# ‘Crew-based’ (Local) Observer Programme in Sri Lankan longline vessels as an alternative on board data collection method

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*Implemented through*

**Department of Fisheries & Aquatic Resources Development**

District Fisheries Offices in Chilaw and Negombo

researched & written by

**pelagikos pvt ltd**

Crew based observer program under SEASL funds collected data from eight (08) vessels during the period of December 2025 to May 2026. Three sets per fishing trip was the targeted observed set number for data collection. (Table 1).

**Table 1 - Details of the vessels deployed between December – May 2026**

| Skipper name | Departure Date | Arrival Date | Total trip | Total no of sets | Ob |
|---|---|---|---|---|---|
| L.Thusara | 2025.11.12 | 2026.01.03 | 52 | 11 | 3 |
| | 2026.01.23 | 2026.03.22 | 58 | 11 | 3 |
| W.N.C.Fernando | 2025.10.10 | 2025.12.08 | 59 | 14 | 4 |
| | 2026.01.13 | 2026.03.15 | 63 | 7 | 5 |
| WNST Fernando | 2025.10.17 | 2025.12.17 | 61 | 14 | 3 |
| W.A.S.T. Pushpakumara | 2026.02.05 | 2026.04.15 | 68 | 12 | 3 |
| H.W.N.M.Kumara | 2025.10.28 | 2026.01.12 | 76 | 9 | 2 |
| N.C.Fernando | 2025.12.17 | 2026.02.17 | 48 | 12 | 4 |
| | | | 485 | 90 | 27 |

The total number of sets observed was 27 and the target was 24 (three sets per fishing trip). Eight (08) vessels spent a total of 485 days in the sea and set the longline for 90 times (Table 1). According to collected data, 30% of the total operation sets were observed for data collection using the crew-based observer protocol. Digital data collected by each observer was processed by `pelagikos`. Spatial and temporal data were extracted from each image together with details of the species and the weight and length of each fish or other captured species. Data such as, outcome (fate) for each fish or other captured species (*i.e.* whether the species is retained or discarded dead or alive), number and species caught, weather they were de-hooked or not were gathered from crew-based observer. During the process of wrapping up the data collection all the crew-based observers were asked if they have any further remarks and feedbacks were recorded.

### 3.1 Trip, Gear and Setting position data

Trip data (observer information, vessel information, trip information, vessel attributes), gear data (gear specification, line configuration) set data (setting operation, bait details, hook details, mitigation measures, hauling operation) and catch data (catch details, depredation, non-target species) were successfully recorded using the crew-based observer program according to the IOTC data forms. (Table 2). The main fishing gear type used in the multi-day vessels in Negombo and Chilaw is longline. The average number of hooks per set was 1,947. The total effort over the 27 sets observed was 58,386 hooks (Table 2).

**Table 2 – IOTC data point compliance of Local observer, vessel, trip, gear, set and catch data**

| Skipper name | Deployment | Trip data | | | Gear data | | | Set data | | | Effort | | Set | | catch data | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | T | A | % | T | A | % | T | A | % | Hooks | Effort | Total | Ob. | T[1] | A[2] |
| L.Thusara | D4 | 63 | 63 | 100% | 12 | 12 | 100% | 41 | 41 | 100% | 2,000 | 6,000 | 11 | 3 | 42 | 47 |
| | D5 | 63 | 63 | 100% | 12 | 12 | 100% | 41 | 41 | 100% | 1,500 | 6,000 | 11 | 3 | 28 | 63 |
| W.N.C.Fernando | D4 | 63 | 63 | 100% | 12 | 12 | 100% | 41 | 41 | 100% | 1,890 | 7,560 | 14 | 4 | 29 | 77 |
| | D5 | 63 | 63 | 100% | 12 | 12 | 100% | 41 | 41 | 100% | 2,000 | 10,000 | 7 | 5 | 33 | 75 |
| WNST Fernando | D4 | 63 | 63 | 100% | 12 | 12 | 100% | 41 | 41 | 100% | 2,142 | 6,426 | 14 | 3 | | 35 |
| W.A.S.T. Pushpakumara | D3 | 63 | 63 | 100% | 12 | 12 | 100% | 41 | 41 | 100% | 1,800 | 5,400 | 12 | 3 | 65 | 38 |
| H.W.N.M.Kumara | D3 | 63 | 63 | 100% | 12 | 12 | 100% | 41 | 41 | 100% | 2,500 | 10,000 | 9 | 2 | 29 | 34 |
| N.C.Fernando | D1 | 63 | 63 | 100% | 12 | 12 | 100% | 41 | 41 | 100% | 1,750 | 7,000 | 12 | 4 | 60 | 67 |
| | | | | | | | | | | | **15,582** | **58,386** | **90** | **27** | **286** | **436** |

