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National Report of Chinese Taipei to the SIOFA Scientific Committee, 2024

Chinese Taipei

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Abstract	<p>Oilfish, including <i>Ruvettus pretiosus</i> and <i>Lepidocybium flavobrunneum</i>, was identified as bycatch of Taiwanese large-scale tuna longline fleet prior to 2005. Parts of tuna longliners shifted to the southwest Indian Ocean for fishing oilfish seasonally after 2005 to obtain extra earnings. The numbers of longliners fished for oilfish seasonally were between 9 to 51 from 2000 to 2023, and there were 47 authorized ones fishing for oilfish within SIOFA area in 2023. The averaged catch in recent 5 years (2019 to 2023) was at around 5,408 mt.</p>

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Recommendations

- **That the Scientific Committee considers the National Report provided by Chinese Taipei**

2023 Annual National Report of Chinese Taipei to the SIOFA SC

1. Description of fishery

Oilfish, including *Ruvettus pretiosus* (OIL) and *Lepidocybium flavobrunneum* (LEC), was bycatch species of Taiwanese large-scale (larger than 100GRT) tuna longline fleet prior to 2005, which was mainly harvested by longliners targeting albacore in the south-west Indian Ocean, area of south of 25°S and west of 60°E. Due to the decrease of profit margins, some tuna longliners started shifting to the south-west Indian Ocean for fishing oilfish seasonally after 2005 to obtain extra earnings. The numbers of longliners fished for oilfish seasonally were between 9 to 51 between 2000 and 2023, and there were 47 tuna longliners authorized fishing for oilfish within SIOFA area in 2023.

Oilfish has biological characteristics of daily vertical migration from mesopelagic zone to epipelagic zone at night for foraging, so the fishing vessels start casting hooks to waters of 100 m to 150 m deep to fish oilfish after sunset. The gear configurations of oilfish and tropical tuna fisheries are similar with few differences, which include shorten float lines deployed, only finfish bait used and the usage of wire leader of oilfish longline fishery.

1.1. Fleet composition

Oilfish longline fishery is the only one fishery that conducted by Taiwanese fishing vessels operating in the SIOFA area, and the fishing fleet in past comprises of some large-scale tuna longliners seasonally shifting fishing ground to the southwest Indian Ocean to target oilfish. Starting from 2020, some small-scale tuna longliners has been authorized to target oilfish. The details of the number of annual active fishing vessels fishing for oilfish from 2019 to 2023 were listed in Table 1.

Table 1. The number of active oilfish fishing vessels in various scales from 2019 to 2023

Vessel Size (GRT) \ Year	2019	2020	2021	2022	2023
<100	0	7	8	9	12
100-200	2	2	2	2	2
200-500	28	31	26	24	29
500-1000	12	11	13	2	4
Total	42	51	49	37	47

2. Catch, effort and CPUE

2.1 Catch and effort

The summary of effort and catch of Taiwanese oilfish longline fishery from 2019 to 2023 were shown in the Table 2 and Table 3, respectively. It was observed that sub-area 1, 2 and 3.b were the oilfish core fishing grounds for Taiwanese oilfish longline fishing fleet with higher effort and catch, and the oilfish catch of 2022 resumed form the lower catch level of 2021. It should be noted that the numbers of effort and catch of 2022 should be deemed as preliminary values and needed further verified.

Although there were substantial efforts deployed in sub-area 3.a, 6, 7 and 8, the oilfish catches of these sub-areas were lower because these sub-areas were not the oilfish fishing ground and those fishing vessels operating in sub-area 3.a, 6, 7 and 8 were targeting tuna-like species. Oilfish was identified as bycatch of these Taiwanese longliners operations. For the target species in these regions, sub-area 8 is the fishing ground for tropical tuna and albacore; sub-area 3.a is the fishing ground for albacore; sub-area 6, and 7 are the fishing grounds for albacore and southern bluefin tuna.

