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# National Report of Chinese Taipei to the SIOFA Scientific Committee, 2023

Delegation of Chinese Taipei

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**Abstract**

Oilfish, including Ruvettus pretiosus and Lepidocybium flavobrunneum, was identified as bycatch of large-scale Taiwanese 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 2021, and there were 37 authorized ones fishing for oilfish within SIOFA area in 2022. The averaged catch in recent 5 years (2018 to 2022) was at around 5,070 mt.

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| Recommendations |
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| • That the Scientific Committee considers the National Report provided by Chinese Taipei |

## 1. Description of fishery

Oilfish, including *Ruvettus pretiosus* (OIL) and *Lepidocybium flavobrunneum* (LEC), was bycatch species of large-scale (larger than 100GRT) Taiwanese 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 2021, and there were 37 tuna longliners authorized fishing for oilfish within SIOFA area in 2022.

Oilfish has biological characteristics of daily migrating vertically 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 Taiwanese fishery 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. In 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 2018 to 2022 were listed in Table 1.

Table 1. The number of active oilfish fishing vessels in various scales from 2018 to 2022

| GRT | 2018 | 2019 | 2020 | 2021 | 2022 |
|---|---|---|---|---|---|
| <100 | 0 | 0 | 7 | 8 | 9 |
| 100-200 | 2 | 2 | 2 | 2 | 2 |
| 200-500 | 23 | 28 | 31 | 26 | 24 |
| 500-1000 | 10 | 12 | 11 | 13 | 2 |

## 2. Catch, effort and CPUE

### 2.1 Catch and effort

The summary of effort and catch of Taiwanese oilfish longline fishery from 2018 to 2022 were shown in the Table 2 and Table 3, respectively. It was observed that sub-area 1, 2 and 3b were the core fishing grounds for Taiwanese oilfish longline fishing fleet with higher effort and catch, and the oilfish catch of 2022 was higher than the last year(2021). Also, 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 3a, 6, 7 and 8, the oilfish catches of these sub-areas were lower than others. Because these sub-areas were not the oilfish fishing ground and oilfish was identified as bycatch of Taiwanese longliners operations. For the target species in these regions, sub-area 8 is the fishing ground for tropical tuna and albacore; sub-area 3a is the fishing ground for albacore; sub-area 6, and 7 are the fishing grounds for albacore and southern bluefin tuna.

Table 2. Summary table of Taiwanese oilfish longline fishery effort

| Year | Sub-areas for reporting effort data (unit: hook) | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 1 | 2 | 3a | 3b | 4 | 5 | 6 | 7 | 8 | Total |
| 2018 | 9,016,755 | 1,679,604 | 308,557 | 5,912,673 | 0 | 0 | 964,025 | 0 | 2,891,500 | 20,773,114 |
| 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 | 308688 | 648,954 | 537300 | 1,477,355 | 14,995,193 |

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

| Year | Sub-areas for reporting catch data (unit: mt) | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1 | | 2 | | 3a | | 3b | | 4 | | 5 | | 6 | | 7 | | 8 | | Total |
| | OIL | LEC | OIL | LEC | OIL | LEC | OIL | LEC | OIL | LEC | OIL | LEC | OIL | LEC | OIL | LEC | OIL | LEC | |
| 2018 | 1,935.23 | 1,541.83 | 61.46 | 160.21 | 0.19 | 1.62 | 2,274.55 | 689.10 | 0 | 0 | 0 | 0 | 3.39 | 25.05 | 0 | 0 | 2.93 | 20.55 | 6,716 |
| 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 |

## 2.2 Catch by species

The catch for main target, bycatch, associated and dependent species of Taiwanese oilfish longline fishery from 2018 to 2022 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.