### 3.2 Catch and Scientific Data

The catch data comprised of a total of 436 fish and other capture species. Pelagikos was able to extract the local name, English name, Scientific name, IOTC code and outcome (fate) for 100% of the observed catch. Weight was recorded for 100% and length for 98% of the observed catch. Date and time data were extracted for 100% of the digital data (images and the videos). Location (latitude and longitude) data was successfully extracted from 53% of the observed catch. Overall, scientific data were recorded from 95% of the observed catch (Target(T) = 3,924), during the latest deployment of crew-based observers (Table 3).

**Table 3 – Summary of observed scientific data for catch**

| Scientific data | T | A | % |
|---|---|---|---|
| Local Name | 436 | 436 | 100% |
| English name | 436 | 436 | 100% |
| Scientific name | 436 | 436 | 100% |
| IOTC code | 436 | 436 | 100% |
| Fate | 436 | 436 | 100% |
| Weight (kg) | 436 | 436 | 100% |
| length (cm) | 436 | 428 | 98% |
| Date/ Time | 436 | 436 | 100% |
| Location (Lat./ long. | 436 | 233 | 53% |
| | **3,924** | **3,713** | **95%** |

### 3.3 Catch and Catch per Unit Effort (CPUE per 1,000 hooks)

A count of 21 species were observed in the catch recorded by the crew-based observers. According to the collected data, 62.4% (by number) of the fish caught were yellowfin tuna, swordfish (6.2%) and bigeye tuna (0.9%) as target species. Results recorded, 18 other capture species (Table 4). Skipjack tuna (7.8%), were the main other capture species recorded.

From the target species, a total of 272 yellowfin tuna were recorded and the catch per unit effort (per 1,000 hooks) for yellowfin tuna was 4.66 by number of fish whereas the catch per unit effort (per 1,000 hooks) was 159.71kg by weight

Crew-based observers recorded that the replacement of frozen/raw baits (squids, milk fish, flying fish) with artificial baits (squid lure) as a factor that reduces shark bycatch including protected shark species. Almost all the crew-based observers reported the tuna harvest largely being eaten by some protected marine mammal species and request for any possible approaches to minimize this harvest lost.