Table 2. Summary of Taiwanese oilfish longline fishery effort

Year	Sub-areas for reporting effort data (unit: hook)									
	1	2	3.a	3.b	4	5	6	7	8	Total
2019	6,533,928	1,877,959	906,370	6,264,052	104,500	187,250	3,356,748	127,300	3,787,688	23,145,795
2020	12,248,058	1,732,180	802,145	4,067,159	162,820	106,600	1,316,486	0	1,395,090	21,830,538
2021	8,904,825	3,952,779	470,610	3,080,996	296,940	0	897,001	0	1,902,929	19,506,080
2022	5,721,045	1,346,309	535,934	4,245,334	174,274	308,688	648,954	537,300	1,477,355	14,995,193
2023	5,231,452	725,100	335,440	11,970,893	60,800	53,200	638,220	82,840	1,037,608	20,135,553

Table 3. Summary of Taiwanese oilfish longline fishery catch by species

Year	Sub-areas for reporting catch data (unit: mt)																			Total
	1		2		3.a		3.b		4		5		6		7		8			
	OIL	LEC	OIL	LEC	OIL	LEC	OIL	LEC	OIL	LEC	OIL	LEC	OIL	LEC	OIL	LEC	OIL	LEC		
2019	886.21	839.88	45.19	132.43	0.95	14.96	1,821.04	529.76	0.07	0.85	0.06	0.79	7.38	54.64	0.12	0.21	4.52	98.31	4,437	
2020	3,463.03	1,733.29	11.97	65.25	1.80	8.72	1,060.60	417.87	1	4.56	0.34	1.04	3.49	31.50	0	0	0.98	27.51	6,833	
2021	1,030.77	595.88	30.63	138.56	0.39	11.94	636.78	195.69	0.92	6.20	0	0	1.33	22.07	0	0	1.85	40.48	2,713	
2022	1,128.78	944.53	7.31	80.20	0.54	11.63	1,715.09	691.45	0.68	2.08	1.05	2.61	1	10.44	1	3.58	3.22	43.79	4,649	
2023	704.09	729.18	9.44	37.45	0.53	8.87	5,062.15	1,766.84	0.06	0.98	0.12	7.48	1.36	17.45	0.09	0.11	3.08	61.92	8,411	

2.2 Catch by species

The catch for main target, bycatch, associated and dependent species of Taiwanese oilfish longline fishery from 2019 to 2023 were shown in Table 4. The category of TUN includes albacore, bigeye tuna, yellowfin tuna, Southern bluefin tuna, skipjack and other tunas. The category of BIL includes swordfish, striped marlin, blue marlin, black marlin, sailfish, shortbill spearfish and other marlins. Blue shark is the main species in the SKX category.

Table 4. Catch by species for main target, bycatch, associated and dependent species (mt)

Year	TUN		BIL		SKX		Others	
	R	D	R	D	R	D	R	D
2019	4,629	37	963	0	763	1	297	0
2020	3,480	17	863	0	526	0	183	0
2021	5,421	67	597	0	578	0	223	0
2022	3,071	6	607	0	501	0	158	0
2023	3,492	21	585	0	916	0	204	0

2.3 CPUE

The nominal CPUE (kg/1000 hooks) trend by species between 2019 and 2023 was shown in Figure 1 to Figure 1(b), it should be noted that the data of 2023 is still in preliminary status and probably would be revised after data verification. The nominal CPUE of Oilfish (pooled OIL and LEC) is 191 kg/1000 hooks in 2019 and increased to 312 kg/1000 hooks in 2020, then down to 139 kg/1000 hooks in 2021. After that the CPUE trend increased and reached the highest value (417 kg/1000 hooks) in 2023. The CPUE trend still fluctuate up and down in the period of 2019 to 2023. The CPUE decreased to 139 kgs/1000 hooks in 2021 and the trend increased to 310 kgs/1000 hooks in 2022 and with the preliminary data, the CPUE increased to 417 kg/1000 hooks in 2023. While splitting of the nominal CPUE trend by species, the pattern remained the similarity with the pooled trend.