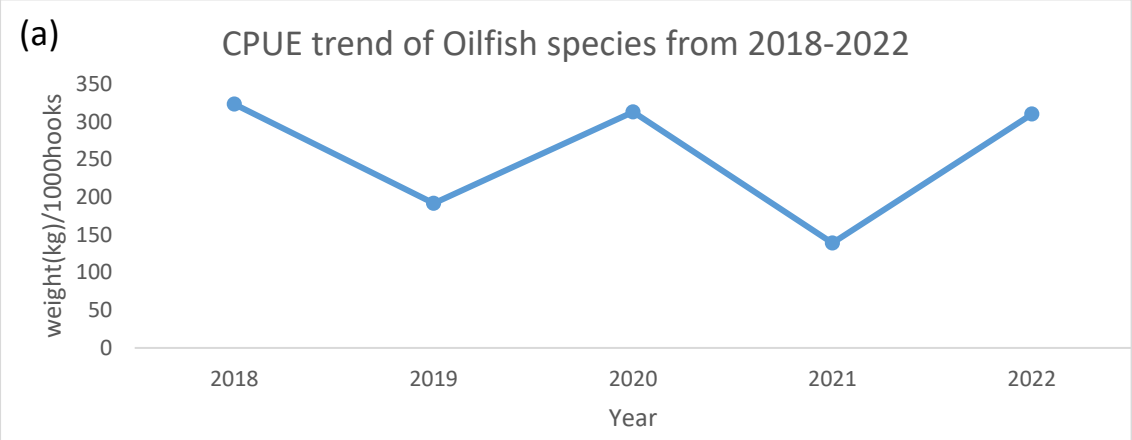
Table4. Catch by species for main target, bycatch, associated and depend species (mt)

| Year | TUN | | BIL | | SKX | | Others | |
|---|---|---|---|---|---|---|---|---|
| | R | D | R | D | R | D | R | D |
| 2018 | 2,178 | 6 | 933 | 0 | 655 | 0 | 189 | 0 |
| 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 |

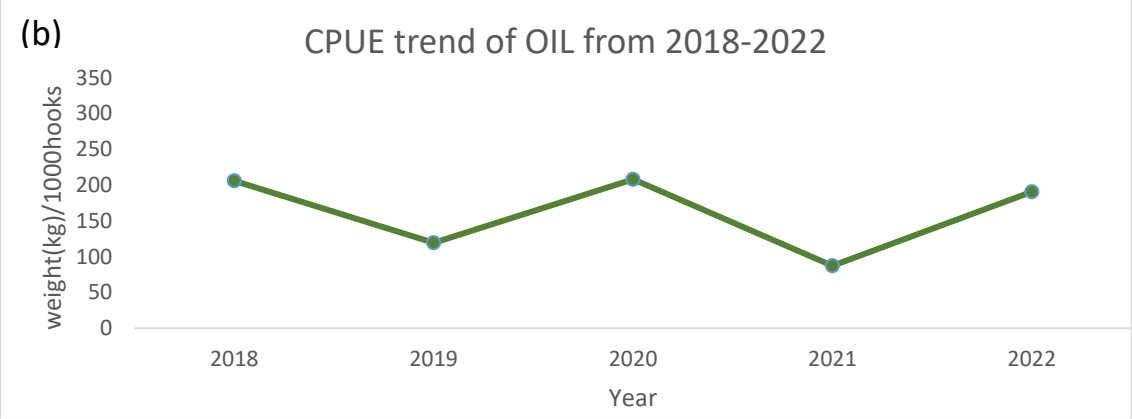
## 2.3 CPUE

The nominal CPUE (kg/1000 hooks) trend by species between 2018 and 2022 was shown in Figure 1, it should be noted that the data of 2022 is still in preliminary status and probably will be revised after data verification. The nominal CPUE trend of pooled oilfish species was shown in Figure 1(a). The CPUE value reached 323 kgs/1000 hooks in 2018 and decreased to 191 kgs/1000 hooks in 2019. After that, it increased to 312 kgs/1000 hook in 2020, then decreased to 139 kgs/1000 hooks in 2021. Finally, the CPUE increased to 310 kgs/1000 hooks in 2022 and with the preliminary data, the fluctuation of the CPUE trend was not changed dramatically in the period of 2018 to 2022. The CPUE trend revealed the lower values in 2019 and 2021, and the higher CPUE values were presented in 2018, 2020 and 2022. Moreover, we also presented the CPUE trend of two oilfish species, it showed the similar pattern with separated data by species in Figure 1(b) and 1(c).