**Table 4 – Catch and catch per unit effort (by number (n) and by weight (kg) per 1,000 hooks)**

| Species Name | n | % | CPUE | Weight(kg) | % | CPUE |
|---|---|---|---|---|---|---|
| **Target Species** | **303** | **69.5%** | **5.19** | **10013** | **84.7%** | **171.50** |
| Yellowfin Tuna | 272 | 62.4% | 4.66 | 9325 | 78.9% | 159.71 |
| Swordfish | 27 | 6.2% | 0.46 | 552 | 4.7% | 9.45 |
| Bigeye tuna | 4 | 0.9% | 0.07 | 136 | 1.2% | 2.33 |
| **Other Capture Species** | **133** | **30.5%** | **2.28** | **1,810.5** | **15.3%** | **31.01** |
| Skipjack tuna | 34 | 7.8% | 0.58 | 96 | 0.8% | 1.64 |
| Lancet Fish | 23 | 5.3% | 0.39 | 84 | 0.7% | 1.44 |
| Silky Shark | 13 | 3.0% | 0.22 | 206 | 1.7% | 3.53 |
| Indo-Pacific sailfish | 12 | 2.8% | 0.21 | 220 | 1.9% | 3.77 |
| Escolar | 11 | 2.5% | 0.19 | 40 | 0.3% | 0.69 |
| Common Dolphinfish | 10 | 2.3% | 0.17 | 27.5 | 0.2% | 0.47 |
| Blue shark | 7 | 1.6% | 0.12 | 225 | 1.9% | 3.85 |
| Black Marlin | 4 | 0.9% | 0.07 | 137 | 1.2% | 2.35 |
| Spinetail devil ray | 4 | 0.9% | 0.07 | 390 | 3.3% | 6.68 |
| Albacore | 3 | 0.7% | 0.05 | 85 | 0.7% | 1.46 |
| Mackerel shark | 3 | 0.7% | 0.05 | 170 | 1.4% | 2.91 |
| Blue Marlin | 2 | 0.5% | 0.03 | 70 | 0.6% | 1.20 |
| Shortbill spearfish | 2 | 0.5% | 0.03 | 40 | 0.3% | 0.69 |
| Atlantic pomfret | 1 | 0.2% | 0.02 | 2 | 0.0% | 0.03 |
| Crocodile shark | 1 | 0.2% | 0.02 | 1 | 0.0% | 0.02 |
| Neon flying squid | 1 | 0.2% | 0.02 | 1 | 0.0% | 0.02 |
| Pelagic stingray | 1 | 0.2% | 0.02 | 1 | 0.0% | 0.02 |
| Striped marlin | 1 | 0.2% | 0.02 | 15 | 0.1% | 0.26 |
| | **436** | **100.0%** | **7.47** | **11,823.5** | 100.0% | 202.51 |

### 3.4 Outcome

From the total observed catch 92.0% of catch was retained (401 out of 436 individuals), 6.0% (26 individual) was discarded dead, 0.5 % (2 individuals) was discarded alive and 1.6% (7 individuals) was depredated (Table 5). Most of the other capture species were retained. Lancet fish, Escolar, Pelagic stingray and crocodile shark were among the main discarded other capture species. None of the protected species were caught.

**Table 5 – Outcome (fate) of captured species (retained, discarded alive or discarded dead)**

| Species Name | Total | R | % | DD | % | DL | % | DP | % |
|---|---|---|---|---|---|---|---|---|---|
| **Target Species** | **303** | **295** | **97.4%** | **1** | **0.3%** | **0** | | **7** | **2.3%** |
| Yellowfin Tuna | 272 | 264 | 97.1% | 1 | | | | 7 | 3% |
| Swordfish | 27 | 27 | 100.0% | | | | | | |
| Bigeye tuna | 4 | 4 | 100.0% | | | | | | |
| **Other Capture Species** | **133** | **106** | **79.7%** | **25** | **18.8%** | **2** | **1.5%** | | |
| Skipjack tuna | 34 | 34 | 100.0% | | | | | | |
| Lancet Fish | 23 | 2 | 8.7% | 21 | 91% | | | | |
| Silky Shark | 13 | 13 | 100.0% | | | | | | |
| Escolar | 11 | 7 | 63.6% | 4 | 36% | | | | |
| Blue shark | 7 | 7 | 100.0% | | | | | | |
| Indo-Pacific sailfish | 12 | 12 | 100.0% | | | | | | |
| Common Dolphinfish | 10 | 10 | 100.0% | | | | | | |
| Albacore | 3 | 3 | 100.0% | | | | | | |
| Black Marlin | 4 | 4 | 100.0% | | | | | | |
| Mackerel shark | 3 | 3 | 100.0% | | | | | | |
| Blue Marlin | 2 | 2 | 100.0% | | | | | | |
| Shortbill spearfish | 2 | 2 | 100.0% | | | | | | |
| Spinetail devil ray | 4 | 4 | 100.0% | | | | | | |
| Atlantic pomfret | 1 | 1 | 100.0% | | | | | | |
| Crocodile shark | 1 | | | | | 1 | 100% | | |
| Neon flying squid | 1 | 1 | 100.0% | | | | | | |
| Pelagic stingray | 1 | | | | | 1 | 100% | | |
| Striped marlin | 1 | 1 | 100.0% | | | | | | |
| | **436** | **401** | **92.0%** | **26** | **6.0%** | **2** | **0.5%** | **7** | **1.6%** |

