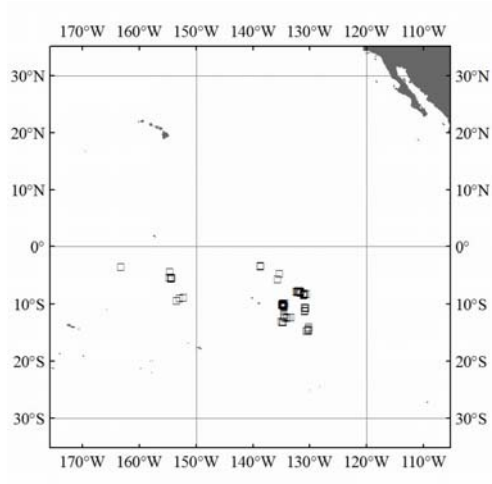


Fig.8 Survey areas of 4th observer trip