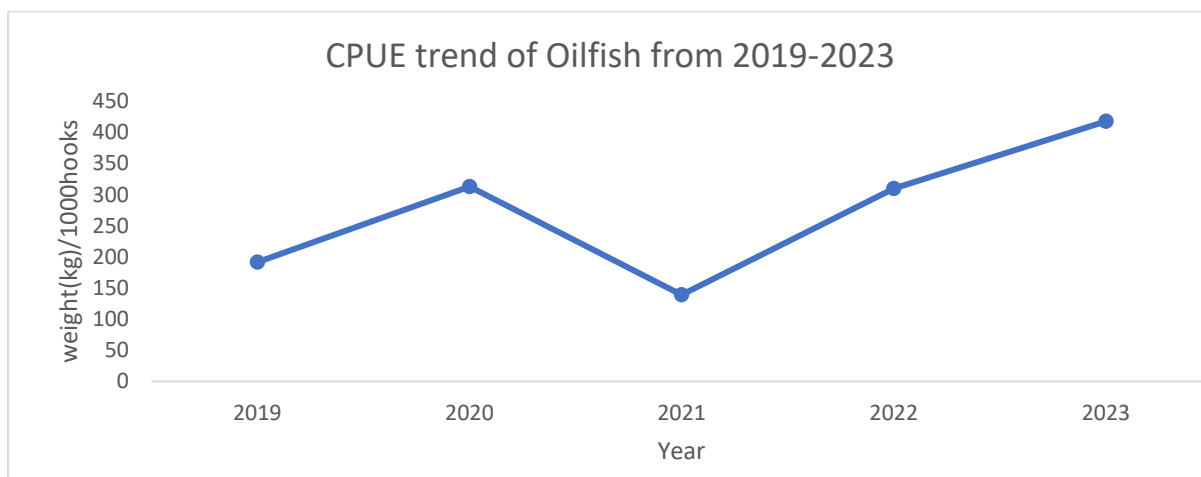


Figure 1. The Nominal CPUE trend of oilfish (including OIL and LEC) from 2019 to 2023 with Taiwanese longliner data.

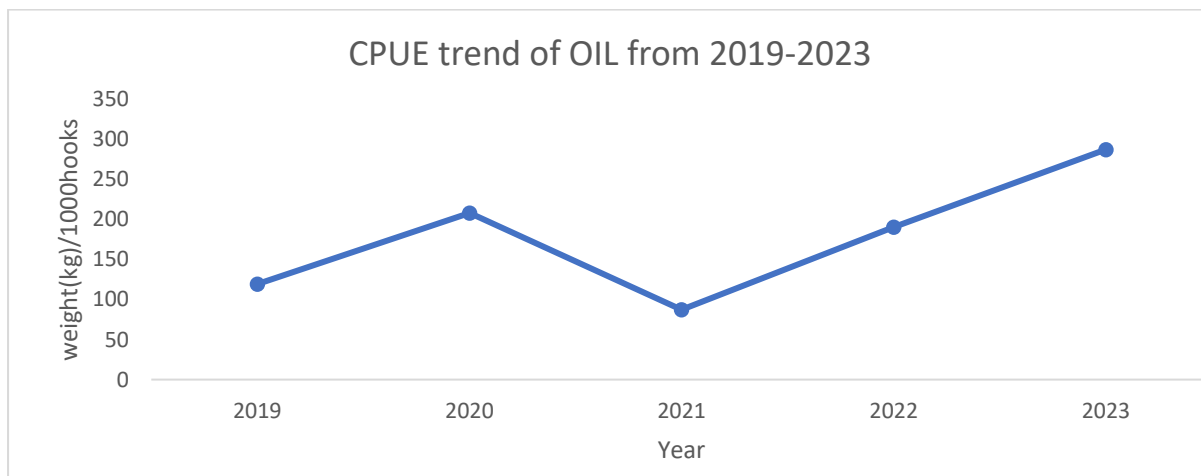


Figure 1(a). The Nominal CPUE trend of OIL from 2019 to 2023 with Taiwanese longliner data.

