



**Implementation of the Local (crew-based) Observer Programme on less 24-meter vessels, with 17 boat owners / skippers under Chilaw / Negombo / Matara/Galle District Fisheries Extension Offices**

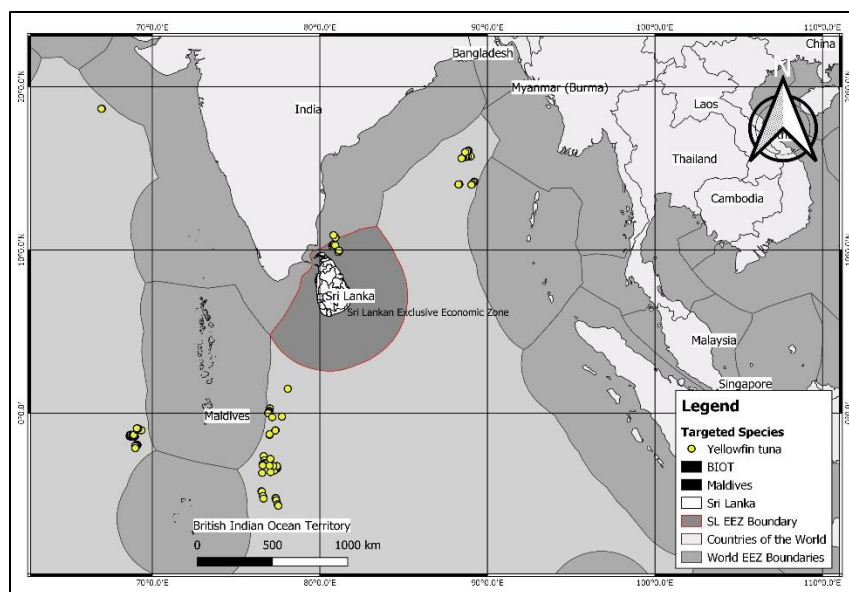


*A sub project of the Sri Lanka longline fishery improvement project*

# **Progress Report**

## **Seafood Exporters' Association of Sri Lanka**

Updated on 11<sup>th</sup> February 2021



*Implemented through*

**Department of Fisheries & Aquatic Resources Development**

Information Technology Unit – Colombo

District Fisheries Offices in Chilaw / Negombo / Matara / Galle

*Financed by*

**Seafood Exporters' Association of Sri Lanka**

Designed and Researched by

**pelagikos pvt ltd**







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## Executive Summary

The Indian Ocean Tuna Commission (IOTC) adopted a Resolution (11/04) on a Regional Observer Scheme in 2011. Resolution 11/04 sets out the minimum recording requirements for fisheries for tuna and tuna-like species in the IOTC area. The Government of Sri Lanka (GOSL) initiated an Observer Scheme in compliance with Resolution 11/04 in 2013. However, the small size of Sri Lankan vessels was highlighted by Observers as a constraint that precludes the safe deployment of Observers on the majority of Sri Lankan vessels registered to fish in the IOTC's area of competence. In 2020 98.7% of the 1,838 Sri Lankan vessels registered to fish in the IOTC's area of competence were less than 24 m. Sri Lanka's large fleet of small-scale vessels represents 34% of total number of vessels registered to fish in the IOTC's area of competence (5,430<sup>1</sup>). The average length of Sri Lankan vessels registered with the IOTC is 12.6 m (41.34 ft.). The majority of Sri Lankan longline vessels are simply too small and inadequately equipped to deploy independent observers. An alternative approach is necessary to enable Sri Lanka to *collect verified catch data and other scientific data related to the fisheries for tuna and tuna-like species in the IOTC area of competence* in compliance with Resolution 11/04.

In 2018 a sub-project was initiated by the new Sri Lanka longline FIP to investigate whether skippers and crew operating less than 24 m longline fishing vessels could be trained as Local Observers (LO) to collect independently verifiable fisheries information and data in accordance with IOTC's Resolution 11/04. The success of the sub project suggested that skippers and crew operating less than 24 meter longline fishing vessels could be trained as LO to collect fisheries information and data. This report describes the results of the fourth phase of the implementation of the LOP by the Sri Lanka longline FIP in collaboration with boat owners and skippers working on 17 vessels, the DFAR's Information Communication and Technology Division in Colombo, District Fisheries Offices in Negombo, Chilaw, Matara and Galle corporate members of the SEASL. The current phase of the local observer programme was co-financed by corporate members of the SEASL. Technical assistance was provided by pelagikos pvt ltd.

Seventeen (17) skippers operating less than 24 m longline fishing vessels under Negombo, Chilaw, Matara and Galle were trained by pelagikos to collect fisheries information and data using the LOP between August 2020 and January 2021. All boats collected data from two trips. Fifteen (15) of the 17 LO returned with digital data. One boat collected data from three trips, three boats were collected data from one trip and two boats were returned with poor data which was discarded. The LOP used during the current phase of the local observer programme enabled the collection of more fisheries information and data (66 variables) compared to the Third phase (40 variables). The overall recovery of fisheries information and data targeted under the current phase was 98%. The LOP used during the current phase enabled LO to collect trip (94%), gear (94%), set (99%), catch (117%) and scientific (98%) information and data from 75 sets from 15 vessels over a period of five months. The cost of collecting fisheries information and data was US\$ 195 per set / US\$ 586 per trip. The results of the four phases of the local observer programme further demonstrate the effectiveness of the LOP to collect independently *verifiable catch and other scientific data related to fisheries* from Sri Lanka's large fleet of small-scale longline fishing vessels, which fish outside Sri Lanka's EEZ. Furthermore, the cumulative observations generated by the LOP over the four phases for endangered, threatened and protected (ETP) species suggest that Sri Lanka's longline fisheries for yellow-fin and bigeye tuna and swordfish have a reasonable chance to moving from 'fail' to 'conditional pass' against the MSC Fishery Standard in 2022, if information and data about ETP species continues to be collected using the LOP.

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<sup>1</sup> <https://iotc.org/vessels/current>



## Introduction

### **IOTC Resolution 11/04 - On a Regional Observer Scheme**

The Indian Ocean Tuna Commission (IOTC) adopted a Resolution (11/04) on a Regional Observer Scheme in 2011. Resolution 11/04 sets out the minimum recording requirements for fisheries for tuna and tuna-like species in the IOTC area, as well as timelines for implementation and reporting by Contracting Party Countries (CPC) and Cooperating Non-Contracting Party Countries to the IOTC, which includes Sri Lanka. The implementation of the Regional Observer Scheme by IOTC CPCs officially commenced on 1st July 2010; it is based entirely on national implementation. IOTC Resolution 11/04 notes *that the objective of the IOTC observer scheme is to collect verified catch data and other scientific data related to the fisheries for tuna and tuna-like species in the IOTC area of competence. In order to improve the collection of scientific data, at least 5 % of the number of operations/sets for each gear type by the fleet of each CPC while fishing in the IOTC area of competence of 24 meters overall length and over, and under 24 meters if they fish outside their Exclusive Economic Zone (EEZ) shall be covered by this observer scheme. For vessels less than 24 meters if they fish outside their EEZ, the above mentioned coverage should be achieved progressively by January 2013.*

The Government of Sri Lanka (GOSL) initiated an observer scheme in compliance with Resolution 11/04 in 2013. The observer scheme was implemented by the Department of Fisheries and Aquatic Resources (DFAR). Six officers were trained and deployed by DFAR to collect fisheries information and data in 2014, with financial assistance from the Sri Lanka tuna fishery improvement project (FIP)<sup>2</sup>. However, the small size of Sri Lankan longline vessels was quickly highlighted by the observers as a constraint that precludes the safe deployment of independent observers on the majority of Sri Lankan vessels registered to fish in the IOTC's area of competence. In 2020 98.7% of the 1,838 Sri Lankan vessels registered to fish in the IOTC's area of competence were less than 24 m. Sri Lanka's large fleet of small-scale vessels represents 34% of total number of vessels registered to fish in the IOTC's area of competence (5,430<sup>3</sup>). The average length overall (LOA) of Sri Lanka's less than 24 m vessels was 12.6 m (41.34 ft.) in 2020. The majority of Sri Lankan longline vessels are simply too small and inadequately equipped (*i.e.* no sleeping quarters, basic sanitation and bathing facilities and meals) to deploy independent observers. An alternative approach was necessary to enable Sri Lanka to *collect verified catch data and other scientific data related to the fisheries for tuna and tuna-like species in the IOTC area of competence* in compliance with Resolution 11/04.

### **Local Observer Programme for < 24 m vessels**

In 2018 a sub-project was initiated by the new Sri Lanka longline FIP to investigate whether skippers and crew operating less than 24 m longline fishing vessels could be trained to collect independently verifiable fisheries information and data in accordance with IOTC's Resolution 11/04. Twenty skippers and crew were trained and deployed as Local Observers (LO) during the first phase (September 2018 – March 2019). Eleven LO and crew took part in the second phase (April to June 2019). The sub project was implemented through the DFAR's Information and Communication Technology (ICT) Division in Colombo and the District Fisheries Offices (DFO) in Negombo and Chilaw in collaboration with the multi-day boat owners' associations in Negombo and Chilaw. The sub project was co-financed by SEA PACT ([www.seapact.org](http://www.seapact.org)) and the Seafood Exporters' Association of Sri Lanka ([www.seasl.lk](http://www.seasl.lk)).

