MSC ETP SPECIES UPDATE TO THE PRE-ASSESSMENT OF THE SEAFOOD EXPORTERS ASSOCIATION OF SRI LANKA LONGLINE FISHERY FOR YELLOWFIN TUNA, BIGEYE TUNA AND SWORDFISH

Fishery name	:	Seafood Exporters' Association of Sri Lanka Longline fishery
Fishery location	:	Sri Lanka's Exclusive Economic Zone and International Waters in the Indian Ocean
Report authors	:	S. J. Norman
Email	:	stewart@capfish.co.za
Author association	:	Capricorn Marine Environmental Pty Ltd
Address	:	Unit 15, Foregate Square, Cape Town, South Africa
Client name	:	Seafood Exporters Association of Sri Lanka
Client contact	:	Steve Creech
E-Mail	:	steve@pelagikos.lk
Client address	:	28 Joseph's Lane, Colombo 4, Sri Lanka,
Date	:	16 April 2021

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Objectives

- The general aim of the project is to carry out an update of the ETP species PIs for the Sri Lankan Longline Fishery.
- Specific objectives are to:

  1. to review new information and data collected by the longline FIP over the past two years against MSC Principle Indicators for ETP species (i.e. 2.3.1 - Outcome; 2.3.2 - Management and 2.3.3 Information).

  2. to review the Final Reports prepared at the end of deployment of local observers in 2018, 2019 and 2020; as well as a paper presented by the Department of Fisheries and Aquatic Resources (DFAR) at the IOTC Working Party on Data and Statistics in 2020 and the draft or final report arising out of that IOTC meeting.

  3. to review the data collected by the observer program through analysis of the observer database.

Expected deliverables

- A concise report concluding whether the fishery has:

  1. collected enough information and data about ETP species caught accidentally in Sri Lanka's longline fishery for yellowfin and bigeye tuna and swordfish (PI2.3.3); and

  2. the outcome for ETP species (PI 2.3.1);

  to improve the fisheries' score from FAIL to a PASS with conditions against these two indicators in the MSC Fishery Standard.

- Whether as a result of the new information collected there is any change in PI 3.3.2 - Management?

- An updated version of the original Scoring Issues table for each of the three ETP PIs.

Overview of the Fishery

Sri Lanka has over 4,000 multi day boats engaged in large pelagic fishing in both high seas and within EEZ. 1,449 vessels are authorized to fish in high seas. VMS is mandatory for high seas operating vessels. Multi-gear vessels are being promoted to longline by introducing mechanized line haulers and the upgrading of vessel conditions to accommodate better cooling systems to improve the fish quality and reduce the post economic loss. High fuel cost has restricted the year round vessel operations and most vessels are being kept anchored. Electronic catch data collection system is being implemented and carried out parallel to the paper log books. On board observers were deployed in all vessels >24m and pilot project on EMS is on-going. Port State Measures are being implemented through epsm application. Coastal data collection system is being improved by introducing better sampling techniques and to achieve the length frequency data in required proportion.

99% of the high seas operating vessels are <24m length overall (LOA). Due to the small size of these vessels and the health and safety concerns associated with the deployment of independent observers on such small vessels, Sri Lanka to date has been unable to meet the IOTC's minimum independent data reporting requirements for its beyond EEZ fishing fleet under Resolution 11/04.

Two options – a Crew-based (Local) Observer Programme and an Electronic Observer Programme - have been proposed to collect minimum independent trip, gear, set, catch and scientific data from Sri Lanka's less than 24 m multi-day fishing fleet. A sub project under the Sri Lankan Longline Fishery Improvement Project (FIP) was launched to investigate the potential of a Crew-based (Local) Observer Programme in 2018. The sub project was implemented through the Department of Fisheries & Aquatic Resources (DFAR) Electronic Data Unit (EDU) in Colombo and the District Fisheries Offices (DFO) in Negombo and Chilaw. The sub project was implemented in collaboration with the multi-day boat owners' associations in Negombo and Chilaw. The Crew-based (Local) Observer Programme was subsequently extended to cover longline fishing vessels operating on the south coast under the DFO in Galle and Matara.

Crew-based (Local) Observer Programme for Vessels < 24m

The Department of Fisheries and Aquatic Resources (DFAR) collects catch data from all offshore (EEZ) and high seas (beyond EEZ) multi-day fishing vessels through the Logbook / Catch Certificate system. This data is focused on the key commercial / export species (i.e. yellowfin and bigeye tuna, swordfish, sailfish and marlins). Some information on ETP species is also collected through the Logbook system. For vessels measuring more than 24 m length overall the DFAR collects verified catch data and other scientific data related to Sri Lanka's fisheries for tuna and tuna-like species in the IOTC area of competence through its National Observer Programme. However as noted above, health and safety concerns on-board vessels less than 24 m preclude the deployment of National Observers as used on > 24 m vessels (see below), on the majority of Sri Lanka's multi-day fishing vessels registered with the IOTC to fish on the high seas.

The Crew-based Local Observer (LO) protocol combines existing, mandatory logbook information and data, semi-structured post-harvest interviews and independently verifiable, electronic data collected using digital cameras, tablets and smartphones. In 2018 LO were asked to collect information, data and images for every fish caught from all sets (Table 1). This proved to be impractical for LO. As a consequence only partial information about the catch was reported for most sets (see SEAPACT Pilot Phase Report for details).

In 2019 and 2020 LO were tasked to collect information, data and images for every fish caught from a maximum of three sets per trip (Table 1). This proved to be much more practical for LO (i.e. skippers / crew). The new protocol enabled the local observer programme to collect information and data about the catch for a sub-sample (3 sets) from each voyage (see SEAPACT Final Report for details).

The observed catch data for vessels <24 m, including all retained, discarded alive and discarded dead catch, that were collected are summarised in Table 4. Weight of fish is estimated by eye and for individuals that are discarded (dead/alive) accurate weight estimates are difficult to make, for this reason number of fish observed is also presented.

The putative UoA is comprised of 400 longline vessels and each boat averages 7 trips per year with each trip an average of sets is made with 1,350 hooks per set.

Thus for 3 years (2018-2020) one can assume approximately 2,800 trips (400 x 7) were made by vessels fishing in the UoA. Of those trips 268 sets were observed (107 + 45 + 116) or 9.57% of the total fishing effort. Using this rough estimate it is possible to extrapolate the likely catches for the fishery raised to the total fishing effort. The final columns in Table 4 display these figures for number of fish and weight of fish. These crude estimates are useful to determine the total impact of the UoA on ETP species under PI 2.3.1 relative to the total catches by all fleets in the Indian Ocean. The proportion contribution of each species to the catch does not change.

Table 1: Number of trips and sets observed by Local Observer during the Pilot and Second phases of the project.

Year	Number of observed trips	Number of sets	Number of sets observed
2018*	17	107	107
2019	17	150	45
2020	42	362	116

*Pilot phase

National Observer Program for vessels >24 m.

Since 2018, there has been an increase in the number of foreign built > 24 m vessels licensed by Sri Lanka to operate on the high seas. These vessels are Sri Lankan flagged, skippered and crewed mainly by foreign crews. Sri Lanka meets the IOTC's minimum independent data reporting requirements for > 24 m vessels fishing fleet under Resolution 11/04 through the National Observer Programme (Table 2). Reports are submitted to the IOTC by DFAR following each observed trip. The Sri Lanka National Report to the IOTC Scientific Commission (IOTC-2020-SC23-NR21) summarizes observed interactions with ETP species.

Table 2: Number and type of vessel >24 m operating in the IOTC area of jurisdiction flagged by Sri Lanka 2014-2020 that are observed by the National Observer Program administered by DFAR.