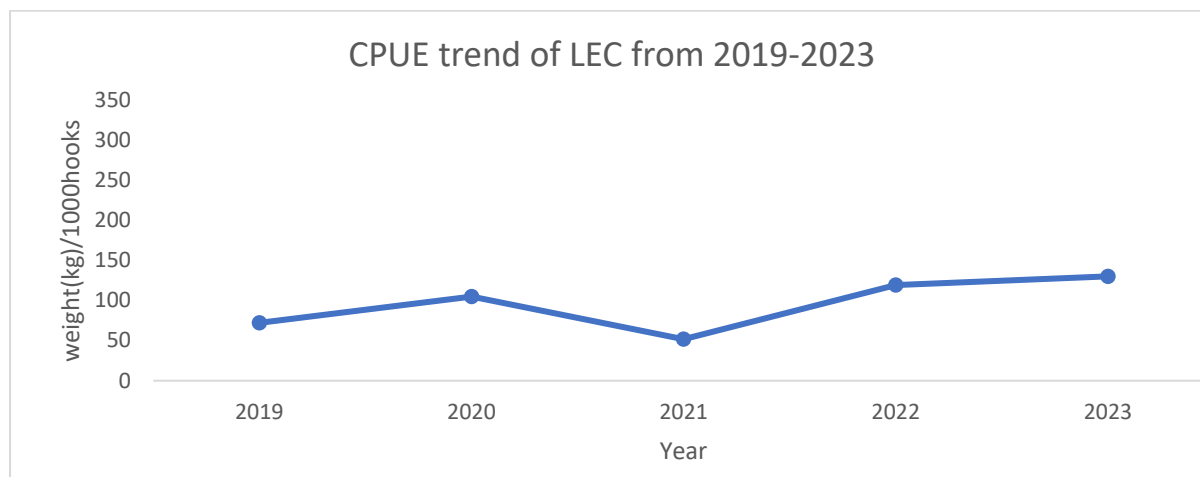


Figure 1(b). The Nominal CPUE trend of LEC from 2019 to 2023 with Taiwanese longliner data.

3. Fishery data collection and research activities

3.1 Fishery data collection

For the purpose of collecting fishery data in a real time manner completely, all fishing vessels operating outside the EEZ of Taiwan are required to report their fishing data via e-logbook daily with size measurements of the first 30 fish caught.

Because the oilfish longline fishing fleet are tuna longliners seasonally shifting operations, they use the same e-logbook to report fishery data. The data fields in electronic logbook are fully conformed to IOTC Res. 15-01 and WCPFC CMM 2013-05 on the recording of catch and effort data by fishing vessels. The details on the scales and resolutions of the fishery data collection in electronic logbook of Taiwanese tuna longline fishery were listed in Table 5.

Table 5: Details of the scales and resolutions of the fishery data collection

Oilfish longline fishery data collection items on logbook				
Year	tow / set (<i>individual or some aggregation</i>)	time scale (<i>set-tow hauling time, daily, etc.</i>)	spatial scale (<i>tow/set exact position or grid, please provide grid resolution</i>)	species details (<i>any aggregation or species grouping</i>)
2016-2023	Set	daily	Exact position to minute of hauling start position	Albacore, Bigeye tuna, Yellowfin tuna, Southern bluefin tuna, Skipjack, Swordfish, Striped marlin, Blue marlin, Black marlin, Sailfish, Shortbill spearfish, Blue shark, Silky shark, Oceanic whitetip shark, Shortfin mako shark, Longfin mako shark, Thresher shark, Bigeye thresher shark, Pelagic thresher shark, Winghead hammerhead shark, Smooth hammerhead

				shark, Scalloped hammerhead shark, Crocodile shark, Tiger shark, Great white shark, Kawakawa, Frigate tuna, Bullet tuna, Longtail tuna, Indo-Pacific king mackerel, Narrow-barred Spanish mackerel, Mahi mahi, Castor (oilfish), Escolar (oilfish), Wahoo, Moonfish, Promfret, Mola mola, Other tuna, Other marlins, Other shark, Other fish, Sea turtle, Sea bird, Whales and dolphin
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The operator or the captain of any fishing vessel intending to land or tranship are mandatory to fill in the Landing/Transshipment Notice and submit it to the competent authority for approval. Moreover, after the completion of landing or transshipment, the operator or the captain are mandatory to submit the Landing/Transshipment Declaration to the competent authority.