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<sup>2</sup> <https://www.sustainablefish.org/News/New-Sri-Lanka-Tuna-FIP>

<sup>3</sup> <https://iotc.org/vessels/current>



The success of the pilot phase and the improvements made to the Local Observer Protocol (LOP) during the second phase strongly suggested that skippers and crew operating less than 24 meter longline fishing vessels could be trained as LO to collect independently verifiable trip, gear, set, catch and scientific data in accordance with IOTC's Resolution 11/04.

### Endangered, threatened and protected (ETP) species

A pre-assessment (PA) of Sri Lanka's longline fisheries for yellowfin and bigeye tuna and swordfish was conducted by Marine Stewardship Council (MSC) approved consultants against the MSC's Fisheries Standard in 2018. The PA report (2018) suggested that the fisheries would fail the MSC Principal Indicators scoring for endangered, threatened and protected (ETP) species information (2.3.3) and outcome (2.3.1) under a full assessment. This finding caused the three fisheries to fail the MSC PA overall. MSC defines endangered, threatened and protected species as

- ✓ Species that are recognised by ***national legislation*** (see Annex II)
- ✓ Species listed in the binding ***international agreements*** given below:
  - a. **Appendix 1** of the *Convention on International Trade in Endangered Species* (CITES), unless it can be shown that the particular stock of the CITES listed species impacted by the UoA under assessment is not endangered.
  - b. **Binding agreements** concluded under the *Convention on Migratory Species* (CMS), including:
    - i. Annex 1 of the *Agreement on Conservation of Albatross and Petrels* (ACAP);
    - ii. Table 1 Column A of the *African-Eurasian Migratory Waterbird Agreement* (AEWA);
    - iii. Agreement on the *Conservation of Small Cetaceans of the Baltic and North Seas* (ASCOBANS);
    - iv. Annex 1, Agreement on the *Conservation of Cetaceans of the Black Sea, Mediterranean Sea and Contiguous Atlantic Area* (ACCOBAMS);
    - v. Wadden Sea Seals Agreement;
    - vi. Any other binding agreements that list relevant ETP species concluded under this Convention

The DFAR collects catch data through the Daily Catch Record Book from all multi-day fishing vessels operating within and beyond Sri Lanka's EEZ. Catch data recorded in the logbooks by skippers is focused primarily on the commercially valuable / export species caught (*i.e.* yellowfin and bigeye tuna, swordfish, sailfish and marlin). Information on ETP species is also recorded in the Daily Catch Record Book, however not all skippers record each and every ETP species caught and or the outcome for each individual (*i.e.* discarded alive or dead). The LOP requires Local Observers to record each and every ETP species caught and the outcome for each individual (*i.e.* discarded alive or dead) for a given set. The information and data collected by Local Observers using the LOP is slowly improving the fisheries' score against MSC PI 2.3.3 (Information) and 2.3.1 (Outcome). Once enough independently verifiable information and data about the catch of ETP is collected by LO using the LOP, then there is a good possibility that each fishery's score against MSC's Principle 2 will improve to point where the and the fisheries' MSC score overall will score a Conditional Pass of the MSC Fisheries Standard in 2021.

This Narrative Report describes the results of the fourth phase of the implementation of the LOP by the Sri Lanka longline FIP in collaboration with boat owners and skippers working on 17 vessels, the DFAR's ICT Division in Colombo, DFO in Negombo, Chilaw and Matara corporate members of the SEASL. The current phase of the local observer programme was co-financed by the corporate members of the SEASL. Technical assistance was provided by pelagikos pvt ltd.



## Methodology

Sixteen (17) Local Observers (LO) operating less than 24 m longline fishing vessels were trained by pelagikos to collect trip, gear, set, catch and scientific data using the LOP between August 2020 to January 2021 (Table 1). The training programs and the data collection were conducted with the outbreak of the global COVID19 pandemic in Sri Lanka.

During the pre-departure training the aim of the local observer programme and the IOTC's Resolution 11/04 on a regional observer scheme was explained. Each LO was provided with fully charged Nikon Coolpix cameras and flip-board to collect digital catch and scientific data (see images right and below). Instruction book on data collection protocol were given to local observer to make data collection method more clear. Each LO was trained to record set, catch and scientific data for three sets during the voyage. LO were trained how to capture an image of the whole fish, which for billfish means the image must be taken before the fish are gutted and gilled. LO were also trained and how to capture images of species that are not brought onboard the vessels such as pelagic stingray and ETP species such as thresher shark, oceanic whitetip shark and turtles. After returning from their fishing trip LO were contacted by pelagikos staff and debriefed in the harbour or in their homes using the Local Observer Trip Record Book. Trip, gear, set and catch information and data were checked with each LO (see image below right). A copy of the each vessel's Daily Catch Record Sheet was obtained from the DFAR's Harbour Office. Images taken of each capture species were transferred from the camera to a laptop and the outcome for each fish and ETP species caught was verified with the LO. The LO was paid LKR 10,000.00 (US\$51.00) per set up to a maximum of three sets (US\$ 160.00) for collecting fisheries information and data during the trip.





**Table 1 Details of the boats that returned with catch and scientific data**

	Name of the Local Observer	Boat No.	DFO	Departure		Arrival		Days	Sets	LOP
01	Mr. T.H. Indika Prabath	IMUL-A-1642 MTR	Matara	D1	08.09.2020	A1	16.10.2020	39	7	3
				D2	03.11.2020	A2	21.12.2020	48	14	5
02	Mr. L.H. Thilak Kumara	IMUL-A-1242 MTR	Matara	D1	12.09.2020	A1	17.10.2020	36	7	3
				D2	17.10.2020	A2	29.10.2020	13		4
03	Mr. A.H.P. Dinushka	IMUL-A-0788 MTR	Matara	D1	18.09.2020	A1	22.10.2020	35		3
				D2	10.11.2020	A2	03.12.2020	23		2
				D3		A3			3	3
04	Mr. A.H. Udana Indika	IMUL-A-1087 MTR	Matara					Incomplete data / FAILED		
05	Mr. A.G. D.S. Gunawardane	IMUL-A-0430 GLE	Galle					Incomplete data / FAILED		
06		IMUL-A-0890 GLE	Galle	D1	27.01.2021	A1				
07	Mr. W.N. Chaminda Fernando	IMUL-A-0713 NBO	Negombo	D1	13.08.2020	A1	17.09.2020	38	12	5
				D2	19.11.2020	A2	17.12.2020	28	12	4
08	Mr. Selan Malka	IMUL-A-0526 CHW	Chilaw	D1	19.08.2020	A1	28.09.2020	41	12	3
				D2	28.10.2020	A2	02.12.2020	35		3
09	Mr. Radisson Fernanado	IMUL-A-0264 CHW	Chilaw	D1	21.08.2020	A1	01.10.2020	42	12	4
				D2	15.12.2020	A2	23.01.2021	37	12	4
10	Mr. H.W.N.M. Kumara	IMUL-A-0728 NBO	Negombo	D1	26.08.2020	A1	17.10.2020	52		1
				D2	12.07.2020	A2				
11	Mr. Ananda Wedakumara	IMUL-A-0123 CBO	Colombo	D 1	04.09.2020	A 1	14.10.2020	41	22	3
				D2	18.10.2020	A2	07.12.2020	49	25	3
12	Mr. W.M.S Priyankakra	IMUL-A-0822 CHW	Chilaw	D 1	25.09.2020	A 1	18.11.2020	53	12	4
				D2	07.12.2020	A2	14.01.2021	37	10	4
13	Mr. W.A.S.J Pushpakumara	IMUL-A-0762 CHW	Chilaw	D 1	29.09.2020	A 1	25.11.2020	46	10	3
				D2	07.12.2020	A2	20.01.2021	43	5	1
14	Mr. P.P Sudesh	IMUL-A-0745 CHW	Chilaw	D 1	26.09.2020	A 1	31.10.2020	39	11	4
				D2	17.11.2020	A2	28.12.2020	39	12	1
15	Mr. W.N.S.T Fernando	IMUL-A-0737 NBO	Negombo	D 1	01.10.2020	A 1	26.11.2020	56	12	2
				D2	11.12.2020	A2				
16	Mr. Niroshan Kannangara	IMUL-A-0124 CBO	Colombo	D1	18.10.2020	A1	24.11.2020	36	15	3
17	Mr. S.Pushpakumara	IMUL-A-0699 CHW	Chilaw	D1	15.12.2020	A1				
								906	225	75



## Results & Analysis

Fifteen (15) of the 17 LO trained returned with digital data for one or more longline sets. Two boats from Matara failed to return with good data. Four boats are still in the water with the data of their 2<sup>nd</sup> trip (two from Negombo, one from Chilaw and one from Galle). All the other boats have finished the data collection of both 1<sup>st</sup> and 2<sup>nd</sup> trip.

The total number of sets observed was 75 (Table 2). The 15 vessels spent a total of 906 days at sea and set longline 225 times (with available logsheets) (Table 1). 50% of the sets were observed using the LOP. Digital data collected by each LO was processed by pelagikos due to the curfew and other restrictions implemented by the government in response to the COVID19 pandemic. 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 caught. The outcome (fate) for each fish or other captured species (*i.e.* retained or discarded dead or alive) was extracted from the Local Observer Trip Record Book. A sample LO Summary Report produced for each vessel is presented in Annex III.