Year	Vessel type	Number of Vessel – 24m<	Number of fishing operations	Number of observer coverage	% of Observer coverage
2014	Purse Seine	8	10	2	20%
2015	Long line	2	2	2	100%
2016	Long line	0	0	0	0%
2017	Long line	2	15	2	13.3%
2018	Long line	2	9	2	22.2%
2019	Long line	18	86	5	5.8%
2020	Long line	20	63	7	11.1%

Unit of Assessment (UoA) and Unit of Certification (UoC)

The UoA defines the full scope of what is being assessed, and includes the Unit of Certification (UoC) and any other eligible fishers. The UoA includes the target stock(s), the fishing method or gear type/s, vessel type/s and/or practices, and the fishing fleets or groups of vessels, or individual fishing operators pursuing that stock, including any other eligible fishers that are outside the Unit of Certification.

There is no change to the Unit of Assessment defined during the 2018 pre-assessment (Table 3). There are however approximately 20 large-scale (> 24 m) tuna longline vessels flagged by Sri Lanka. The operational characteristics of the vessels (>24m) mark them as distinct from the locally built, fishing community owned, locally skippered and crewed < 24 semi-industrial longline vessels. Although the target species, stock and broad definition of gear type are similar to the original UoAs (i.e. longline), the >24m industrial vessels are managed as a separate category by the DFAR and governed by IOTC Resolutions such that these vessels form a separate sub-component of the Sri Lankan longline fleet. The vessels are monitored through the National Observer Program managed by the Department of Aquatic Resources (DFAR). Information collected by the National Observer Program (NOP) is submitted to the IOTC Secretariat.

Five national observer reports were shared with the assessor. A summary of the observed catch data from those reports is presented in

Table 8. Comparing the observed catch profile for in Table 4 (LOP) versus that presented in (NOP) it is clear that the retained species profile is quite similar however there is far less information on discarded or released species and generally fewer species in the catch profile derived from the NOP data. This may be on account that the vessels >24 m are fishing exclusively for the export market therefore one would expect more discards vs retained catch (commercially valuable for export target species only) on the >24 m vessels. The information and scientific data contained in the reports was insufficient at this time to form the basis of an assessment either standalone or in comparison to the information and data generated by the local observer programme. For that reason the assessment of Principle 2 would require further information gathering specific to those vessels and subsequent analysis against P2 performance indicators.

It is recommended at this stage that based on the variation in the use of longline gear between the two sub-components of the fleet, the distinction between vessel types (see Figure 1and Figure 2) and the lack of information on the >24 m vessels that this sub-component of the fleet is not included within the UoAs previously defined. The operational characteristics of the vessels are sufficiently different and catch data is sufficiently distinct from the locally operated small scale longline fishing vessels to warrant definition of a separate UoA. Noting the intent of the updated Fisheries Certification Process V2.2 section 7.5.2 that the UoA be defined based not on the manner in which gear is deployed but rather on the type of gear used one could argue that the two sub-components form a combined UoA, however, where the vessel type(s) between fleet sub-components are sufficiently different 7.5.2 b recognizes the possibility of defining a separate UoA (bold emphasis below).

7.5.2 The CAB shall determine the proposed UoA (i.e. what is to be assessed) to include:

a. The target stock(s).
b. The fishing gear type(s) **and, if relevant, vessel type(s)**.
c. The fishing fleets or groups of vessels, or individual fishing operators pursuing that stock, including any other eligible fishers that are outside the proposed Unit of Certification (UoC).

If the >24m component of the longline fleet was assessed against the MSC Standard the Principle 1 scores would match those of the current assessment. For Principle 3.1.x the scores likewise would be similar. For PIs 3.2.x which are Fishery–specific in their focus there would likely be some difference in scoring especially around decision-making processes (3.2.2) and compliance & enforcement (3.2.3).

Table 3: Units of Assessment and Units of Certification for the Seafood Exporters Association of Sri Lanka Longline Fishery.

UoA 1 / UoC	
Species:	Yellowfin tuna (*Thunnus albacares*)
Stock:	Indian Ocean Yellowfin tuna
Geographical area:	Exclusive Economic Zone (EEZ) of the Democratic Socialist Republic of Sri Lanka and the north-west waters of the Indian Ocean
Harvest method:	Longline
Management:	Local: Ministry of Fisheries & Aquatic Resources (MFAR); Regional: Indian Ocean Tuna Commission (IOTC)
Client group:	Department of Fisheries and Aquatic Resources
Other eligible fishers:	The Sri Lankan vessels licensed for large pelagic longline fishing within the 200 mile Sri Lankan EEZ and on the High Seas waters of the Indian Ocean that carry longline gear **only**. There are no other eligible vessels in this fishery.

UoA 2 / UoC	
Species:	Bigeye tuna (*Thunnus obesus*)
Stock:	Indian Ocean Bigeye tuna
Geographical area:	Exclusive Economic Zone (EEZ) of the Democratic Socialist Republic of Sri Lanka and the north-west waters of the Indian Ocean
Harvest method:	Longline
Management:	Local: Ministry of Fisheries & Aquatic Resources (MFAR); Regional: Indian Ocean Tuna Commission (IOTC)
Client group:	Department of Fisheries and Aquatic Resources
Other eligible fishers:	The Sri Lankan vessels licensed for large pelagic longline fishing within the 200 mile Sri Lankan EEZ and on the High Seas waters of the Indian Ocean that carry longline gear **only**. There are no other eligible vessels in this fishery.

UoA 3 / UoC	
Species:	Swordfish (*Xiphius gladius*)[1]
Stock:	Indian Ocean swordfish
Geographical area:	Exclusive Economic Zone (EEZ) of the Democratic Socialist Republic of Sri Lanka and the north-west waters of the Indian Ocean
Harvest method:	Longline
Management:	Local: Ministry of Fisheries & Aquatic Resources (MFAR); Regional: Indian Ocean Tuna Commission (IOTC)
Client group:	Department of Fisheries and Aquatic Resources
Other eligible fishers:	The Sri Lankan vessels licensed for large pelagic longline fishing within the 200 mile Sri Lankan EEZ and on the High Seas waters of the Indian Ocean that carry longline gear **only**. There are no other eligible vessels in this fishery.

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[1] We raised the concern here that as is common **practice** globally, swordfish-directed fishing using longlines normally involves a different fishing operation – that is longline gear for tuna is modified (normally set deeper than for YFT), hooks and traces may change, different baits are normally used, as well as the use of light sticks.

Catch Profile

Table 4: Observed catch Profile for Sri Lankan longline < 24 m multi-day fishing fleet 2018-2020 (Source Sri Lanka LOP).