3.2 Research activities

For improving stock assessment of highly migratory species in the Indian Ocean, government of Taiwan has commissioned scientists to conduct research in recent years as follows :

- Studies on population dynamics of tunas, billfishes and sharks in the Indian Ocean.
- Analyses on bycatch of Taiwanese distant water tuna longline fisheries.
- Feasibility analyses on the fishing condition forecast of tunas for the Taiwanese tuna longline fishery in Indian Ocean.
- The studies related stock status and productive biology of southern bluefin tuna, oilfish and escolar.

4. Biological sampling and length/age composition of catches

The size data collected by oilfish longline fishing vessels from 2019 to 2023 annually was shown in Table 6, Figure 2 and Figure 3, it should be noted that the length measurements of oilfish recorded in e-logbook without species information. The sampling rates ranged between 4.75% to 8.33% in these 5 years. It is observed that the mode shifted leftward after 2019, the mode shifted rightward observably. However, this should be further crosschecked with size data collected by observers.

Table 6: Summary of Taiwanese oilfish longline fishery size data by species

Year	OIL _Sample_N	LEC _Sample_N	Total Sample_N	Total Catch_N	Sampling rates
2019	40,874	19,041	59,915	719,151	8.33%
2020	56,113	19,873	75,986	1,227,512	6.19%
2021	16,689	6,615	23,304	490,248	4.75%
2022	25,552	14,754	40,306	733,617	5.49%
2023	66,992	15,775	82,767	1196,042	6.92%