### Trip / Gear / Set / Information and Data

100% of local observer information, 91% vessel information, 94% of the trip information and 94% of the gear information was successfully recorded using the LOP (Table 2). The average number of hooks per set was 1263. The total effort over the 75 sets observed was 94,732 hooks. The setting location and hauling location for the 75 sets observed is shown in Figure 1 (one boat has observed fish in one set, but they didn't mention the set points and hauling points correctly). The number of fish and other capture species observed by LO was 15% more than was recorded in the Daily Catch Record Book (Table 2).

### Catch and Scientific Data

The catch recorded by 15 LOs comprised of 1254 fish and other capture species. Staff of pelagikos were able to extract the set number, fish number, local name, English name, IOTC code and Outcome for more than 100% of the observed catch. Weight was recorded for 91% and length for 87% of the observed catch. Date and time data was extracted from all images. Location (latitude and longitude) data was successfully extracted from 95% of the observed catch. Scientific data was recorded from 97% of the observed catch (Target (T) = 423) collected by LO during the current phase of the local observer programme (Table 3).

**Table 3** Summary of scientific data collected

Scientific Data	T	A%
Set No	1254	100%
Fish No.	1254	100%
Local Name	1254	100%
English name	1254	100%
IOTC code	1254	100%

Scientific Data	T	A%
Outcome (R/RA/RD)	1254	100%
Weight(kg)	1170	93%
Folk Length(cm)	1111	89%
Date / Time	1254	100%
Location (Lat/Long)	1188	95%
<b>Scientific Data</b>	<b>12247</b>	<b>98%</b>

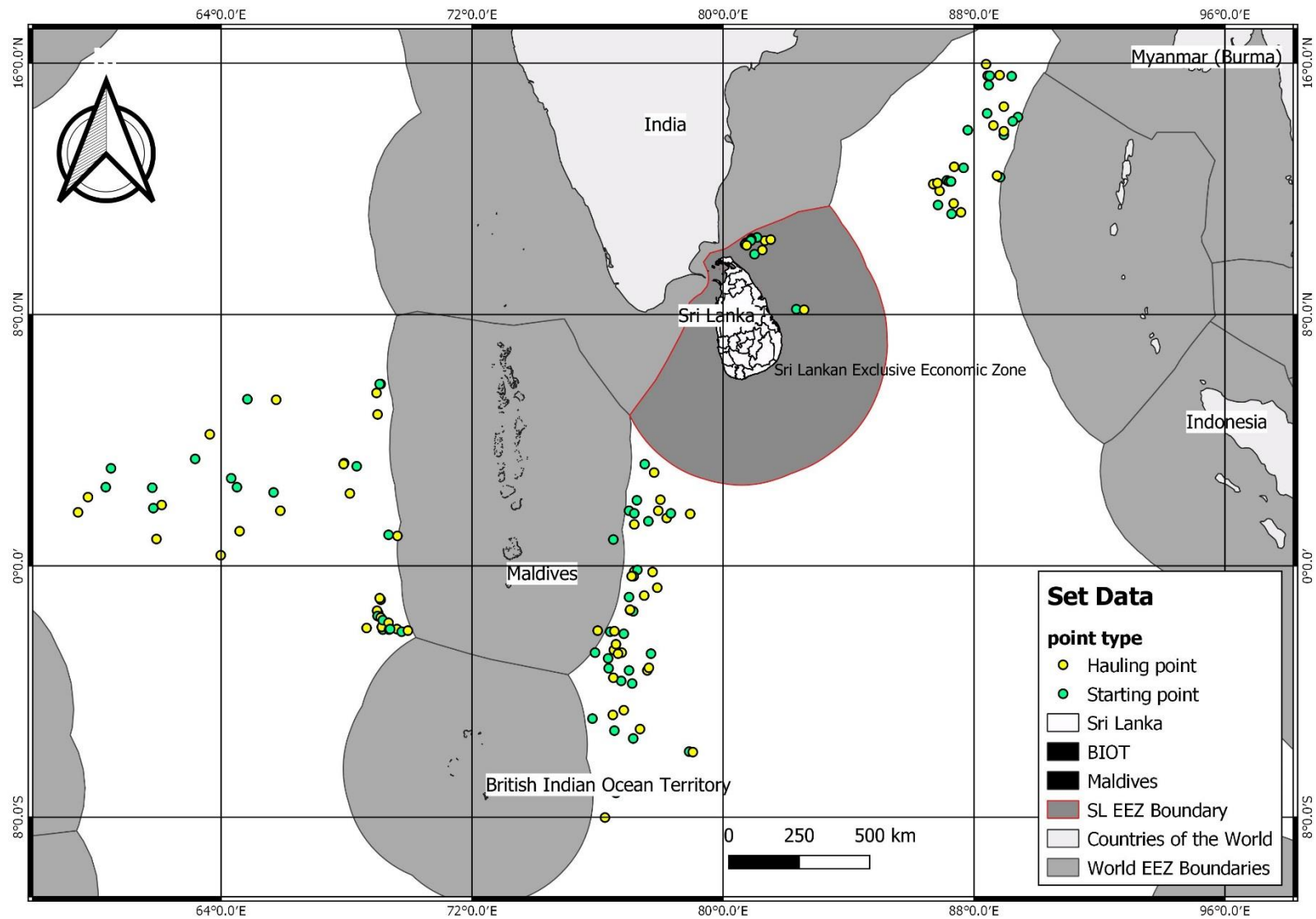


**Table 2** Trip, gear, effort, set and catch data

Boat Number	Local Observer			Vessel			Trip			Gear			Effort			Set				Catch		
	T	A	%	T	A	%	T	A	%	T	A	%	Hooks	Effort		T	T	A	%	T	A	%
IMUL-A-1642 MTR 1	9	9	100%	22	18	82%	9	9	100%	13	13	100%	500	1,500	3	7	6	6	100%	12	14	117%
IMUL-A-1642 MTR 2	9	9	100%	22	18	82%	9	9	100%	13	13	100%	1100	5,500	5	14	10	10	100%	99	72	73%
IMUL-A-1242 MTR 1	9	9	100%	22	17	77%	9	9	100%	13	12	92%	1200	3,600	3	7	6	6	100%	55	21	38%
IMUL-A-1242 MTR 2	9	9	100%	22	17	77%	9	9	100%	13	12	92%	1000	4,000	4		8	8	100%	13	24	185%
IMUL-A-0788 MTR 1	9	9	100%	22	22	100%	9	8	89%	13	13	100%	1500	4,500	3		6	6	100%	60	32	53%
IMUL-A-0788 MTR 2	9	9	100%	22	22	100%	9	6	67%	13	9	69%	1500	3,000	2		4	4	100%	45	28	62%
IMUL-A-0788 MTR 3	9	9	100%	22	22	100%	9	9	100%	13	13	100%	1600	4,800	3	3	6	4	67%			
IMUL-A-0713 NBO 1	9	9	100%	22	22	100%	9	9	100%	13	11	85%	1100	5,500	5	12	10	10	100%	47	92	196%
IMUL-A-0713 NBO 2	9	9	100%	22	22	100%	9	9	100%	13	11	85%	1000	4,000	4	12	8	8	100%	38	75	197%
IMUL-A-0526 CHW 1	9	9	100%	22	20	91%	9	9	100%	13	13	100%	1000	3,000	3	12	6	6	100%	12	37	308%
IMUL-A-0526 CHW 2	9	9	100%	22	20	91%	9	6	67%	13	13	100%	1200	3,600	3		4	4	100%		56	
IMUL-A-0264 CHW 1	9	9	100%	22	21	95%	9	8	89%	13	13	100%	1200	4,800	4	12	8	8	100%	24	65	271%
IMUL-A-0728 NBO 1	9	9	100%	22	17	77%	9	6	67%	13	13	100%	2000	2,000	1		0	0			17	
IMUL-A-0123 CBO 1	9	9	100%	22	19	86%	9	9	100%	13	11	85%	1600	4,800	3	22	6	6	100%	44	87	198%
IMUL-A-0123 CBO 2	9	9	100%	22	19	86%	9	9	100%	13	12	92%	1600	4,800	3	25	6	6	100%	80	87	109%
IMUL-A-0124 CBO 1	9	9	100%	22	19	86%	9	9	100%	13	12	92%	1500	4,500	3	15	6	6	100%	128	106	83%
IMUL-A-0762 CHW 1	9	9	100%	22	20	91%	9	9	100%	13	12	92%	2000	6,000	3	10	6	6	100%	102	70	69%
IMUL-A-0822 CHW 1	9	9	100%	22	19	86%	9	9	100%	13	12	92%	1100	4,400	4	12	8	8	100%	58	49	84%
IMUL-A-0737 NBO 1	9	9	100%	22	20	91%	9	9	100%	13	12	92%	1716	3,432	2	12	4	4	100%	22	37	69%
IMUL-A-0745 CHW 1	9	9	100%	22	21	95%	9	9	100%	13	12	92%	1000	4,000	4	11	8	8	100%	26	35	135%
IMUL-A-0745 CHW 2	9	9	100%	22	21	95%	9	9	100%	13	12	92%	1000	1,000	1	12	2	2	100%	11	5	46%
IMUL-A-0264 CHW 2	9	9	100%	22	21	95%	9	8	89%	13	13	100%	1000	4,000	4	12	8	8	100%	49	74	151%
IMUL-A-0762 CHW 2	9	9	100%	22	20	91%	9	9	100%	13	12	92%	2000	2,000	1	5	2	2	100%	29	23	79%
IMUL-A-0822 CHW 2	9	9	100%	22	21	95%	9	9	100%	13	13	100%	1500	6,000	4	10	8	8	100%	50	73	146%
	216	216	100%	528	478	91%	216	204	94%	312	292	94%	31916	94,732	75	225	146	144	99%	1004	1179	117%