Scientific name	English common name	Total observed number of fish (2018-2020)	Proportion (%)	Total observed weight (kg) 2018-2020	Average observed wight per annum (2018-2020)	Proportion (%)	Estimated total number of individuals based on ratio of observed fishing effort to total estimated fishing effort for the UoA (2018-2020)	Estimated total weight of catch (kg) based on ratio of observed fishing effort to total estimated fishing effort for the UoA (2018-2020)	Estimated annual average weight of the catch (tons) for the UoA (2018-2020)
Thunnus albacares	Yellowfin tuna	15806	52.868%	54135	18045	62.180%	165137	565590	188.530
Thunnus obesus	Bigeye tuna	2056	6.877%	7143	2381	8.204%	21481	74628	24.876
Makaira indica	Black marlin	1175	3.930%	7101	2367	8.156%	12276	74190	24.730
Xiphias gladius	Swordfish	1907	6.379%	6540	2180	7.512%	19924	68328	22.776
Istiophorus platypterus	Indo-Pacific sailfish	1540	5.151%	3520	1173	4.043%	16090	36776	12.259
Makaira nigricans	Blue marlin	509	1.703%	1833	611	2.105%	5318	19151	6.384
Prionace glauca	Blue shark	492	1.646%	1528	509	1.755%	5140	15964	5.321
Lepidocybium flavobrunneum	Escolar	1513	5.061%	794.5	265	0.913%	15807	8301	2.767
Mobula japanica	Spinetail mobula	125	0.418%	635	212	0.729%	1306	6634	2.211
Carcharhinus falciformis	Silky shark	442	1.478%	595	198	0.683%	4618	6216	2.072
Thunnus alalunga	Albacore	412	1.378%	412	137	0.473%	4304	4304	1.435
Alopius sp.	Thresher sharks	55	0.184%	323	108	0.371%	575	3375	1.125
Trichiurus lepturus	Ribbon fish	991	3.315%	297.5	99	0.342%	10354	3108	1.036
Isurus oxyrinchus	Shortfin mako shark	25	0.084%	285	95	0.327%	261	2978	0.993
Acanthocybium solandri	Wahoo	383	1.281%	258	86	0.296%	4001	2696	0.899
Dermochelys coriacea	Leatherback turtle	43	0.144%	230	77	0.264%	449	2403	0.801
Carcharhinus longimanus	Oceanic whitetip shark	220	0.736%	224	75	0.257%	2299	2340	0.780
Tetrapturus audax	Striped marlin	19	0.064%	200	67	0.230%	199	2090	0.697
Katsuwonus pelamis	Skipjack tuna	511	1.709%	185	62	0.212%	5339	1933	0.644
Isurus paucus	Longfin Mako Shark	16	0.054%	115	38	0.132%	167	1201	0.400

Coryphaena hippurus	Common dolphinfish	221	0.739%	93	31	0.107%	2309	972	0.324
Pteroplatytrygon violacea	Pelagic stingray	510	1.706%	90	30	0.103%	5328	940	0.313
Pseudocarcharias kamoharai	Crocodile shark	281	0.940%	85	28	0.098%	2936	888	0.296
Galeocerdo cuvier	Tiger shark	20	0.067%	70	23	0.080%	209	731	0.244
Tursiops truncatus	Common Bottlenose Dolphin	20	0.067%	66	22	0.076%	209	690	0.230
Mobula thurstoni	Smoothtail mobula	9	0.030%	65	22	0.075%	94	679	0.226
Lepidochelys olivacea	Olive ridley	256	0.856%	60	20	0.069%	2675	627	0.209
Mobula tarapacana	Chilean devilray	15	0.050%	40	13	0.046%	157	418	0.139
Tetrapturus angustirostris	Shortbill spearfish	47	0.157%	39	13	0.045%	491	407	0.136
Brama brama	Atlantic Pomfret	34	0.114%	26	9	0.030%	355	272	0.091
Sphyraena barracuda	Great barracuda	60	0.201%	24	8	0.028%	627	251	0.084
Ruvettus pretiosus	Oilfish	16	0.054%	17	6	0.020%	167	178	0.059
Alopias superciliosus	Bigeye thresher	22	0.074%	10	3	0.011%	230	104	0.035
Scomberomorus guttatus	Indo-Pacific king mackerel	7	0.023%	7	2	0.008%	73	73	0.024
Serranidae	Grouper	50	0.167%	6	2	0.007%	522	63	0.021
Elagatis bipinnulata	Rainbow runner	23	0.077%	6	2	0.007%	240	63	0.021
Carangidae	Trevally	24	0.080%	3	1	0.003%	251	31	0.010
Tetraodon fluviatilis	Puffer fish	4	0.013%	1	0	0.001%	42	10	0.003
Molidae	Ocean Sunfish	25	0.084%		0	0.000%	261	0	0.000
Caretta caretta	Loggerhead turtle	13	0.043%		0	0.000%	136	0	0.000
	Grand Total	29897	100.000%	87062	29020.67	100.000%	312357	909603	303,201

Species coding key:

Target species
Main Primary species
Minor Primary species
Minor Secondary species
ETP species

Table 5: Total observed number and volume of fish retained by the UoA 2018-2020 (Source Sri Lanka LOP).

English name	Number of retained fish	Volume (kg) of retained fish
Albacore	412	412
Bigeye thresher	22	10
Bigeye tuna	2056	7143
Black marlin	1175	7101
Blue marlin	509	1833
Blue shark	470	1365
Common dolphinfish	221	93
Escolar	1407	711.5
Great barracuda	60	24
Indo-Pacific king mackerel	7	7
Indo-Pacific sailfish	1540	3520
Oceanic whitetip shark	13	7
Oilfish	16	17
Rainbow runner	23	6
Shortbill spearfish	47	39
Shortfin mako	16	35
Shortfin Mako Shark	9	250
Silky shark	382	590
Skipjack tuna	490	180
Smoothtail mobula	9	65
Spinetail mobula	125	635
Striped marlin	19	200
Swordfish	1907	6540
Trevally	24	3
Wahoo	383	258
Yellowfin tuna	15801	54015
Grand Total	**27143**	**85059.5**

Table 6: Total observed number and volume of fish discarded dead by the UoA 2018-2020 (Source Sri Lanka LOP).

English name	Number of fish discarded dead	Volume (kg) of fish discarded dead
Atlantic Pomfret	34	26
Blue shark	22	163
Crocodile shark	229	64
Escolar	106	83
Grouper	50	6
Letherback turtle	28	60
Longfin Mako Shark	16	115
Ocean Sunfish	9	
Oceanic whitetip shark	88	102
Pelagic stingray	204	44
Puffer fish	4	1
Ribbon fish	947	292.5
Silky shark	29	3
Skipjack tuna	21	5
Thresher Shark	39	223
Tiger shark	20	70
Yellowfin tuna	5	120
Grand Total	**1851**	**1377.5**

Table 7: Total observed number and volume of fish discarded alive by the UoA 2018-2020 (Source Sri Lanka LOP).

English name	Number of fish discarded alive	Volume (kg) of fish discarded alive
Chilean devilray	15	40
Common Bottlenose Dolphin	20	66
Crocodile shark	52	21
Leatherback turtle	15	170
Loggerhead turtle	13	
Oceanic whitetip shark	119	115
Olive Ridley turtle	256	60
Pelagic stingray	306	46
Ribbon fish	44	5
Silky shark	31	2
Sun Fish	16	
Thresher sharks	16	100
Grand Total	**903**	**625**

Table 8: Summary of observed catch onboard vessels >24 m LOA. Source DFAR.

English common name	Species code	Fate			Total observed weight (kg)
		Discarded Dead (kg)	Discarded Alive (kg)	Retained (kg)	
Yellowfin tuna	YFT			5450	5450
Bigeye	BET			1372	1372
Swordfish	SWO			408	408
Blue Marlin	BUM			400	400
Albacore	ALB			220	220
Black Marlin	BLM			195	195
Escolar	LEC			141	141
Wahoo	WAH			94	94
IndoPacific sailfish	SFA			81	81
Skipjack	SKJ			68	68
Blue shark	BSH			60	60
Dolphinfish	DOL			51	51
Silky shark	FAL			42	42
Other	OTH	30			30
Oceanic Whitetip shark	OCS	8			8
Shortbill spearfish	SSP			7	7
Crocodile shark	PSK	5			5
Pelagic stingray	PLS		3		3
Grand Total		**43**	**3**	**8589**	**8635**

ETP species overview

ETP species are defined by the MSC (MSC 2018a) as species that are:

i)   Recognised by national ETP legislation,

ii) Listed on Appendix I of CITES (unless it can be shown that the particular stock of the CITES listed species impacted by the UoA under assessment is not endangered),

iii) Listed in any binding agreements concluded under the Convention on Migratory Species (CMS), or

iv) Classified as 'out-of-scope' (amphibians, reptiles, birds and mammals) that are listed in the IUCN Redlist as vulnerable (VU), endangered (EN) or critically endangered (CE).