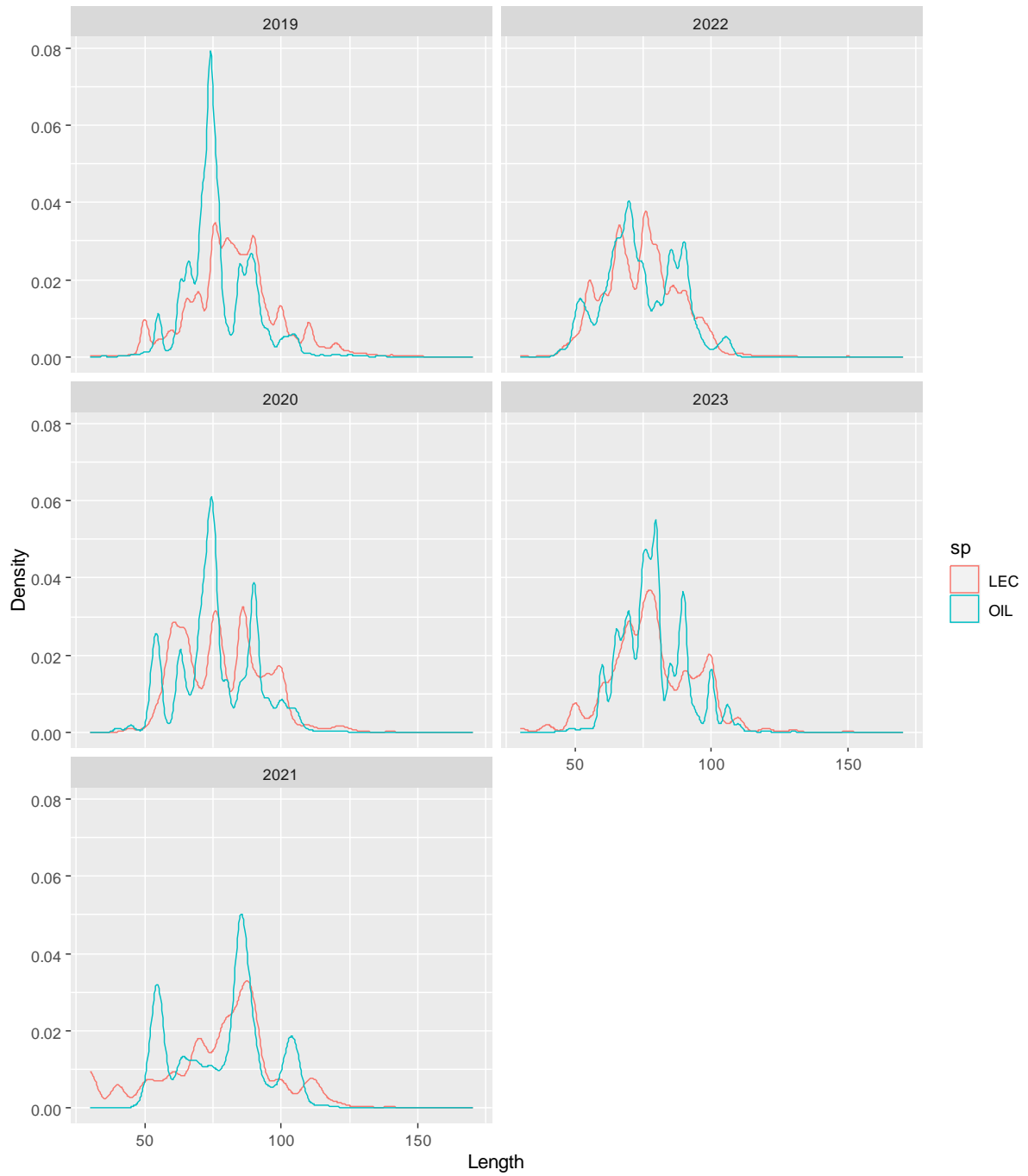


Figure 2. The fork length distributions of oilfish by species from 2019 to 2023

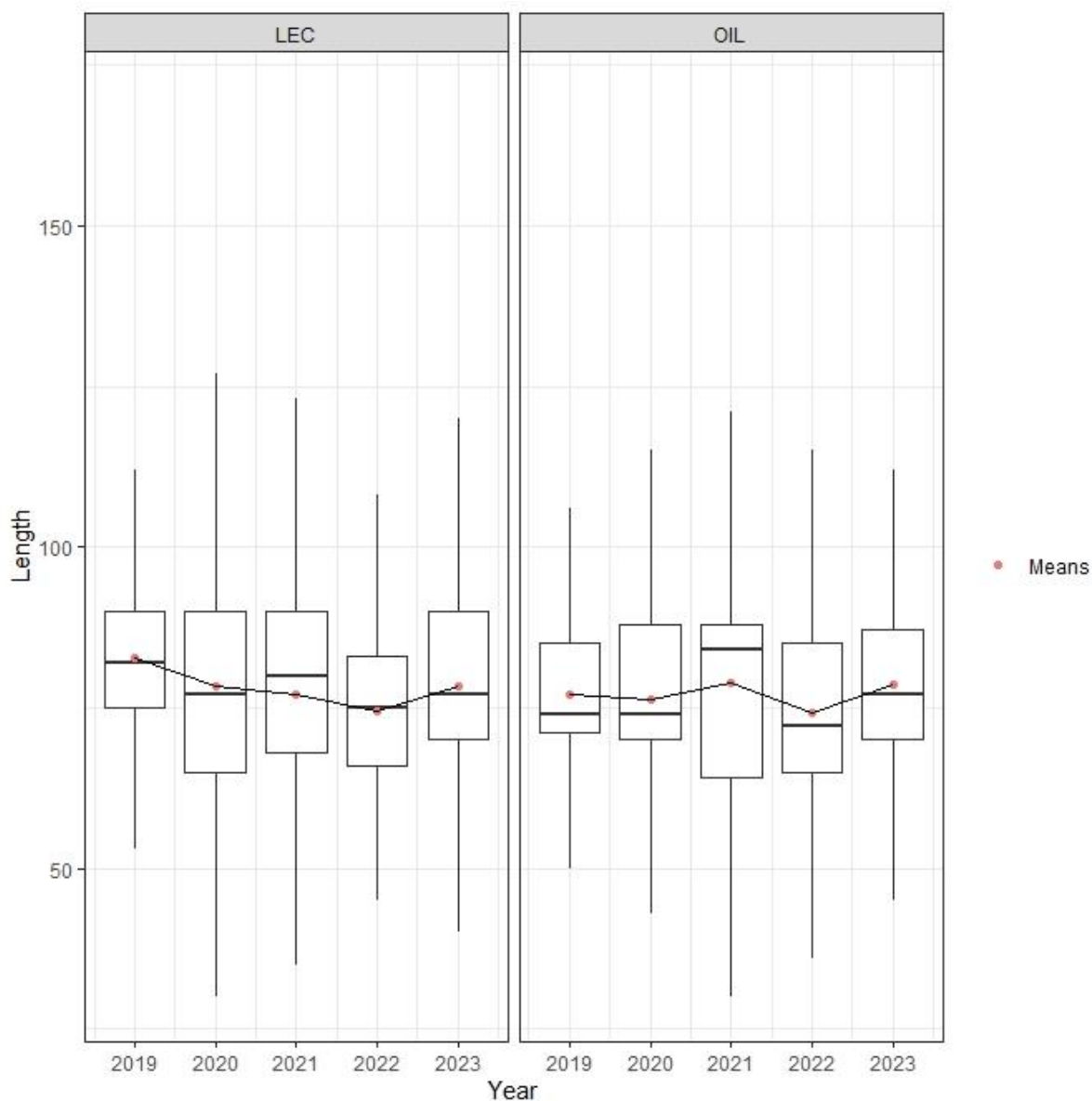


Figure 3. The fork length boxplot with means distributions of oilfish by species from 2019 to 2023

5. Description of data verification mechanisms

All Taiwanese fishing vessels operating in the Indian Ocean are required to install VMS. The data from VMS have also been used to verify the logbook data to improve the data quality.

The competent authority verifies the catches with e-logbook data, Landing/Transshipment Notice and Landing/Transshipment Declaration of individual fishing vessel and conducts port inspection in major ports. By implementing the aforementioned measures, the competent authority can further ensure the catches are legal and traceable.

6. Summary of observer and port sampling program

6.1 Observer program

For purposes of collecting fisheries data and bycatch data, Taiwan launched the pilot observer program in 2001 and deployed observers on vessels fishing in the Indian Ocean commenced in

2002. Our observer program had received interim authorization in 2009 and received full authorization after auditing in November 2011 and October 2017, respectively. The forms used in our observer program are fully conformed to the standards set by WCPFC which include the fishing activities, catch number and weight, species identification, bycatch species and status. In addition, length frequency of major species and the sighting and incidental catch of