Figure I - Locations of the 75 sets collected during the SEASL 4<sup>th</sup> Phase





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

29 species were observed in the catch recorded by the LO. 54.90%(by number) of the fish caught were the target species - yellowfin tuna (see Figure 2). 28 non-target (NT) species were observed in the catch (Table 4 and Figure 3), out of which four were ETP species *i.e.* oceanic whitetip shark, Bigeye thresher, Olive ridley and loggerhead turtle (Annex II, Table 4 and Figure 4). Bigeye tuna (14.82%), swordfish (7.63%), black marlin (4.28%), blue shark (3.71%), sailfish (3.12%), blue marlin (2.98%), escolar (1.74%), Spinetail mobula (1.52%), silky shark (1.24%) and albacore (1.06%) and were the main NT species caught

The catch per unit effort (CPUE per 1,000 hooks) for yellowfin tuna was 4.90 by number of fish and 181.3 kg by weight (Table 4)

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

Species name	No		CPUE <sup>4</sup>	Total Weight(kg)		CPUE <sup>5</sup>	Min (kg)	Max (kg)	Av. kg
<b>Target species</b>									
Yellowfin tuna	465	37.1%	4.91	17183	54.9%	181.4	8	90	37.4
<b>Other capture species</b>									
Bigeye tuna	140	11.2%	1.48	4640	14.8%	49.0	2	130	33.4
Swordfish	80	6.4%	0.84	2388	7.6%	25.2	1	150	31.0
Black marlin	31	2.5%	0.33	1340	4.3%	14.1	17	95	44.7
Blue shark	30	2.4%	0.32	1160	3.7%	12.2	20	70	38.7
Indo-Pacific sailfish	55	4.4%	0.58	977	3.1%	10.3	4	40	18.4
Blue marlin	25	2.0%	0.26	934	3.0%	9.9	3	100	37.4
Escolar	108	8.6%	1.14	545	1.7%	5.7	0.5	23	5.1
Spinetail mobula	9	0.7%	0.10	475	1.5%	5.0	25	80	52.8
Silky shark	38	3.0%	0.40	388	1.2%	4.1	1	50	11.1
Albacore	21	1.7%	0.22	331	1.1%	3.5	4	30	15.8
Wahoo	28	2.2%	0.30	215	0.7%	2.3	2	20	7.7
Skipjack tuna	44	3.5%	0.46	162	0.5%	1.7	2	15	3.9
Ribbon fish	59	4.7%	0.62	129	0.4%	1.4	1	10	3.2
Striped marlin	2	0.2%	0.02	85	0.3%	0.9	40	45	42.5
Common dolphinfish	13	1.0%	0.14	68	0.2%	0.7	1	10	5.2
Crocodile shark	17	1.4%	0.18	60	0.2%	0.6	1	8	3.5
Pelagic stingray	38	3.0%	0.40	55	0.2%	0.6	1	5	2.9
Shortbill spearfish	6	0.5%	0.06	39	0.1%	0.4	7	15	9.8
Oilfish	1	0.1%	0.01	17	0.1%	0.2	17	17	17.0
Grouper	2	0.2%	0.02	6	0.0%	0.1	3	3	3.0
Rainbow runner	2	0.2%	0.02	6	0.0%	0.1	3	3	3.0
Trevally	1	0.1%	0.01	3	0.0%	0.0	3	3	3.0
Atlantic pomfret	1	0.1%	0.01	1	0.0%	0.0	1	1	1.0
Ocean Sunfish	1	0.1%	0.01		0.0%	0.0			
<b>Protected species</b>									

<sup>4</sup> No/1,000 hooks

<sup>5</sup>kg per 1,000 hooks



Oceanic whitetip shark	11	0.9%	0.1	75	0.2%	0.8	4	10	7.5
Olive ridley	23	1.8%	0.2	10	0.0%	0.1	10	10	10.0
Bigeye thresher	2	0.2%	0.0	10	0.0%	0.1	5	5	5.0
Loggerhead	1	0.1%	0.0	0	0.0%	0.0			
	<b>1254</b>			<b>31301.5</b>					

### Outcome

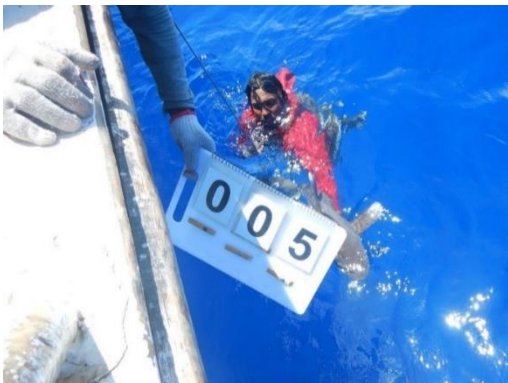
86.9% of the observed catch was retained (1090 specimens). 4.1% was discarded alive (51 specimens) and the remaining catch (9.1% / 114 specimens) was discarded dead (Table 5). The species other than the target species retained included Bigeye tuna 11.2%, escolar, swordfish, sail fish, blue shark, albacore, (<10% of the catch). Pelagic stingray and several ETP oceanic whitetip shark and loggerhead turtle were the main species discarded alive (Table 5). Ribbonfish, pelagic stingray, crocodile shark, blue shark were the main species discarded dead.

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

Species	Retained	%	Discarded Live	%	Discarded dead	%
<b>Target species</b>						
Yellowfin tuna	465	42.7%	0	0.0%	0	0.0%
<b>Non-target species</b>						
Bigeye tuna	140	12.8%	0	0.0%	0	0.0%
Escolar	100	9.2%	0	0.0%	8	4.8%
Swordfish	80	7.3%	0	0.0%	0	0.0%
Indo-Pacific sailfish	55	5.0%	0	0.0%	0	0.0%
Skipjack tuna	43	3.9%	0	0.0%	0	0.0%
Silky shark	38	3.5%	0	0.0%	0	0.0%
Black marlin	31	2.8%	0	0.0%	0	0.0%
Wahoo	28	2.6%	0	0.0%	0	0.0%
Blue shark	27	2.5%	0	0.0%	3	1.8%
Blue marlin	25	2.3%	0	0.0%	0	0.0%
Albacore	21	1.9%	0	0.0%	0	0.0%
Common dolphinfish	13	1.2%	0	0.0%	0	0.0%
Spinetail mobula	9	0.8%	0	0.0%	0	0.0%
Shortbill spearfish	6	0.6%	0	0.0%	0	0.0%
Rainbow runner	2	0.2%	0	0.0%	0	0.0%
Striped marlin	2	0.2%	0	0.0%	0	0.0%
Oilfish	1	0.1%	0	0.0%	0	0.0%
Trevally	1	0.1%	0	0.0%	0	0.0%
Ribbon fish	0	0.0%	2	1.2%	57	34.5%
Pelagic stingray	0	0.0%	18	10.9%	20	12.1%
Crocodile shark	0	0.0%	1	0.6%	16	9.7%
Grouper	0	0.0%	0	0.0%	2	1.2%
Atlantic pomfret	0	0.0%	0	0.0%	1	0.6%
Ocean Sunfish	0	0.0%	0	0.0%	1	0.6%
Skipjack tuna	0	0.0%	0	0.0%	1	0.6%