Sri Lanka is a Party to the Convention on Migratory Species (CMS). The MSC has clarified that Parties to the CMS are required to 'endeavour to provide immediate protection for migratory species included in Appendix I of the CMS' and to 'endeavour to conclude Agreements covering the conservation and management of migratory species included in Appendix II'. Agreements are adopted to reflect the direct conservation needs of species and the requirements of regions (Sant et al, 2012). Species listed in any of these shall be classified as ETP for the purposes of an MSC assessment. (GSA3.1.5.2, MSC 2018a). Only species listed in Appendix I of the CMS or in agreements concluded under the CMS are considered to be ETP. Species listed in non-binding memoranda of understanding concluded under the CMS are not considered ETP (SA3.1.5.2.b, MSC 2018a).

Table 9:   **Rationale for treating species caught by the Sri Lnakan longline fishery as ETP based on MSC requirements under SA 3.1.5 (MSC 2018a).**

Species	Catch (% of total)	IOTC	CITES	CMS	IUCN
Spinetail Devil Ray (Mobula japonica)	0.729%	Prohibition on retention, transhipment, landing, etc. (IOTC 19/03).	Appendix II : (CITES Appendices)	Appendix I: (CMS Appendices)	Species is 'in scope' for MSC, so IUCN status is not relevant.
Silky shark[1] Carcharhinus falciformis	0.683%	No specific non-retention ban.	Appendix II: (CITES Appendices)	Appendix II: (CMS Appendices)	Species is 'in scope' for MSC, so IUCN status is not relevant.
Thresher sharks (Alopius sp.) including Bigeye thresher shark (Alopias superciliosus)	0.382%	Prohibition on retention, transhipment, landing, etc. (IOTC 12/09).	Appendix II: (CITES Appendices)	Appendix II: (CMS Appendices)	Species is 'in scope' for MSC, so IUCN status is not relevant.
Leatherback turtle (Dermochelys coriacea)	0.264%	Handling and release procedures in place (IOTC 12/04).	Appendix I: (CITES Appendices)	Appendix I: (CMS Appendices)	Not possible to assess.

Species	%	Non-retention	CITES	CMS	IUCN Status
Oceanic whitetip shark (Carcharhinus longimanus)	0.257%	Prohibition on retention, transhipment, landing, etc. (IOTC 13/06).	Appendix II: (CITES Appendices)	Appendix I: (CMS Appendices)	Species is 'in scope' for MSC, so IUCN status is not relevant.
Common Bottlenose Dolphin (Tursiops truncatus)	0.076%	No specific non-retention ban.	Appendix II: (CITES Appendices) Black Sea population	Appendix I: (CMS Appendices) Black sea population	Vulnerable (Bearzi et al 2012).
Smoothtail mobula (Mobula thurstoni)	0.075%	Prohibition on retention, transhipment, landing, etc. (IOTC 19/03).	Appendix II : (CITES Appendices)	Appendix I: (CMS Appendices)	Species is 'in scope' for MSC, so IUCN status is not relevant.
Olive Ridley sea turtle (Lepidochelys olivacea)	0.069%	Handling and release procedures in place (IOTC 12/04).	Appendix I: (CITES Appendices)	Appendix I: (CMS Appendices)	Vulnerable (Abreu-Grobois & Plotkin 2008).
Chilean devil ray (Mobula tarapacana)	0.046%	Prohibition on retention, transhipment, landing, etc. (IOTC 19/03).	Appendix II : (CITES Appendices)	Appendix I: (CMS Appendices)	Species is 'in scope' for MSC, so IUCN status is not relevant.
Loggerhead sea turtle (Caretta caretta)	0.000%	Handling and release procedures in place (IOTC 12/04).	Appendix I: (CITES Appendices)	Appendix I: (CMS Appendices)	Global: Vulnerable (Casale & Tucker 2017). Northeast Indian Ocean: Critically endangered (Casale 2015a). Southeast Indian Ocean: Near threatened (Casale et al. 2015). Southwest Indian Ocean: Near threatened (Nel & Casale 2015). Northwest Indian Ocean: Critically endangered (Casale 2015b).

[1] Silky shark are recognized by overlapping MSC fisheries as ETP species in the Indian Ocean, on a precautionary basis it is recommended that they be considered as an ETP species for this assessment.

For ETP species it is informative to present the total number of interactions. This is because most are released / discarded and weight estimates can be unreliable (see Table 5, Table 6, Table 7).

Table 10: Recorded number of interactions with each ETP species by the UoA according to the LOP. Observed interactions were then raised to the total annual estimated fishing effort for the UoA.

Scientific name	English common name	Total observed number of fish (2018-2020)	Estimated total number of individuals based on ratio of observed fishing effort to total estimated fishing effort for the UoA (2018-2020)	Estimated annual average number of ETP individuals caught by the UoA (2018-2020)
Mobula japanica	Spinetail mobula	125	1306	435
Carcharhinus falciformis	Silky shark	442	4618	1539
Alopius sp.	Thresher sharks	55	575	192
Dermochelys coriacea	Leatherback turtle	43	449	150
Carcharhinus longimanus	Oceanic whitetip shark	220	2299	766
Tursiops truncatus	Common Bottlenose Dolphin	20	209	70
Mobula thurstoni	Smoothtail mobula	9	94	31
Lepidochelys olivacea	Olive ridley	256	2675	892
Mobula tarapacana	Chilean devilray	15	157	52
Alopias superciliosus	Bigeye thresher	22	230	77
Caretta caretta	Loggerhead turtle	13	136	45
	Total ETP species interactions	1220	12746	4249

ETP species management

IOTC measures relevant to longline fisheries and for each of the ETP species group are listed here and referenced in more detail for each scoring element when scoring the respective Performance Indicators. A list of active CMMs is available at http://www.iotc.org/cmms.

Sharks.

- Resolution 17/05 established that CPCs shall take the necessary measures to require that their fishermen fully utilize their entire catches of sharks, with the exception of species prohibited by the IOTC.

- Resolution 18/02 asks CPCs to ensure that effective management measures are in place to support the sustainable exploitation of blue shark by improving data reporting and scientific research.

- Resolution 12/09 prohibits the retention on board of all species of thresher sharks, a group that is thought to be particularly vulnerable due to its low productivity.

- Resolution 13/06 On a scientific and management framework on the conservation of shark species caught in association with IOTC managed fisheries

- Resolution 13/06 prohibits the retention of oceanic whitetip sharks.

Rays.

- Resolution 19/03 On the Conservation of Mobulid Rays Caught In Association with Fisheries in the IOTC Area of Competence

Sea Turtles.

- Resolution 12-04 (which supersedes various prior measures) is specific to the conservation of sea turtles, and requires a range of measures including, to the extent practicable to avoid the encirclement of turtles and to safely release all turtles, including those observed entangled in FADs and to provide data on turtle bycatch to the SC. If a sea turtle is entangled in the net, the net roll should be stopped as soon as the animal comes out of the water; and the turtle should be disentangled without injuring it before resuming the net roll. Vessels are encouraged to adopt FAD designs that reduce the incidence of entanglement of marine turtles and report all incidents and the fate of the turtles following application of best-practice release measures. Guidance is also provided on the handling on sea turtles as part of the Code of Good Practices (CGP 2020).
- Resolution 19/02 calls for to the use of non-entangling FADs in purse seine fisheries and a transition to biodegradable FADs by 2022.

Sea birds.