### 3.5 Target Species Analysis

Length data (LJFL) were extracted from images of yellowfin tuna by `pelagikos` for 270 individual fish. Length frequency for yellowfin tuna observed during the current phase of the crew-based observer program is shown in Figures 5. The minimum length (FL) observed were 30 cm and maximum length was 181 cm. The average size of yellowfin tuna caught was 120cm.

According to data available on Fishbase[1] the maximum observed FL for yellowfin tuna is 239 cm (male/unsexed); the common length is 150 cm. The average FL on 50% maturity ($L_{m50}$) for yellowfin tuna is 103.3 cm with a range of 78 – 158 cm (*ibid*).

According to the data analysis, 84% of yellowfin tuna caught by Sri Lanka's short longline yellowfin tuna vessels during the current phase were above the $L_{m50}$ (from number of fish with FL >104cm). Length optimum of the data collected is between 112cm – 137cm and 60% of fish are in the length optimum range.

[1] www.fishbase.de

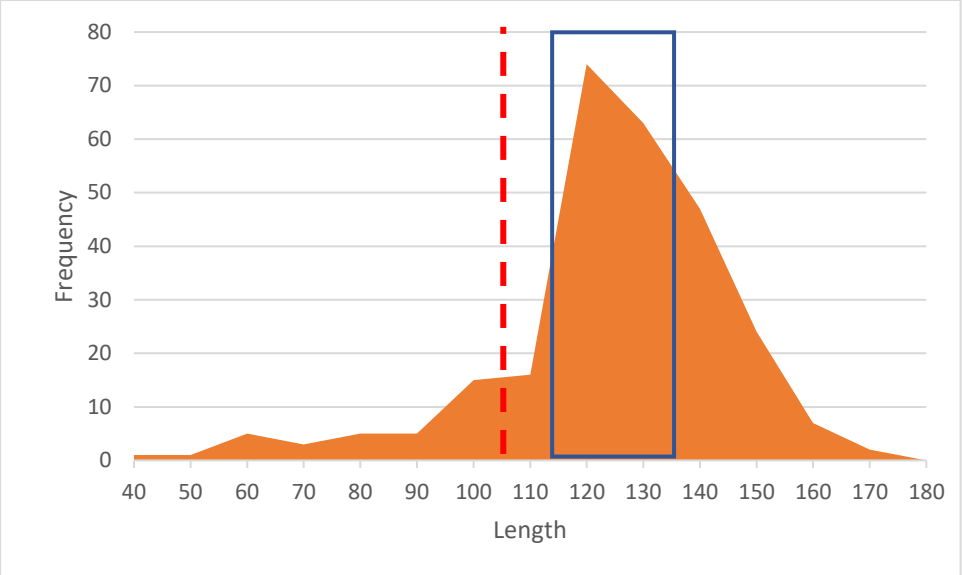


**Figure 5 - Length frequency for YFT under the crew-based observer program**

*Thunnus albacares* Maturity: $L_m$ 103.3, range 78 - 158 cm. Max length: 239 cm FL male/unsexed; common length: 150 cm FL male/unsexed