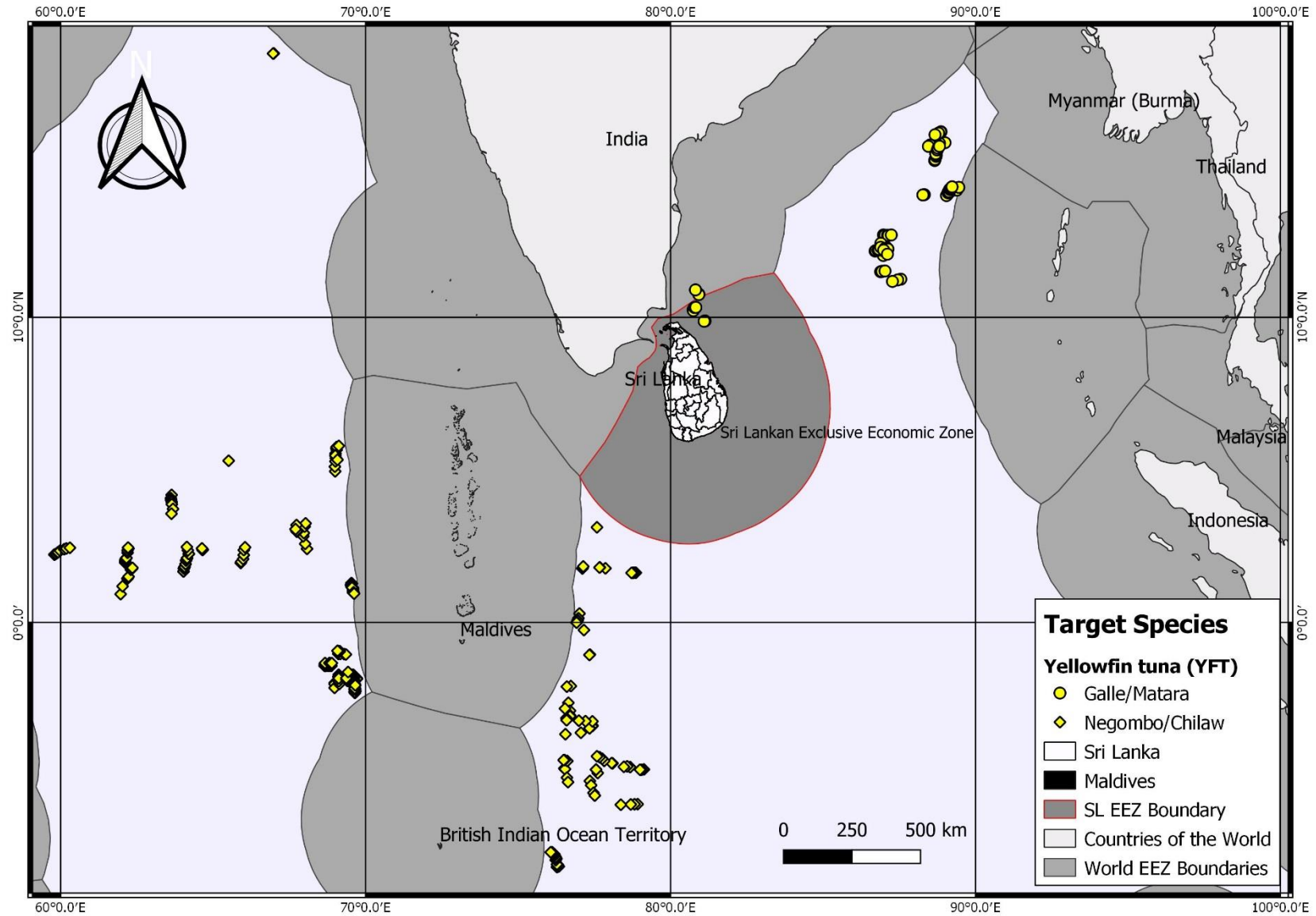


Protected species						
Oceanic whitetip shark	1	0.1%	5	3.0%	5	3.0%
Olive ridley	0	0.0%	24	14.5%	0	0.0%
Loggerhead	0	0.0%	1	0.6%	0	0.0%
Bigeye thresher	2	0.2%	0	0.0%	0	0.0%
<b>Total</b>	<b>1090</b>	<b>86.9%</b>	<b>51</b>	<b>4.1%</b>	<b>114</b>	<b>9.1%</b>





**Figure 2 - Locations of the target species – Yellowfin tuna – observed**





**Figure 3 - Locations of other capture species observed in the catch**

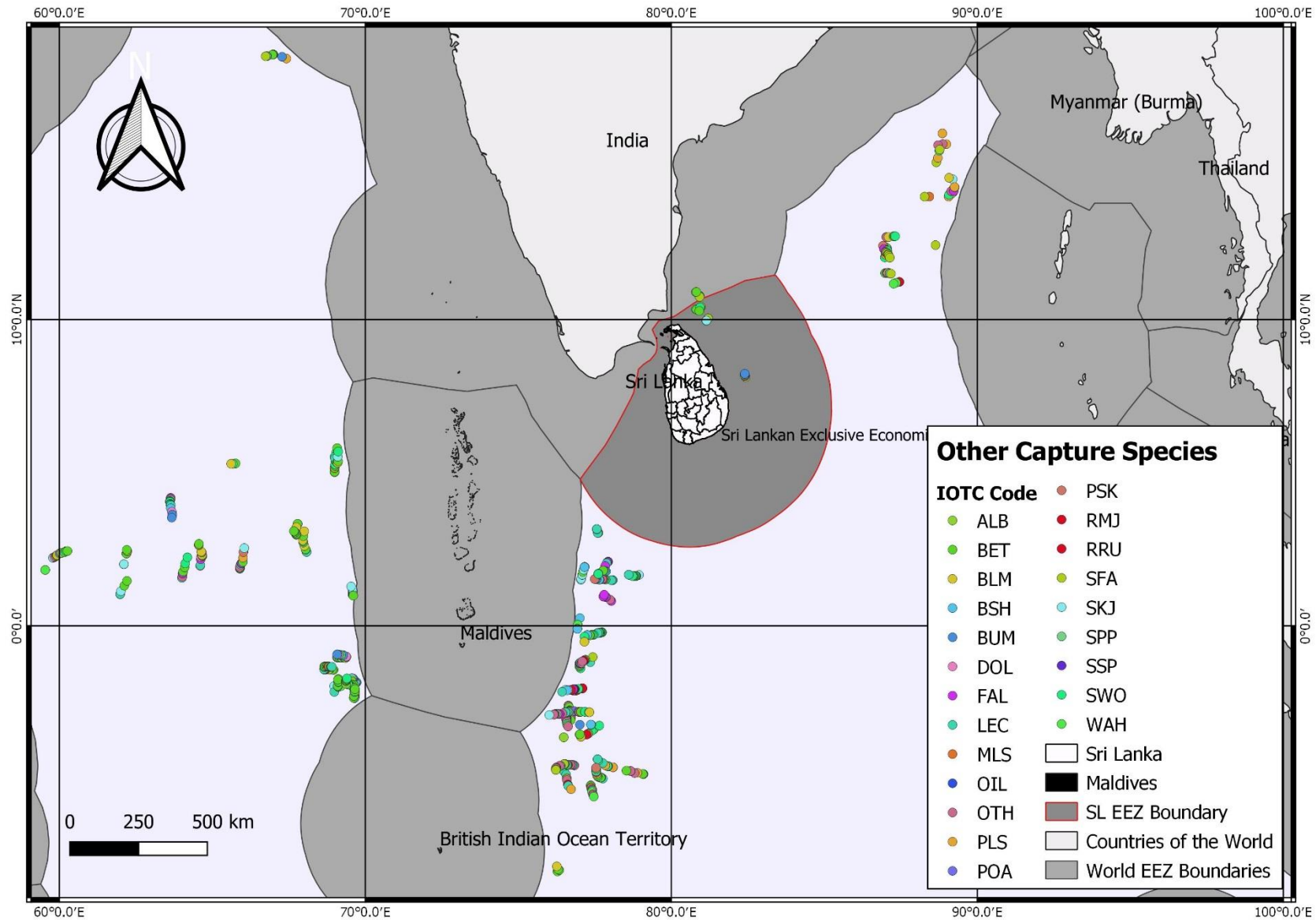
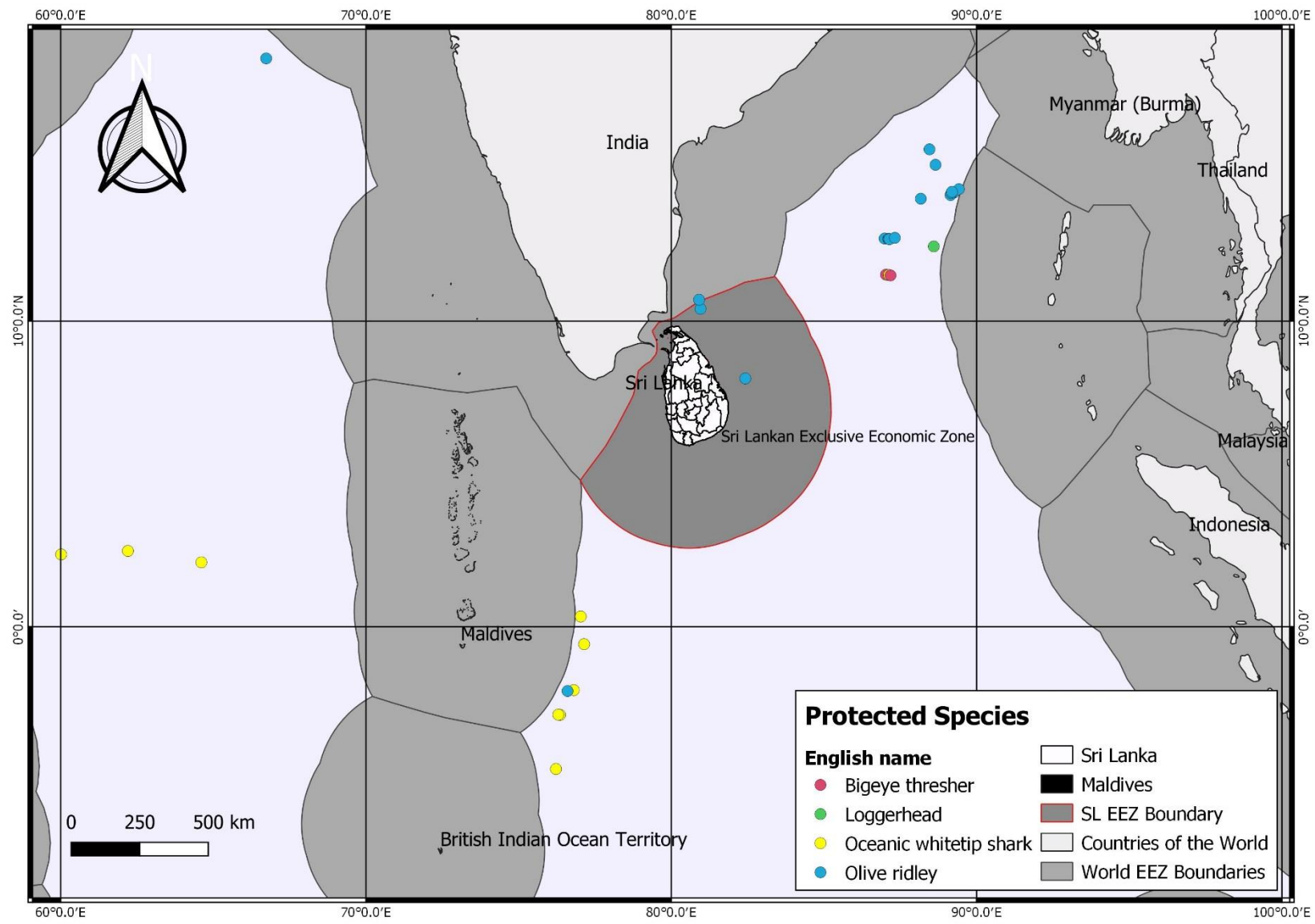