- Resolution 12/06 is developed for longline fisheries however also requires IOTC members to provide data on interactions between fisheries and sea birds to the SC.

Cetaceans.

- Resolution 13/04 On the conservation of cetaceans

Monitoring and mitigation research

- Resolution 10/04 established a regional observer program that requires at least 5% coverage for vessels over 24 m, and for smaller vessels operating in the high seas.

National legislation –
The Shark Fisheries Management Regulations, 2015, prohibits the finning of any shark species at sea or the transhipment of fins and prohibits the catching and landing of the following species:
1. Shark species of the Family Alopidae;
    a. *Alopias vulpinus*
    b. *Alopias superciliosus*
    c. *Alopias pelagicus*
2. *Carcharhinus longimanus*
3. *Rhincodon typus*

National Plans of Action:

Sharks: NPOA sharks was first finalized in 2013 then revised in 2018 for implementation from 2018-2022.

Seabirds: Sri Lanka has determined that seabird interactions are not a problem for their fleets. However a formal review has not yet taken place which the WPEB and SC have approved.

Marine turtles: An update on the progress of the implementation of the FAO Guideline to Reduce Sea Turtle Mortality in Fishing Operation in 2019 was submitted to IOTC in March 2020. Marine turtles are legally protected in Sri Lanka and it is prohibited to catch them. Longline vessels are required to have dehookers for removal of hooks and a line cutter on board, to release the caught marine turtles. Gillnets longer than 2.5 km are now prohibited in domestic legislation and Sri Lanka are in the process of phasing out the use of gill nets within its EEZ with a view to enforcing complete prohibition of gill nets by 2022. Reporting of bycatch has made legally mandatory and facilitated via logbooks

Sri Lankan Flora and Fauna Protection Ordinance (FFPO 1948)

Fisheries and Aquatic Resources Act (FARA 1996)

Shark finning

Through the MSC interpretations log[2], the MSC has previously clarified that:

"*No systematic occurrence of shark finning is acceptable for an MSC certified fishery. MSC acknowledges that there are uncertainties associated with the methods used to verify whether shark finning is taking place, and has therefore defined various risk-based levels of acceptable confidence that shark finning is not taking place, based on different levels of information and management control … If rare and isolated cases of shark finning are encountered in the most recent year (or the recent period considered in scoring the fishery, which should be no less than the last full season of landings), the team should evaluate the nature of such cases to determine whether further cases of shark finning could be happening in the fishery in a systematic way.*" Also, "*Fisheries should not be perversely penalised, for example, for putting in place very good surveillance and enforcement systems that are proving effective and still detecting and quickly resolving the odd rare case*".

This interpretation is valid under the previous version of the MSC Fisheries Process (v.2.1 – MSC 2018b). However, under the new version of the MSC Process (v2.2 – MSC 2020), from September 25th 2020 fisheries in the MSC programme cannot include entities that have been prosecuted for a shark-finning violation in the last two years – such entities will be considered out-of-scope.

In addition, the MSC has clarified the following through the interpretations log[3]:

- *It does not matter **where** the activity that led to a conviction occurred; if an entity is convicted for a shark finning violation, the entity is out of scope.*

*The MSC's intent is that any vessel **engaged** in the practice of shark finning is to be excluded from the UoA/UoC. For fisheries in an assessment, this means that an entire UoA should not fail an assessment, and for certified fisheries it means the entire UoC should not be suspended due to the involvement of one vessel or a minority of vessels in shark finning practices.*

The FIP co-ordinator has confirmed (Steve Creech pers. comm) that no or entity that is part of the putative UoA or client has been convicted of any shark finning violation. Lending support to this conclusion are photographs taken by Local Observers of whole sharks being landed - part of the retained catch. Full utilisation of the shark is expected as shark meat has a value in Sri Lanka - dried, sold, consumed. Fins and jaws are destined for export.

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[2] https://mscportal.force.com/interpret/s/article/Shark-finning-requirements-1527262010507
[3] https://mscportal.force.com/interpret/s/article/Clarification-of-shark-finning-conviction-scope-requirements-and-the-approach-to-take-when-there-is-evidence-of-shark-finning-in-the-UoA-UoC

Update of ETP species scoring issues tables

PI 2.3.1 – ETP species outcome

PI 2.3.1	The UoA meets national and international requirements for the protection of ETP species The UoA does not hinder recovery of ETP species		
Scoring Issue	SG 60	SG 80	SG 100
a	Effects of the UoA on population/stock within national or international limits, where applicable		
	Guide post	Where national and/or international requirements set limits for ETP species, the **effects of the UoA** on the population/ stock are known and **likely** to be within these limits.	Where national and/or international requirements set limits for ETP species, the **combined effects of the MSC UoAs** on the population /stock are known and **highly likely** to be within these limits.	Where national and/or international requirements set limits for ETP species, there is a **high degree of certainty** that the **combined effects of the MSC UoAs** are within these limits.
	Met?	**NA**	**NA**	**NA**
Rationale				

There are no national and/or international requirements that set limits for the ETP species that interact with the Sri Lankan Tuna Fishery. This SI is therefore considered to be not relevant (SA3.10.1.1, MSC 2018a).

	Direct effects			
b	Guide post	Known direct effects of the UoA are likely to not **hinder recovery** of ETP species.	Direct effects of the UoA are **highly likely** to not **hinder recovery** of ETP species.	There is a **high degree of confidence** that there are no **significant detrimental direct effects** of the UoA on ETP species.
	Met?	**Yes – spinetail mobula, smoothtail mobula, Chilean devil ray, silky shark, thresher sharks, oceanic whitetip shark, common bottlenose dolphin, Olive Ridley sea turtle, loggerhead sea turtle** **No – Leatherback sea turtle (see RBF)**	**Yes - spinetail mobula, smoothtail mobula, Chilean devil ray, silky shark, thresher sharks, oceanic whitetip shark, common bottlenose dolphin** **No - Olive Ridley sea turtle, loggerhead sea turtle, Leatherback sea turtle**	**No – all ETP species**
Rationale				

ETP species are defined by the MSC (MSC 2018a) as species that are:

i) Recognised by national ETP legislation,
ii) Listed on Appendix I of CITES (unless it can be shown that the particular stock of the CITES listed species impacted by the UoA under assessment is not endangered),
iii) Listed in any binding agreements concluded under the Convention on Migratory Species (CMS), or
iv) Classified as 'out-of scope' (amphibians, reptiles, birds and mammals) that are listed in the IUCN Redlist as vulnerable (VU), endangered (EN) or critically endangered (CE).

In addition, silky shark is assessed as an ETP species alongside those listed in **Table 9**.

Despite not having stock assessments available or an accurate estimate of population size for the ETP species assessed here it is concluded that the impact of the UoA on these ETP species populations CAN be determined analytically by virtue of the extremely low level of incidence of catches. Further, taking account of MSC V2.01 GSA3.4.6 which states that *where total fishing mortality is not below F_{MSY}, teams need to evaluate whether the marginal fishing mortality caused only by the relevant MSC UoAs is material to the stock's ability to recover*; the guidance goes further illustrating the approach, *even if the total catch of a species is clearly hindering recovery, UoA catches of less than 30% of the total catch of a species may not normally be influential in hindering a recovery in a marginal sense, i.e., nothing the UoA does would be likely to change the situation.*

Mobulid rays – The overall catch for mantas and devil rays across all IOTC fisheries has been estimated at 10,480 tonne with 29 ton attributed to fresh and frozen longline fleets (Garcia & Herrera 2018). However, such estimates are subject to high uncertainty, as almost all of the manta and stingray mortality had to be estimated for their study because most fleets do not report catches of those species.