(a)




(b)




(c)

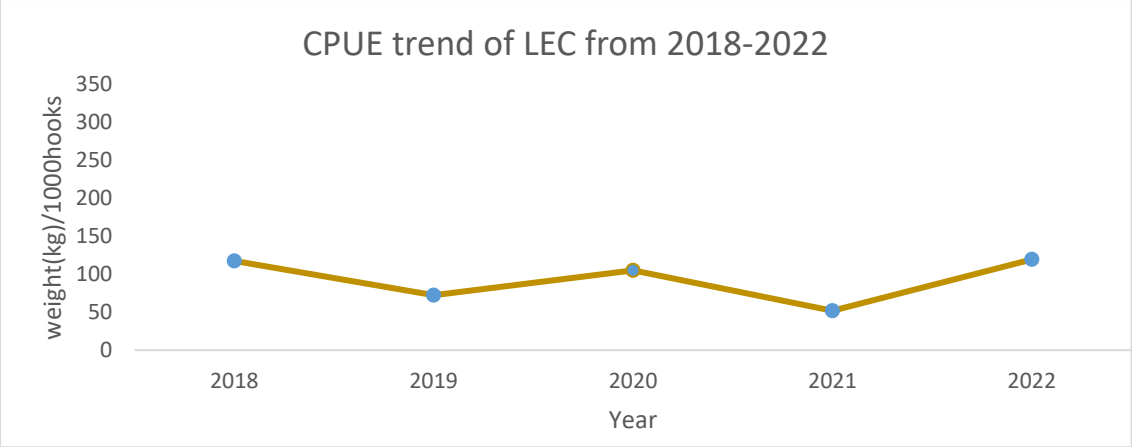



Figure 1. The nominal CPUE trend of oilfish species from 2018 to 2022 with Taiwanese longliner data.

## 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 on the scales and resolutions of the fishery data collection

| | Oilfish longline fishery data collection items on logbook | | | |
|---|---|---|---|---|
| Year | tow / set (*individual or some aggregation*) | time scale (*set-tow hauling time, daily, etc.*) | spatial scale (*tow/set exact position or grid, please provide grid resolution*) | species details (*any aggregation or species grouping*) |
| 2016-2022 | 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 |

The operator or the captain of any fishing vessel intending to land or tranship are mandatory to fill in the Landing/Transhipment Notice and submit it to the competent authority for approval. Moreover, after the completion of landing or transhipment, the operator or the captain are mandatory to submit the Landing/Transhipment 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, oilfsh and escolar.

## 4. Biological sampling and length/age composition of catches

The size data was collected by oilfish longline fishing vessels from 2018 to 2022 annually. The information of Taiwanese oilfish longline fishery size data by species was shown in Table 6 and Figure 2. The range of the sampling rates is between around 4% to 8% in these 5 years. It is observed that most of fork length measurements of size data were distributed between 50 and 100 cm. Multiple peaks of the size data distribution of the two oilfish species were observed during the period of 2018 to 2022. However, this should be further crosschecked with size data collected by observers.

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

| Year | OIL _Sample_N | LEC _Sample_N | Total Sample_N | Total Catch_N | Sampling rates |
|---|---|---|---|---|---|
| 2018 | - | - | 87,933 | 1,046,874 | 8.40% |
| 2019 | 40874 | 19041 | 59,915 | 719,151 | 8.33% |
| 2020 | 56113 | 19873 | 75,986 | 1,227,512 | 6.19% |
| 2021 | 16689 | 6615 | 23,304 | 490,248 | 4.75% |
| 2022 | 25552 | 14754 | 40,306 | 733,617 | 5.49% |