Figure 4 - Locations of protected species observed in the catch



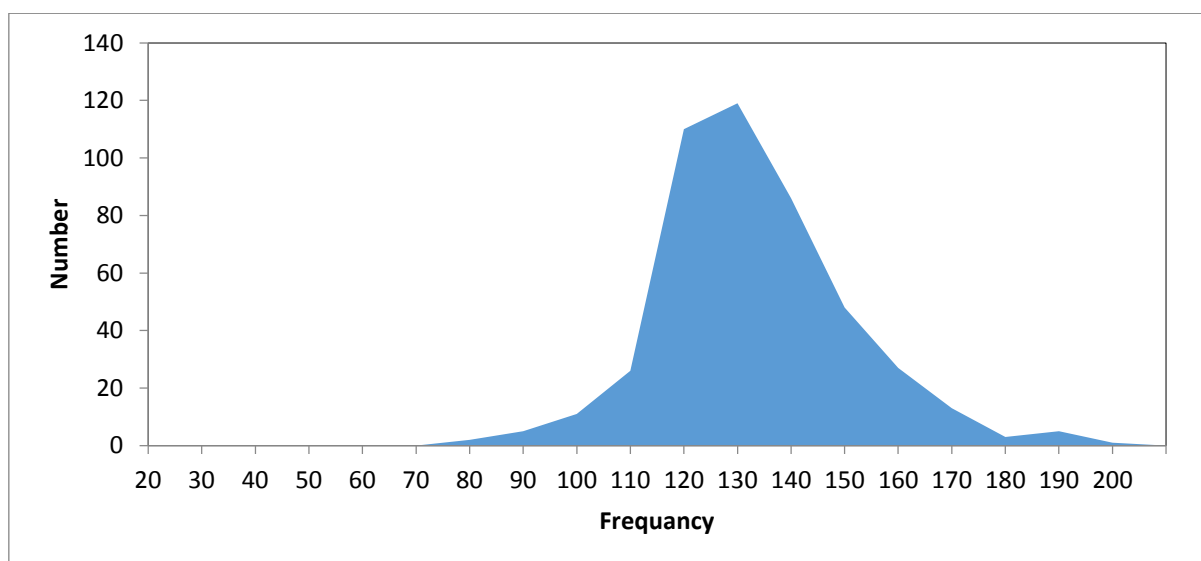


### Target Species Analysis

Fork length (FL) data was extracted from images of yellowfin tuna by pelagikos for 456 individual fish. Length frequency for yellowfin tuna observed during the current phase of the local observer programme is shown in Figures 4. The minimum (FL) observed were 72.3 cm and maximum was 192.6 cm. The average size of yellowfin tuna caught was 128.1 cm (STDEV 17.4 cm). According to data available on Fishbase<sup>6</sup> 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*). 95% of the yellowfin tuna caught by Sri Lanka's short longline yellowfin tuna vessels during the the current phase were above the  $L_{m50}$ .

### Figure 5 Length frequency for YFT under the third phase of the local observer programme

*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



### ETP Species Analysis

Four ETP species represented were thirty eight specimens / individuals equivalent to 3% of the total catch observed during the current phase. Eleven oceanic whitetip shark was observed, representing 1%% of the catch (by number) and one were retained, five were discarded dead and five were discarded alive. Two retained bigeye thresher were observed (0.2%). Twenty four olive ridley turtle (1.9%) and one loggerhead turtle (0.1%) were observed and all of them were discarded alive.

<sup>6</sup> [www.fishbase.de](http://www.fishbase.de)



## Discussion

The local observer protocol used during the current phase of the local observer programme enabled the collection of more fisheries information and data (66 variables) compared to the third phase (40 variables see Table 6). The overall recovery of fisheries information and data targeted under the current phase was 98%. The LOP used during the current phase enabled LO to collect verified trip (94%), gear (94%), set (99%), catch (117%) and scientific (98%) information and data from 75 sets from 15 vessels over a period of five months. The cost of collecting fisheries information and data from 75 sets was **US\$ 2,750.00**.

**Table 6** Comparative analysis of the LOP in the pilot, second and current phase.

Local Observer Programme	Overall			Trip		Gear		Set		Catch		Scientific	
	n	%		n	%	n	%	n	%	n	%	n	%
SEASL 3.0	66	98%		40	94%	13	94%	2	99%	1	117%	10	98%
SEASL 2.0	40	98%		16	96%	10	91%	2	91%	1	114%	11	97%
SEAPACT 1	36	98%		14	97%	8	100%	2	89%	1	105%	11	97%
SEAPACT 1	37	66%		14	81%	8	100%	2	87%	1	30%	12	31%

The information of the current phase were collected by referring the IOTC variables that collecting information by national observers. Therefore the number of variables were high (66).

Data collection of current phase were expanded to southern coast of Sri Lanka (Matara and Galle). Therefore following difficulties were aroused during the data gathering.

- Fishermen in the southern area were not very helpful and flexible comparing to the fishermen in the Western coast
- The departure harbor and the arrival harbor of the most of the boats of southern coast are different. Therefore finding the logsheets became more difficult than other phases
- Unable to find three logsheets (one from Matara, one from Chilaw and one from Negombo). Reasons were to difficulty of finding logsheet from Matara, some boats are fishing in the highses with expired license and putting way points within EEZ, Some boats are fishing with longline for few days and fishing with handline for remain.
- Most of the skippers southern botas are not completing logsheet properly. Most of the skipper were put ten or twelve days of harvest to only three days.
- Most of the boats in southern coast are doing IUU fishing.
- Some of the southern botas are using combination gears ; longline, handline, purse seine and gillnet for fishing

Therefore following recommendations were proposed for the future data collection

- There need to be have proper way of collecting logsheet when collecting data from the skipper
- The skippers from southern coast need to be select according to proper way



## Conclusion

The results of the current phase of the local observer programme further demonstrates the effectiveness of the LOP to collect independently *verifiable catch and other scientific data related to fisheries for tuna and tuna-like species in the IOTC area of competence* from Sri Lanka's large fleet of small-scale multi-day boat longline fishing vessels that fish outside of Sri Lanka's EEZ. The results of the current phase of the local observer programme supports the argument that LO are a credible alternative to the deployment of independent observers, which would enable Sri Lanka to comply with IOTC's Resolution 11/04 – on a regional observer scheme. Furthermore the cumulative observations generated by the LOP over the four phases for endangered, threatened and protected (ETP) species suggest that Sri Lanka's longline fisheries for yellow-fin and bigeye tuna and swordfish have a reasonable chance to moving from 'fail' to 'conditional pass' against the MSC Fishery Standard in 2022, if information and data about ETP species continues to be collected using the LOP



## Annex I Indian Ocean Tuna Commission Resolution 11/04

TAKING INTO ACCOUNT the need to increase the scientific information, in particular to provide the IOTC Scientific Committee working material in order to improve the management of the tuna and tuna-like species fished in the Indian Ocean;

REITERATING the responsibilities of flag States to ensure that their vessels conduct their fishing activities in a responsible manner, fully respecting IOTC Conservation and Management Measures;

CONSIDERING the need for action to ensure the effectiveness of the IOTC objectives;

CONSIDERING the obligation of all IOTC Contracting Parties and Cooperating Non-Contracting Parties (hereinafter CPCs) to fully comply with the IOTC Conservation and Management Measures;

AWARE of the necessity for sustained efforts by CPCs to ensure the enforcement of IOTC's Conservation and Management Measures, and the need to encourage Non-Contracting Parties (NCPs) to abide by these measures;

UNDERLINING that the adoption of this measure is intended to help support the implementation of Conservation and Management Measures as well as scientific research for tuna and tuna-like species;

CONSIDERING the provisions set forth in Resolution 10/04 *On A Regional Observer Scheme* [superseded by [resolution 11/04](#)], adopted by the Commission;

CONSIDERING the deliberations of the 12th Session of the IOTC Scientific Committee held in Victoria, Seychelles from 30 November to 4 December 2009

ADOPTS, in accordance with the provisions of Article IX, paragraph 1 of the IOTC Agreement, the following:

### **Objective**

1. The objective of the IOTC observer scheme shall be to collect verified catch data and other scientific data related to the fisheries for tuna and tuna-like species in the IOTC area of competence.