According to the LO program between 2018-2020 (Table 4) spinetail Devil Ray (*Mobula japonica*) accounted for 0.720% or 212 kg of the observed catch per annum, Smoothtail mobula (M. thurstoni) for 0.075% or 22 kg and Chilean devil ray (*M. tarapacana*) for 0.046% or 13kg of the observed catch. Raised to the total effort of the fleet this equates to an estimated 2.2. tons annually or 435 individuals for *M. japonica*; 0.3 ton or 1766 individuals for *M. thurstoni*; and 0.14 tons or 52 individuals for *M. tarapacana*.

According to the LOP Chilean devil ray were all discarded alive during the 3-years program on observed sets. The total volume of the other 2 species was retained.

There have been no assessments of Manta or Mobula populations in the IOTC area of jurisdiction. The IUCN considers that globally, based on current levels of exploitation and declining population trends, the suspected population reduction is 50–79% over the past three generation lengths (38 years), with a further population reduction suspected over the next three generation lengths (2018–2056). Sustained pressure from fishing (both directed and bycatch) has been isolated as the main cause of these declines.

Based on the relatively low number of interactions per annum (i.e. less than 30% of the total fishing mortality) and the release of all individuals of the Chilean devil ray permitting the likely survival of some of the released animals the known direct effects of the UoA are therefore highly likely to not hinder recovery, **such that SG60 and SG80 are met.**

The numbers and volumes of spinetail devil ray and smoothtail mobula per annum are likewise insignificant compared with the total estimated fishing mortality in the Indian Ocean (Garcia and Herrea estimate total mortality at 10 500 tons per annum). Despite that ALL individuals are retained in contravention of Res. 19/03, the known direct effects of the UoA are considered highly likely to not hinder recovery, **such that SG60 and SG80 are met.**

One cannot say with a high degree of confidence that the effect of the Sri Lanka tuna fleet on the population is not having a significant detrimental effect on the species, **SG100 is not met**.

Silky shark - the species accounted for 0.683% (198 kg) of the observed UoA catch on average or 442 individuals over 3 years. Scaled up to the total effort of the UoA this amounts to an estimate of 2 ton per annum or 1539 individuals. While the IOTC has expressed concern about the declining abundance of silky shark, it does not manage the species and has not carried out a stock assessment. The average 2013-2017 reported IOTC catch of silky shark is 2,967 tonnes (IOTC2018f), which is likely to be an underestimate and total estimated catches may be approximately 10 times higher than declared in the IOTC database. A study by Garcia & Herrera (2018) estimated Sri Lankan coastal longline contributes roughly 15% of the total estimated bycatch of silky shark for all IOTC fisheries combined. Based on the estimated total mortality (2,967 tonnes) the catch of silky shark by the UoA component of the Sri Lankan coastal longline fleet represents approximately 0.067% of the total fishing mortality in the Indian Ocean. At such a low level relative to the total fishing mortality the impact of the UoA can be deemed highly likely to not be hindering recovery of the species. **SG60, SG80 are met.**
Without an estimate of the total population size or stock assessment it is not possible to conclude this with a high degree of certainty - **SG100 is not met.**

Thresher sharks – the LOP reports that some thresher sharks (32) are still retained by the fishery, most are either discarded dead (39) or alive (16). The estimated total average raised annual catch of thresher sharks by the UoA is 269 individuals or 1.16 ton per annum (bigeye thresher included). Garcia and Herrera (2018) estimated the total fishing mortality of thresher sharks (all species) at greater than 37000 tons per annum. At the extremely low level of incidence in the Unit of Assessment, it can be concluded highly likely that the UoA is not causing significant detrimental direct effects on these species, **SG60, SG80 are met.** Without an estimate of the total population size or stock assessment it is not possible to conclude this with a high degree of certainty - **SG100 is not met.**

Oceanic whitetip shark – the estimated average annual volume of oceanic whitetip caught by the UoA is 0.7 ton or 766 individuals. The LOP recorded an observed 13 individuals retained, 88 discarded dead and 119 discarded alive. Garcia and Herrera (2018) estimated the total fishing mortality of oceanic whitetip at 2900 tons per annum, attributing approximately 10% of the mortality to the coastal longline fishery of Sri Lanka. At the extremely low level of incidence in the Unit of Assessment, and considering that about half the individuals are released alive, it can

be concluded highly likely that the UoA fishery is not causing significant detrimental direct effects on this species, **SG60, SG80 are met.** Without an estimate of the total population size or stock assessment it is not possible to conclude this with a high degree of certainty - **SG100 is not met.**

Common bottlenose dolphin – the LOP reported a total of 20 interactions with this species in 3 years. In all instances the dolphins were reported released alive. The estimated total average raised annual catch of bottlenose dolphins by the UoA is 70 individuals. The species is ranked as Least Concern by the IUCN and at such a relatively low level of incidence and considering the LOP reports all individuals are released alive one can conclude that the UoA is highly likely to not be hindering recovery of this species. **SG60 and SG80 are met.** Abundance of Common Bottlenose Dolphins has been estimated for several parts of the species' range. Summing available estimates, a minimum world-wide abundance estimate would be 750,000, acknowledging that most of the range of the species has not been surveyed for abundance estimation, and some of the estimates included in the summation are out of date. Without a stock assessment it is not possible to conclude this with a high degree of certainty that the UoA is not hindering recovery of the species - **SG100 is not met.**

Sea turtles – the fishery LOP reported interactions with leatherback, loggerhead and olive Ridley turtles. Weight estimates vary significantly but numbers of individuals is also reported as well as fate. The LOP reported a total of 43 leatherback turtles over 3 years with 28 discarded dead and 13 discarded alive; 13 loggerhead turtles and 256 Olive Ridley turtles all of which were reported discarded alive.

The status of the global population of a marine turtle species in a given ocean region does not always reflect the real status of some of its subpopulations. Marine turtle subpopulations may vary widely in population size, geographic range and population trends, which makes it necessary to study marine turtles at a subpopulation level (Justel and Restrepo 2015). Wallace et al 2010 scored turtle population risk levels according to regional management units (RMU) and found that the Northeast Indian Ocean included RMUs for Olive Ridley and loggerhead turtles that ranked in the top eleven of the worlds most endangered RMUs and that in the area generally RMUs were classified as High Risk with High Threat status.

An ERA conducted by Nel et al (2013) showed longliners are responsible for an estimated 10% of turtle interactions in the Indian Ocean and that the susceptibility of turtles to gear is a product of the Regional Management Unit total area and the longline threat ranked as 1 (low) throughout all RMUs excepting for lethaerback and loggerhead turtles in the SWIO and Bay of Bengal.

According to Garcia and Herrera (2018) a total of 24 620 olive ridley, 1412 loggerhead and 1051 leatherback turtles are caught each year in the Indian Ocean. When LOP recorded interactions are raised to the total estimated fishing effort for the UoA annually the UoA is estimated to catch 892 Olive Ridley (4%), 45 loggerhead (3%) and 150 leatherback (14%) of each species in the Indian Ocean annually. The LOP reports that all Olive Ridley and loggerhead turtles were released alive but that 65% of leatherback turtles were discarded dead.

For Olive Ridley and loggerhead turtles one can conclude that at the low level of incidence and considering live release of all individuals that the UoA is likely not to hinder recovery of those species. **SG60 is met for these two species.**

Without better estimates of the number of interactions, the fate/post-capture mortality of each individual and without accurate estimates of population size or a stock assessment one cannot conclude that the fishery is highly likely not hindering recovery of the two species - **SG80 and SG100 are not met.**

For the leatherback turtle the Sri Lankan longline fishery is estimated to be responsible for approximately 14% of catches in the Indian Ocean annually and the reported high level of mortality in the UoA suggests that the impact of the UoA is not insignificant and therefore one cannot conclude that the fishery is not likely hindering recovery of the species. Until more information is available on the exact number of interactions and without information on post-capture mortality it is recommended to score this species using the RBF.