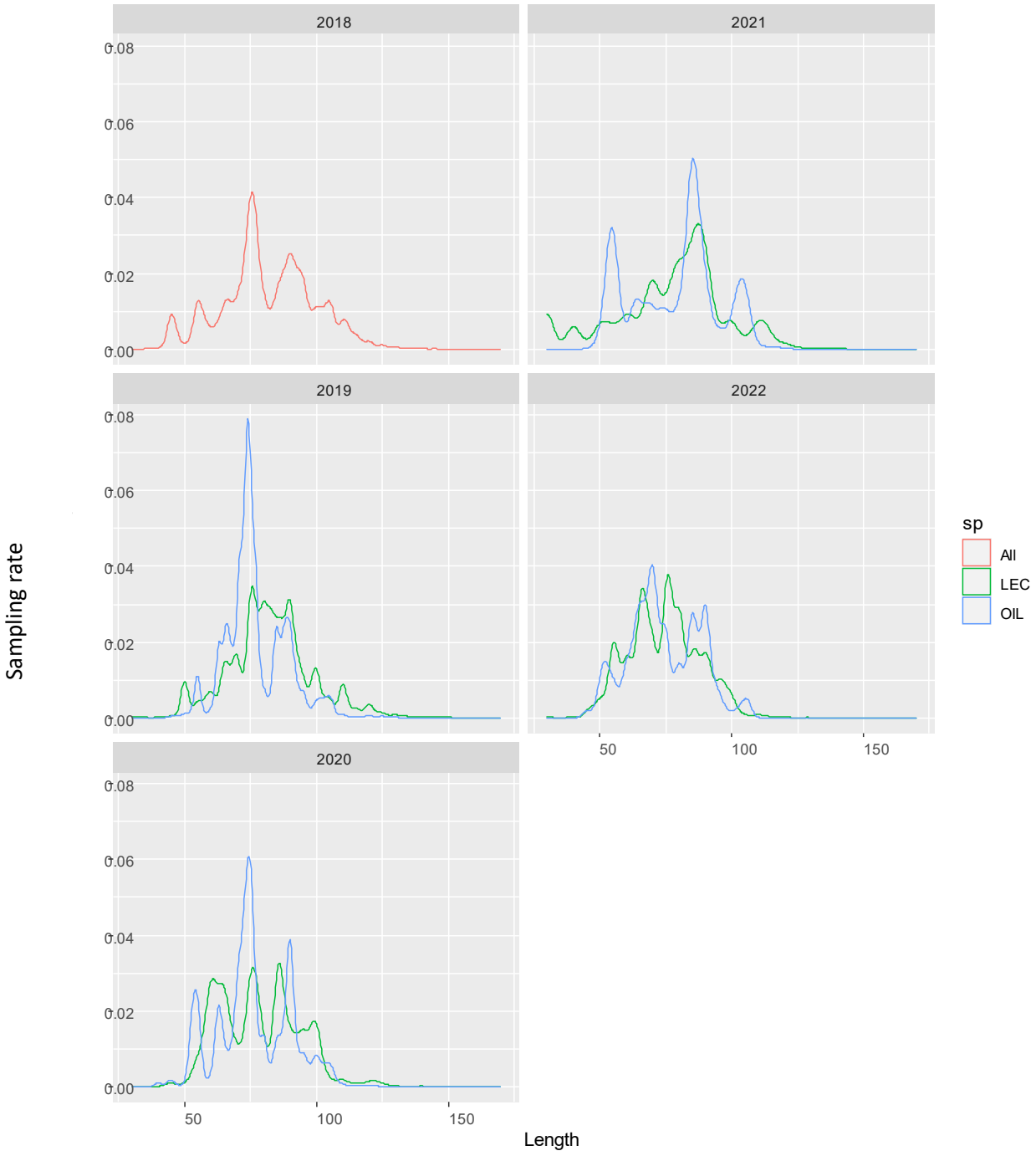



Figure 2. The fork length distributions of oilfish by species from 2018 to 2022

## 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/Transhipment Notice and Landing/Transhipment Declaration of individual fishing vessel so as to 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 fulfill 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 2022, there were 3602 fishing day observed by 41 observers dispatched to Taiwanese tuna longline vessels operating in the Indian Ocean. The observer coverage rate of Taiwanese oilfish longline fishery from 2018 to 2022 were summarised in Table 7 which ranges between 5.94% to 15.49% and it should be noted that the observer coverage rate of 2022 is calculated with preliminary data.

Table 7. The observer coverage rate of Taiwanese oilfish longline fishery from 2018 to 2022

| Year | 2018 | 2019 | 2020 | 2021 | 2022* |
|---|---|---|---|---|---|
| Coverage rate by fishing day | 15.49% | 5.94% | 11.60% | 10.13% | 12.13% |

* in preliminary

The bycatch information compiled from observer data in the SIOFA area from 2018 to 2022 was shown in Table 8. The data of 2022 is still preliminary and there is no marine mammal bycatch observed in the period from 2018 to 2022.

Table 8. The bycatch information compiled from observer data in the SIOFA area from 2018 to 2022

| Year | 2018 | 2019 | 2020 | 2021 | 2022* |
|---|---|---|---|---|---|
| Sharks | 915 | 587 | 63 | 135 | 506 |
| Seabird | 25 | 18 | 3 | 14 | 2 |

* 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.