### **Observer Scheme**

2. In order to improve the collection of scientific data, at least 5 % of the number of operations/sets for each gear type by the fleet of each CPC while fishing in the IOTC area of competence of 24 meters overall length and over, and under 24 meters if they fish outside their Exclusive Economic Zone (EEZ) shall be covered by this observer scheme. For vessels under 24 meters if they fish outside their EEZ, the above mentioned coverage should be achieved progressively by January 2013.

3. When purse seiners are carrying an observer<sup>1</sup> as stated in paragraph 1, this observer shall also monitor the catches at unloading to identify the composition of bigeye tuna catches. The requirement for the observer to monitor catches at unloading is not applicable to CPCs already having a sampling scheme, with at least the coverage set out in paragraph 2.



4. The number of the artisanal fishing vessels landings shall also be monitored at the landing place by field samplers<sup>2</sup>. The indicative level of the coverage of the artisanal fishing vessels should progressively increase towards 5% of the total levels of vessel activity (i.e. total number of vessel trips or total number of vessels active).

5. CPCs shall:

- a. Have the primary responsibility to obtain qualified observers. Each CPC may choose to use either deployed national or non-national of the flag State of the vessel on which they are deployed;
- b. Endeavour that the minimum level of coverage is met and that the observed vessels are a representative sample of the gear types active in their fleet;
- c. Take all necessary measures to ensure that observers are able to carry out their duties in a competent and safe manner;
- d. Endeavour to ensure that the observers alternate vessels between their assignments. Observers are not to perform duties, other than those described in paragraphs 10 and 11 below;
- e. Ensure that the vessel on which an observer is placed shall provide suitable food and lodging during the observer's Phase at the same level as the officers, where possible. Vessel masters shall ensure that all necessary cooperation is extended to observers in order for them to carry out their duties safely including providing access, as required, to the retained catch, and catch which is intended to be discarded.

6. The cost of the observer scheme in paragraph 2 and 3 shall be met by each CPC.

7. The sampling scheme referred in paragraph 4 will be covered by the Commission's accumulated funds and voluntary contribution on a provisional basis. The Commission will consider an alternative for the financing of this scheme.

8. If the coverage referred in paragraphs 2 and 3 is not met by a CPC, any other CPC may, subject to the consent of the CPC who has not met its coverage, place an observer to fulfil the tasks defined in the paragraphs 1 and 2 until that CPC provides a replacement or the target coverage level is met.

9. CPCs shall provide to the IOTC Executive Secretary and the IOTC Scientific Committee annually a report of the number of vessels monitored and the coverage achieved by gear type in accordance with the provisions of this Resolution.

10. Observers shall:

- a. Record and report fishing activities, verify positions of the vessel;
- b. Observe and estimate catches as far as possible with a view to identifying catch composition and monitoring discards, by-catches and size frequency;
- c. Record the gear type, mesh size and attachments employed by the master;
- d. Collect information to enable the cross-checking of entries made to the logbooks (species composition and quantities, live and processed weight and location, where available); and
- e. Carry out such scientific work (for example, collecting samples), as requested by the IOTC Scientific Committee.



11. The observer shall, within 30 days of completion of each trip, provide a report to the CPCs of the vessel. The CPCs shall send within 150 days at the latest each report, as far as continuous flow of report from observer placed on the longline fleet is ensured, which is recommended to be provided with 1°x1° format to the IOTC Executive Secretary, who shall make the report available to the IOTC Scientific Committee upon request. In a case where the vessel is fishing in the EEZ of a coastal State, the report shall equally be submitted to that coastal State.

12. The confidentiality rules set out in the Resolution 98/02 **[superseded by [Resolution 12/02](#)]** *Data confidentiality policy and procedures for fine-scale data* shall apply.

13. Field samplers shall monitor catches at the landing place with a view to estimating catch-at-size by type of boat, gear and species, or carry out such scientific work as requested by the IOTC Scientific Committee.

14. The funds available from the IOTC balance of funds may be used to support the implementation of this programme in developing States, notably the training of observers and field samplers.

15. The elements of the Observer Scheme, notably those regarding its coverage, are subject to review and revision, as appropriate, for application in 2012 and subsequent years. Basing on the experience of other Tuna RFMOs, the IOTC Scientific Committee will elaborate an observer working manual, a template to be used for reporting (including minimum data fields) and a training program.

16. This Resolution supersedes Resolution 10/04 *On A Regional Observer Scheme*.

#### **Footnotes:**

1. **Observer:** a person who collects information on board fishing vessels. Observer programmes can be used for quantifying species composition of target species, bycatch, by-products and dead discards, collecting tag returns, etc.
2. **Field sampler:** a person who collects information on land during the unloading of fishing vessels. Field sampling programmes can be used for quantifying catch, retained bycatch, collecting tag returns, etc



Annex II	Marine mammals, reptiles, sharks and rays protected in Sri Lanka under the Fauna and Flora Protection Ordinance (FFPO- 1948) and the Fisheries and Aquatic Resources Act (FARA 1996)
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Scientific Name / Common Name	FFPO	FARA
<b>Class : Reptilia (Reptiles)</b>		
<b>Family : Crocodylidae</b>		
<i>Crocodylus palustris</i> – Mugger / Marsh crocodile	X	
<i>Crocodylus porosus</i> – Saltwater / Estuarine crocodile	X	
<b>Family : Cheloniidae</b>		
<i>Caretta caretta</i> - Loggerhead sea turtle	X	
<i>Chelonia mydas</i> - Green turtle	X	
<i>Eretmochelys imbricata</i> - Hawksbill sea turtle	X	
<i>Lepidochelys olivacea</i> - Oliver ridley sea turtle	X	
<b>Family : Dermochelyidae</b>		
<i>Dermochelys coriacea</i> - Leatherback sea turtle	X	
<b>Class Elasmobranchii (Sharks)</b>		
<b>Family - Carcharhinidae</b>		
<i>Carcharhinus longimanus</i> - Oceanic whitetip shark		X
<b>Family - Alopiidae</b>		
<i>Alopias pelagicus</i> - Pelagic thresher		X
<i>Alopias superciliosus</i> - Bigeye thresher		X
<i>Alopias vulpinus</i> - Thintail thresher		X
<b>Family - Rhincodontidae</b>		
<i>Rhincodon typus</i> - Whale shark		X



**Local Observer Programme**  
**Sri Lanka Longline Fishery Improvement Project**  
**Phase IV – Chilaw/Negombo**  
**Summary Report**  
**IMUL-A-0526 CHW**

The boat was departure on 19<sup>th</sup> of August 2020 and they were arrived on 28<sup>th</sup> of September 2020 (41 days). During the trip they were fished for 12 days and collected data LOP for 03 days.

<b>Log Sheet No.</b>	LB-18 3609 <sup>13</sup>
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Table 01: Local observer and deployment details of IMUL-A-0526 CHW vessel

<b>Local Observer and Deployment details</b>		
Local Observer Name	Mr. W. M. Selan malka	
Local Observers' ID No.	SL0459CHW	
Age & Experience	27	8
Nationality	Sri Lankan	
Local Observer Address	Ganga mawatha, Thoduwawa N	
Local observer Contact number	077-3381950	
Boat owner name	Mr. M. S. Susantha Kumara	
Boat owner Address	Ganga Mawatha, Thoduwawa North	
Boat owner contact number	076-6028155	

Table 02: Vessel details of IMUL-A-0526 CHW vessel

<b>Vessel Details</b>	
Vessel Name	Marian - 4
National reg. no	IMUL-A-0526 CHW
IOTC reg. no	IOTC10189
Radio call sign	4SF2342
Vessel type	Multipurpose
No. of crew	6
EEZ	EEZ19IMUL6171CHW
High seas	
Gross Tonnage (GT)	23GT
Overall Length (m)	12 m
Fish storage capacity (kg)	
Blast freezer capacity (m <sup>3</sup> )	(No blast freezing facilities)
Refrigeration method	Ice cold fish hold
Fish storage method	Bulking



Table 03: Electronic Equipment details of IMUL-A-0526 CHW vessel

Vessel Electronic Equipment	Availability (Y/N)
Acoustic equipment	No
Position fixing equipment (GPS)	Yes
Vessel monitoring system (VMS)	Yes
Radars	No
Communication equipment	Yes
Plotters	No
AIS buoys	Yes
CCTV system	No

Table 04: Trip details of IMUL-A-0526 CHW vessel

Trip Details		
Departure date and time	19.08.2020	
Arrival date and time	28.09.2020	
Departure location		
Fishery harbor	Latitude	Longitude
Dikovita	7.005812	79.867046
Arrival location		
Fishery harbor	latitude	Longitude
Dikovita	7.005812	79.867046
Date start fishing	28.08.2020	
Date end fishing	24.09.2020	
Total time lost	28	
Total no. of operations/sets	12	
No. observed operations	3	

Table 04: Gear details of IMUL-A-0526 CHW vessel

Gear details (Longline)		
Main line length (km)	64 km	
Float line length (m)	30 m	
Branch line length (m)	44 m	
Depth Set (m)	74 m	
No. of baskets	100	
Hooks per basket	7	
Total no. hooks	1000	
Hook type & size	J hook	
Main line material	Tangus	
Bait Species	Milk fish	
Live bait   Dead bait   Artificial bait	Dead bait	
Dye color	No	
Hooked? (single or double)	Single	