	Indirect effects			
c	Guide post		Indirect effects have been considered for the UoA and are thought to be **highly likely** to not create unacceptable impacts.	There is a **high degree of confidence** that there are no **significant detrimental indirect effects** of the UoA on ETP species.
	Met?		**No**	**No**
Rationale				

Potential indirect effects may include reduced availability of prey items for ETP species due to their removal by the UoA; disturbance of nesting behaviour for sea turtles; perturbation of pelagic ecosystem balance. More information on each of these possible indirect effects should be collected to inform scoring of this issue. Until then it cannot be concluded that indirect effects are highly likely to not create unacceptable impacts. **SG80 is not met.**

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Overall Performance Indicator (PI) Rationale

Despite not having stock assessments available or an accurate estimate of population size for the ETP species assessed here it is concluded that the impact of the UoA on these ETP species populations CAN be determined analytically by virtue of the extremely low level of incidence of catches.

Information collected through the Local Observer Program can be used, in combination with commercial logbooks and offload monitoring, to estimate the total impact of the UoA on ETP species. This supports quantitative analysis to assess the UoA related mortality and impact and to determine whether the UoA may be a threat to protection and recovery of the ETP species.

Based on the relatively low impact of the UoA compared to the total impact of all fisheries in the Indian Ocean it can be concluded highly likely that the UoA is not causing significant detrimental direct effects on mobulids, silky shark, thresher sharks, oceanic whitetip shark and bottlenose dolphins. However, without an estimate of the total population size or stock assessment for those species it is not possible to conclude this with a high degree of certainty. For sea turtles, the local populations or Regional Management Units in the area of the fishery are assessed as "High Risk" and "High Threat" but all Olive Ridley and Loggerhead turtles are reportedly released alive thus the impact of the fishery is considered likely not to hinder recovery of those two species. For the Leatherback turtle the LOP reports the majority of individuals are discarded dead, as such the impact of the fishery cannot be deemed as insignificant, as such it is recommend to assess the species using the RBF.

Draft scoring range	**60-79 – Olive Ridley sea turtle, loggerhead sea turtle** **>80 - All other ETP species**
Information gap indicator	**More information sought relating to the total fishing effort and catches of the UoA.** **Clarification on weight estimation procedure of retained/discarded species.** **Clarification on ETP species reporting procedures – observer sub-sampling strategy AND commercial catch statistics reporting AND offload monitoring**
Data-deficient? (Risk-Based Framework needed)	**Yes – Leatherback turtle, however preliminary RBF scores are presented for all ETP species for consideration.**

PI 2.3.2 – ETP species management strategy

PI 2.3.2	The UoA has in place precautionary management strategies designed to: - meet national and international requirements; - ensure the UoA does not hinder recovery of ETP species. Also, the UoA regularly reviews and implements measures, as appropriate, to minimise the mortality of ETP species		
Scoring Issue	SG 60	SG 80	SG 100
	Management strategy in place (national and international requirements)		
a Guide post	There are **measures** in place that minimise the UoA-related mortality of ETP species, and are expected to be **highly likely to achieve** national and international requirements for the protection of ETP species.	There is a **strategy** in place for managing the UoA's impact on ETP species, including measures to minimise mortality, which is designed to be **highly likely to achieve** national and international requirements for the protection of ETP species.	There is a **comprehensive strategy** in place for managing the UoA's impact on ETP species, including measures to minimise mortality, which is designed to **achieve above** national and international requirements for the protection of ETP species.
Met?	**NA**	**NA**	**NA**
Rationale			

As SIb is scored, SIa is not scored, here (SA 3.11.2, MSC 2018a).

	Management strategy in place (alternative)		
b Guide post	There are **measures** in place that are expected to ensure the UoA does not hinder the recovery of ETP species.	There is a **strategy** in place that is expected to ensure the UoA does not hinder the recovery of ETP species.	There is a **comprehensive strategy** in place for managing ETP species, to ensure the UoA does not hinder the recovery of ETP species.
Met?	**Yes - All ETP species**	**No - All ETP species**	**No - All ETP species**
Rationale			

ETP species considered include silky shark, thresher sharks, devil rays and mobulid rays, oceanic whitetip shark, common dolphin and sea turtles. In the previous pre-assessment for this fishery hammerhead sharks (particularly scalloped hammerhead) and short fin mako were prominent in the catches but are absent from LOP records.

Giant manta rays and Mobula species – These species are the focus of IOTC Resolution 19/03 On the Conservation of Mobulid Rays caught in association with Fisheries in the IOTC Area of Competence. This was adopted at the twenty-third session of the IOTC in 2019.

Resolution 19/03 prohibits intentional setting on mobulid rays as well as retaining onboard, transhipping, landing or storing any part or whole carcass. Live release handling procedures are detailed in the resolution.

Oceanic whitetip shark, bigeye thresher shark, hammerhead sharks, shortfin mako, silky shark – Various IOTC Resolutions are focused on the management of shark species, and on oceanic whitetip shark specifically.

- Resolution 13/06 on a scientific and management framework on the conservation of shark species caught in association with IOTC managed fisheries, prohibits retention onboard, transhipping, landing or storing any part or whole carcass of oceanic whitetip sharks.

- Resolution 13/05 on the conservation of whale sharks (R*hincodon typus*) prohibits the intentional setting of purse seine nets around whale sharks if it was spotted prior to the net being deployed.

- Resolution 17/05 established that CPCs shall take the necessary measures to require that their fishermen fully utilize their entire catches of sharks, with the exception of species prohibited by the IOTC.

- Resolution 12/09 prohibits the retention on board of all species of thresher sharks, a group that is thought to be particularly vulnerable due to its low productivity.

Sea Turtles – Turtle species are the focus of Resolution 12/04 (which supersedes various prior measures), requiring IOTC members to mitigate sea turtle mortality and to provide data on turtle bycatch to the SC. The measure has specific requirements for longline and purse seine operators to facilitate the appropriate handling and release of live turtles.

National legislation –
The Shark Fisheries Management Regulations, 2015, prohibits the finning of any shark species at sea or the transhipment of fins and prohibits the catching and landing of the following species:
    4. Shark species of the Family Alopidae;
        a. *Alopias vulpinus*
        b. *Alopias superciliosus*
        c. *Alopias pelagicus*
    5. *Carcharhinus longmanus*
    6. *Rhincodon typus*

National Plans of Action:

Sharks: NPOA sharks was first finalized in 2013 then revised in 2018 for implementation from 2018-2022.

Marine turtles: An update on the progress of the implementation of the FAO Guideline to Reduce Sea Turtle Mortality in Fishing Operation in 2019 was submitted to IOTC in March 2020. Marine turtles are legally protected in Sri Lanka and it is prohibited to catch them.

Longline vessels are required to have dehookers for removal of hooks and a line cutter on board, to release the caught marine turtles. Reporting of bycatch has been made legally mandatory and facilitated via logbooks.