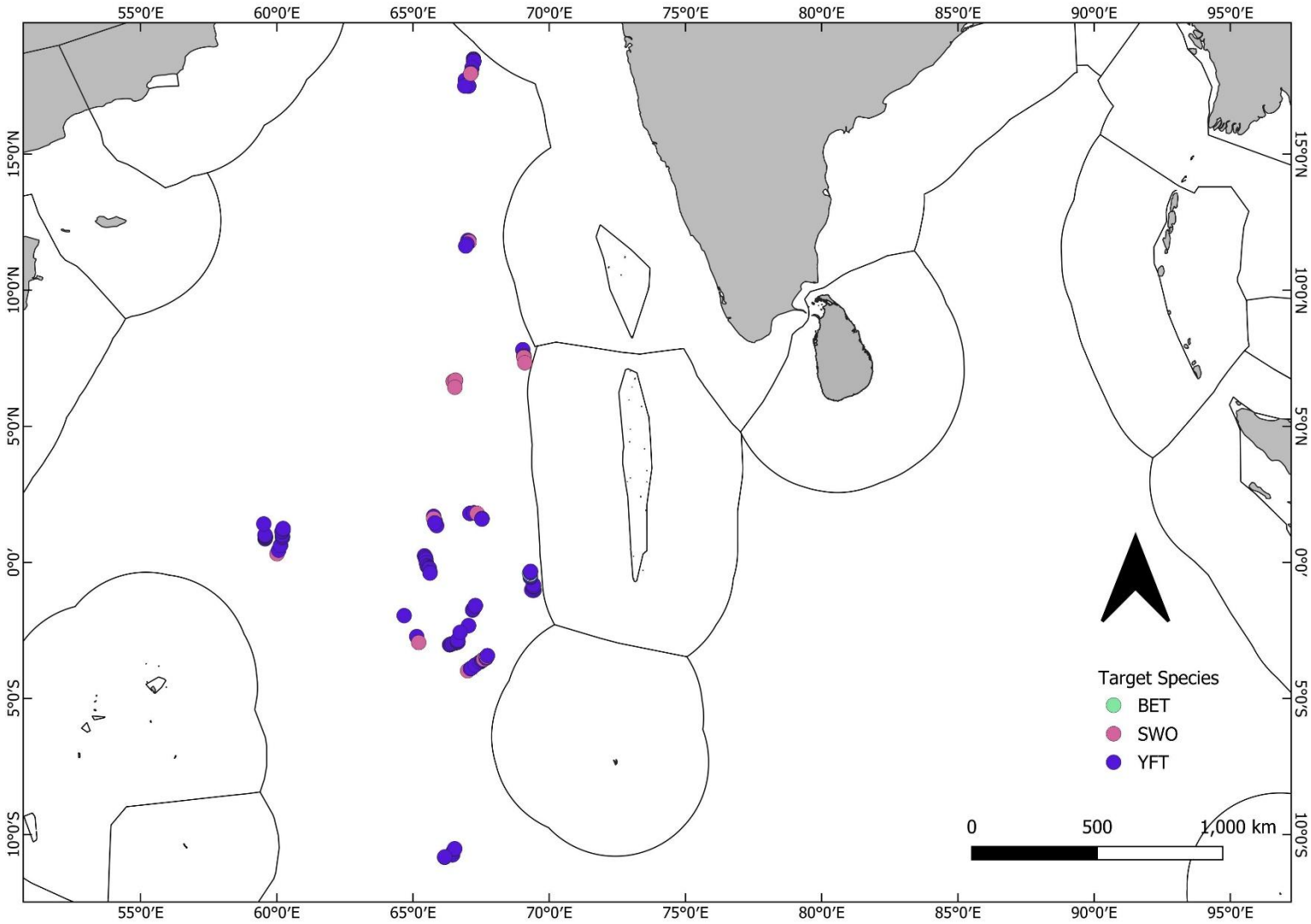


**Figure 1: Locations of the target species caught by longline vessels**

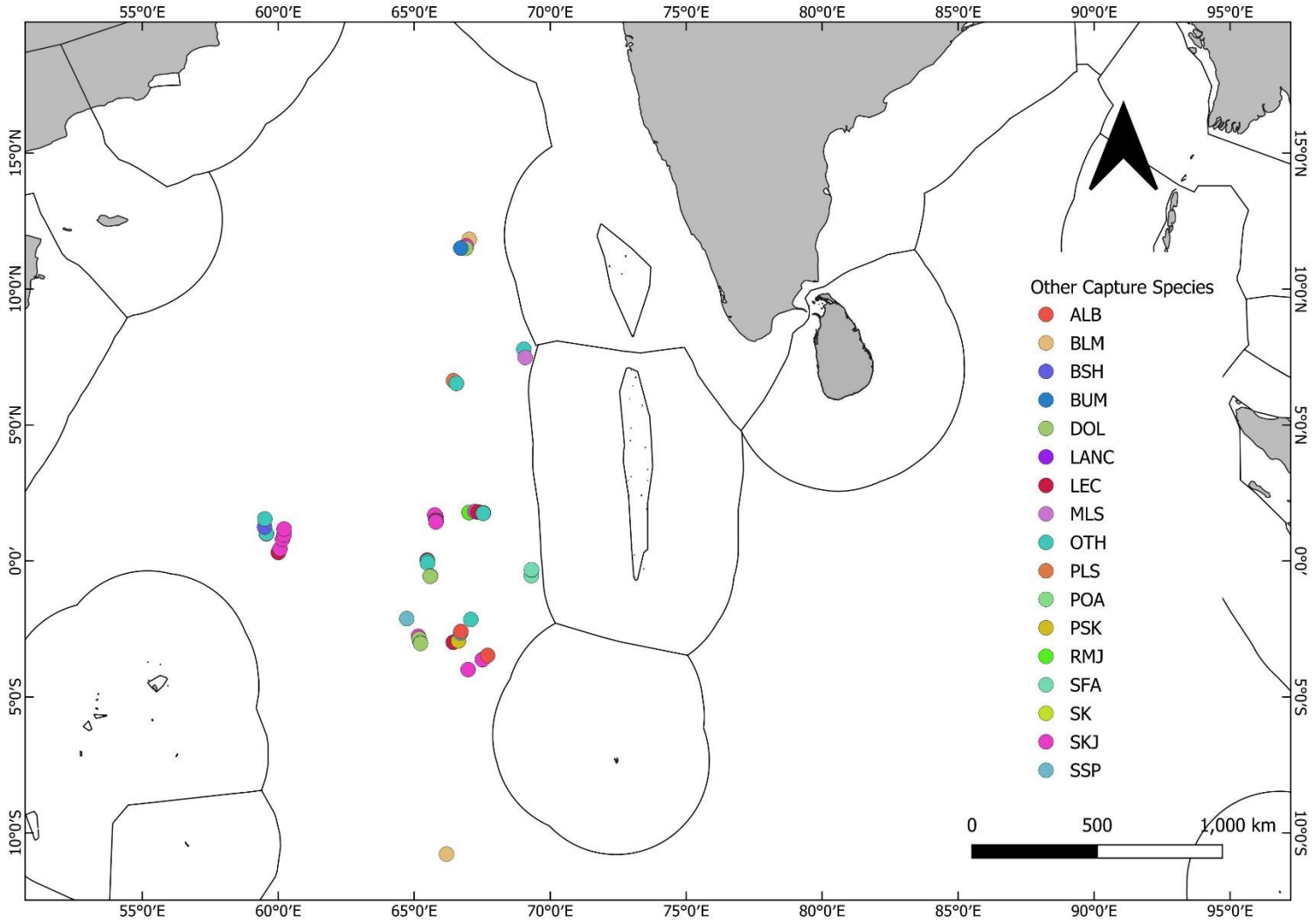


**Figure 2: Locations of the other capture species caught by longline vessels**

### 3.6 Safe handle and live release of protected species

During the study period there were no any images or videos of protected species were recorded. Other than crew-based observer program operation division of the DFAR continuing distributing de hookers and line cutters through the revolving fund of DFAR