Table 05: Set data of IMUL-A-0526 CHW vessel

Set data of the vessel						
Set No.	Date	Starting GPS		Date	Hauling GPS	
		S	E		S	E
1	30.08.2020	1° 25'	77° 02'	31.08.2020	0° 57'	77° 29'
2	14.09.2020	5° 30'	77° 08'	15.09.2020	5° 12'	77° 21'
3	16.09.2020	5° 15'	76° 32'	17.09.2020	4° 45'	76° 29'

Table 06: Summary table on scientific data of IMUL-A-0526 CHW vessel

Scientific data			
Variables	Total	Completed	%
Local Name	37	37	100%
English Name	37	37	100%
IOTC Code	37	37	100%
R/D	37	37	100%
Weight	37	36	97%
Standard Length	37	32	86%
Longitude/Latitude	37	37	100%

Table 07: Summary table on data collection of IMUL-A-0526 CHW vessel

Summary			
Variables	Total	Completed	%
Local Observer Details	9	9	100%
Vessel Details	22	20	91%
Trip Details	9	9	100%
Gear Details	13	13	100%
Set Details	6	6	100%
Catch Details	12	37	308%

Table 08: Comments of the observation of IMUL-A-0526 CHW vessel

Comments of the Observation	



Figure 01: Identified fishing activity locations of IMUL-A-0526 CHW vesse

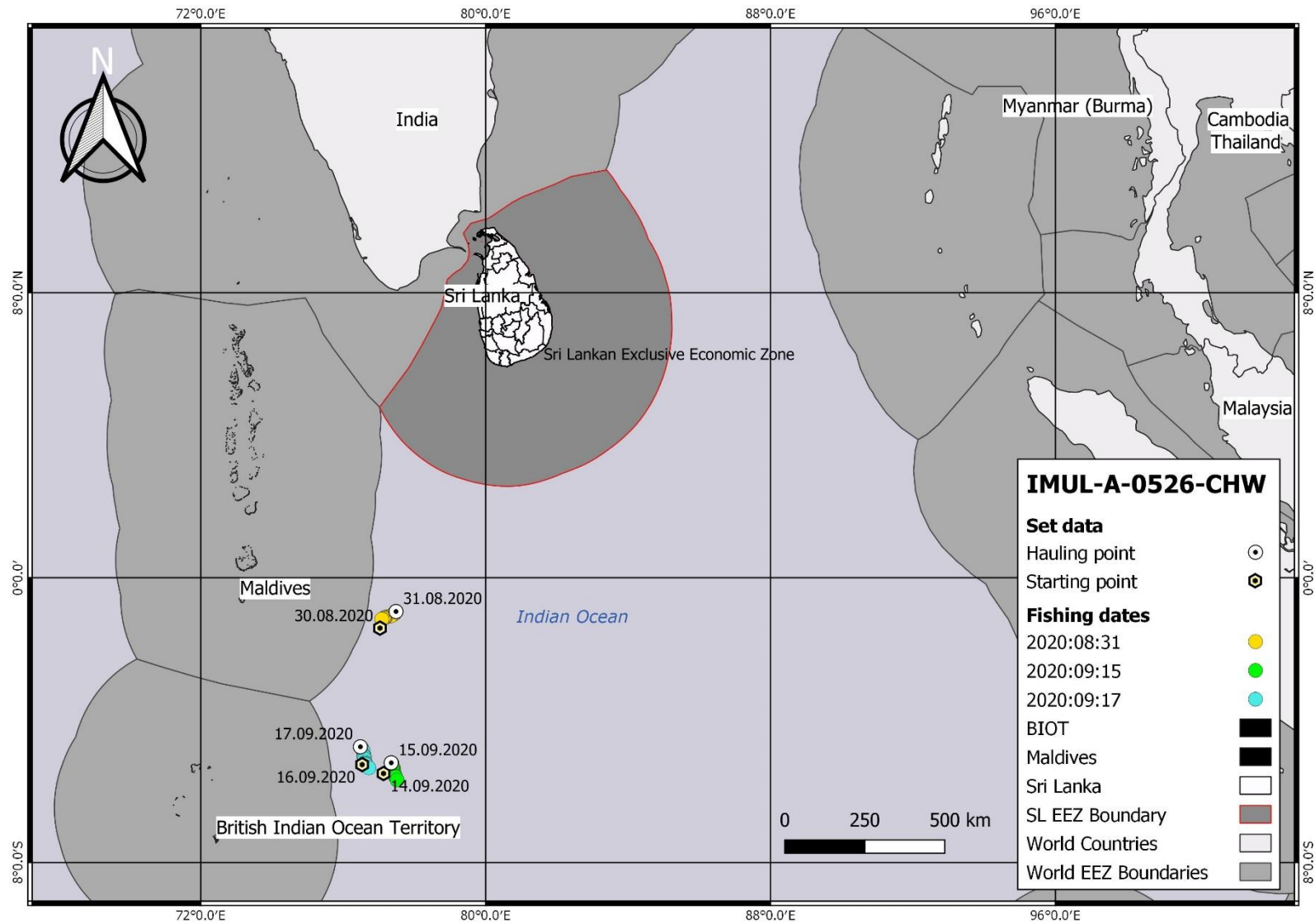




Table 09: LL LOP Catch data information sheet of IMUL-A-0526 CHW vessel

Catch Information										
No	Vessel ID	Set No	IOTC code	Fate	W (kg)	L (cm)	Latitude	Longitude	Date	Time
1	526CHW	1	SFA	R	5	100.00	-1.0237	77.4311	2020:08:31	8:43:16
2	526CHW	1	YFT	R	35	120.87	-1.0577	77.3535	2020:08:31	10:15:41
3	526CHW	1	YFT	R	30	118.26	-1.0713	77.3384	2020:08:31	10:39:16
4	526CHW	1	SWO	R	15	120.95	-1.1094	77.1939	2020:08:31	16:52:38
5	526CHW	1	BLM	R	40	176.00	-1.1200	77.1647	2020:08:31	17:38:12
6	526CHW	1	RMJ	R	50	208.24	-1.1359	77.1474	2020:08:31	18:13:01
7	526CHW	1	RMJ	R	70	174.44	-1.1611	77.1120	2020:08:31	20:05:20
8	526CHW	1	OTH	DD	1		-1.1644	77.0857	2020:08:31	20:31:22
9	526CHW	2	YFT	R	58	149.52	-5.2047	77.3525	2020:09:15	7:09:13
10	526CHW	2	BET	R	70	112.41	-5.2136	77.3654	2020:09:15	7:29:48
11	526CHW	2	YFT	R	3	60.44	-5.2211	77.3666	2020:09:15	7:41:02
12	526CHW	2	BSH	DD	30	150.00	-5.2739	77.3738	2020:09:15	8:37:34
13	526CHW	2	PLS	DD	3	25.93	-5.2873	77.3810	2020:09:15	8:54:19
14	526CHW	2	PLS	DD	8	72.67	-5.3202	77.3845	2020:09:15	9:24:34
15	526CHW	2	YFT	R	36	120.83	-5.3454	77.3950	2020:09:15	9:48:40
16	526CHW	2	SFA	R	15	147.62	-5.3540	77.4084	2020:09:15	10:03:37
17	526CHW	2	OTH	DD			-5.3610	77.4144	2020:09:15	10:10:38
18	526CHW	2	LEC	R	6	94.50	-5.3913	77.4085	2020:09:15	10:38:24
19	526CHW	2	WAH	R	6	118.40	-5.4292	77.4069	2020:09:15	11:10:05
20	526CHW	2	OTH	DD	3		-5.5023	77.4352	2020:09:15	12:07:52
21	526CHW	2	OTH	DD	1		-5.5393	77.4488	2020:09:15	12:37:16
22	526CHW	2	WAH	R	4	99.26	-5.5797	77.4641	2020:09:15	13:20:28
23	526CHW	2	YFT	R	42	135.65	-5.5945	77.4717	2020:09:15	13:36:41
24	526CHW	2	YFT	R	40	130.83	-5.6825	77.5140	2020:09:15	15:18:27
25	526CHW	3	SWO	R	60	167.78	-4.7671	76.5041	2020:09:17	7:17:41
26	526CHW	3	YFT	R	46	136.52	-4.7940	76.5146	2020:09:17	7:47:31
27	526CHW	3	YFT	R	30	123.33	-4.8157	76.5364	2020:09:17	8:16:15
28	526CHW	3	LEC	R	3	57.86	-4.8621	76.5605	2020:09:17	9:03:00
29	526CHW	3	PLS	DD	3	24.52	-4.9798	76.5816	2020:09:17	10:38:12
30	526CHW	3	SFA	R	10	137.27	-5.0018	76.5840	2020:09:17	10:55:40
31	526CHW	3	OTH	DD	3		-5.0393	76.5846	2020:09:17	11:24:45
32	526CHW	3	YFT	R	30	98.62	-5.0963	76.6015	2020:09:17	12:28:58
33	526CHW	3	RRU	R	3	59.52	-5.1856	76.6169	2020:09:17	15:02:07
34	526CHW	3	PLS	DD	3	33.10	-5.2261	76.6279	2020:09:17	15:42:06
35	526CHW	3	LEC	R	5	75.79	-5.2302	76.6297	2020:09:17	15:46:20
36	526CHW	3	YFT	R	32	114.84	-5.2416	76.6355	2020:09:17	16:00:14
37	526CHW	3	PLS	DD	2	32.90	-5.3389	76.7195	2020:09:17	17:42:50



[illegible]

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