ecological species were recorded, and biological samplings were collected for biological research. To fulfil the obligation of distant waters fishing state, the observer data has been provided to t-RFMOs, including CCSBT, IATTC, ICCAT and WCPFC, per their requirements, and the trip reports of individual observer of the Indian Ocean has been submitted to IOTC per its resolution on regional observer program. In 2023, there were 3912 fishing days observed by 42 observers dispatched to Taiwanese tuna longline vessels operating in the Indian Ocean. The observer coverage rate of Taiwanese oilfish longline fishery from 2019 to 2023 were summarised in Table 7 which ranges between 5.94% to 11.6% and it should be noted that the observer coverage rate of 2023 is still in preliminary.

Table 7. The observer coverage rate of Taiwanese oilfish longline fishery from 2019 to 2023

Year	2019	2020	2021	2022	2023*
Coverage rate by fishing day	5.94%	11.60%	10.13%	6.42%	4.71%

* in preliminary

The bycatch information compiled from observer data in the SIOFA area from 2019 to 2023 was shown in Table 8. The data of 2023 is still preliminary and there is no marine mammal bycatch observed in the period from 2019 to 2023.

Table 8. The bycatch information compiled from observer data in the SIOFA area from 2019 to 2023

Year	2019	2020	2021	2022	2023*
Sharks	587	63	135	519	235
Seabird	18	3	14	3	25

* in preliminary

6.2 Port sampling program

A port sampling program has conducted in domestic ports to collect the size data of tuna and tuna-like species.