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)

Scientific Name / Common Name	FFPO	FARA
Class : Reptilia (Reptiles)		
Family : Crocodylidae		
Crocodylus palustris – Mugger / Marsh crocodile	X	
Crocodylus porosus – Saltwater / Estuarine crocodile	X	
Family : Cheloniidae		
Caretta caretta - Loggerhead sea turtle	X	
Chelonia mydas - Green turtle	X	
Eretmochelys imbricata - Hawksbill sea turtle	X	
Lepidochelys olivacea - Oliver ridley sea turtle	X	
Family : Dermochelyidae		
Dermochelys coriacea - Leatherback sea turtle	X	
Class Elasmobranchii (Sharks)		
Family - Carcharhinidae		
Carcharhinus longimanus - Oceanic whitetip shark		X
Family - Alopiidae		
Alopias pelagicus - Pelagic thresher		X
Alopias superciliosus - Bigeye thresher		X
Alopias vulpinus - Thintail thresher		X
Family - Rhincodontidae		
Rhincodon typus - Whale shark		X

Overall, the abovementioned measures require the collection and reporting on information on each of the species groups and the UoA has in place the Local Observer Program to monitor a small portion of the vessels are adhering to those requirements through use of at-sea observers/crew by recording all catch from 3 sets per trip. In addition, the fleet submits catch returns and annual implementation reports to the IOTC. The measures in place, including both IOTC regional Resolutions as well as Sri Lankan National Regulations, are expected to ensure the UoA does not hinder the recovery of ETP species. **SG60 is met.**

Measures in place are not expected to be highly likely to ensure the UoA does not hinder the recovery of ETP species. **SG80 is not met.**

A "comprehensive strategy" is defined as a complete and tested strategy made up of linked monitoring, analyses, and management measures and responses. **SG100 is not met.**

		Management strategy evaluation		
c	Guide post	The measures are **considered likely** to work, based on **plausible argument** (e.g., general experience, theory or comparison with similar fisheries/species).	There is an **objective basis for confidence** that the measures/strategy will work, based on **information** directly about the fishery and/or the species involved.	The strategy/comprehensive strategy is mainly based on information directly about the fishery and/or species involved, and a **quantitative analysis** supports **high confidence** that the strategy will work.
	Met?	**Yes**	**No**	**No**
Rationale				

NPOAs are a framework that facilitate estimation of shark catches, turtle interactions and release procedures and development and implementation of appropriate management measures, which should also enhance the collection of bycatch data and compliance with IOTC Resolutions. NPOA for sharks and sea turtles bolstered by specific regulations can be considered likely to work based on plausible argument (i.e. they have been developed specifically to draw attention to and resolve the issue). **SG60 is met.**

Issues identified (and ranked) in the NPOA – Sharks include but are not limited to the following social and economic issues:
- Loss of employment to fishers engaged in directed coastal thresher shark fishing due to the ban (High)
- Negative impact of the thresher shark ban on the production of and trade in dry fish thus affecting those involved in those activities (Medium)
- Loss of income to fin traders due to decline of demand for shark fins in the international market and ban on thresher shark (Medium)
- **Lack of compliance by the fishers with current regulations on sharks and protection of critical habitats (High)**
- Inadequacy of awareness programs conducted on regulations for fishing communities (High)
- **Lack of knowledge on the importance and need for conservation and management of shark resources among the fishermen (High)**
- Difficulties experienced in releasing live of specimens of the prohibited species (thresher sharks) caught incidentally (Medium)
- Misidentification and under-reporting of shark catches (High)
- **Absence of an onboard observer scheme for validation of data (High)**
- Absence of data collection scheme for shark species caught in the coastal waters (Medium)
- Lack of data on shark products (High)
- Inadequate consultation with stakeholders prior to the introduction of the ban on catching thresher sharks (High)

There is no clear indication of the use of dehookers or any information with respect to post-capture mortality of sea turtles. Data collected through the Local Observer Program (LOP) is beginning to resolve the issue of at sea data validation and is a significant step towards resolving two other significant issues (highlighted bold above) as observers are recognised as a tool to generally improve compliance with Regulations (both through presence and interpretation of the rules) and are an effective medium for imparting knowledge to fishermen about updated regulations or conservation measures (such as safe handling and release procedures).

Initial findings of the LOP show good uptake and collaboration with fishers in ports and with vessels where it has been activated. Unfortunately there are clear incidences in the fishery indicating that certain Conservation and Management Measures are not being adhered to (specifically Res. 19-03 on Mobulids). This speaks to the ongoing need to expand observer coverage and communication of CMMs to the fleet to resolve some of the high priority issues identified by the NPOA sharks. **SG80 is not met.**

	Management strategy implementation			
d	Guide post		There is some **evidence** that the measures/strategy is being implemented successfully.	There is **clear evidence** that the strategy/comprehensive strategy is being implemented successfully and **is achieving its objective as set out in scoring issue (a) or (b).**
	Met?		**Yes – oceanic whitetip, sea turtles, thresher sharks, common bottlenose dolphin** **No - smoothtail mobula, spinetail mobula, silky shark**	**No – all ETP species**
Rationale				

There is no evidence of vessels in the UoA landing or retaining oceanic whitetip sharks, thresher sharks, sea turtles or common bottlenose dolphins. **SG80 is met for these species.**

There is no evidence that the UoA fleet has adopted best-practice release procedures. It is clear that Resolution 19/03 on the Conservation of Mobulid Rays is not being adhered to by the fleet as spinetail mobula and smoothtail mobula are retained by the fishery. **SG80 is not met for these species**.

Silky shark (although not officially protected by either the IOTC of Sri Lankan national legislation) is recognised by other MSC UoAs that are certified in the Indian Ocean as an ETP species. It is therefore advisable that the UoA under assessment here take the precautionary

approach and harmonise with those other fisheries and treat silky shark as an ETP species. In such a case the retention of the species should be prohibited (as is the case with thresher sharks and oceanic whitetip). The UoA clearly considers silky shark as valuable bycatch species and retains all large sharks while discarding (dead or alive) small sharks. Until all are released or discarded **SG80 is not met**.

e		Review of alternative measures to minimize mortality of ETP species		
	Guide post	There is a review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of ETP species.	There is a **regular** review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of ETP species and they are implemented as appropriate.	There is a **biennial** review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality ETP species, and they are implemented, as appropriate.
	Met?	**Yes**	**No**	**No**
Rationale				

SA3.5.3.1 "Alternative measures" in scoring issue (e) shall be interpreted by the team as alternative fishing gear and/or practices that have been shown to minimise the rate of incidental mortality of the species or species type to the lowest achievable levels.

The principle management measures applied to the fishery are determined by the IOTC, they are reviewed and revised as necessary but with no specific regularity. National Plans of Action are/should be reviewed every 5 years.

Alternative measures may be considered in this context as "practices" applied by the fishery to minimise mortality of ETP species. In this instance the practice of deploying local observers on board vessels is relevant. The associated training, education and communication programs associated with deployment of these trained personnel also greatly contribute to minimising mortality of ETP species more broadly in the fleet as the program spreads to more vessels and harbours. **SG60 is met**.

It is not clear that the intent of the LOP is specifically to consider reduction of ETP species mortality notr with what frequency measures and NPOAs are being reviewed. **SG80 is not met.**

Overall Performance Indicator (PI) Rationale

Data collected through the Local Observer Program (LOP) is beginning to resolve the issue of at sea data validation and is a significant step towards resolving other significant issues related to lack of fisher compliance with reporting and lack of knowledge with compliance and management measures.

There is no evidence that the UoA fleet has adopted best-practice release procedures. It is clear that Resolution 19/03 on the Conservation of Mobulid Rays is not being adhered to by the fleet as spinetail mobula and smoothtail mobula are retained by the fishery – this kind of disregard for IOTC CMMs could lead to a score of <60 under full assessment and may be interpreted as indicative of general non-compliance. Likewise the retention f silky shark could impact the scoring of the fishery at full assessment stage.

There are National Plans of Action in place for sharks and turtles and there is legislation in place for other ETP species. Further development and application of "measures" to reduce the fishery impact/mortality of ETP species would contribute to an improved score. Overall, the abovementioned measures require the collection and reporting on information on each of the species groups and the UoA has in place the Local Observer Program to monitor a small portion of the vessels are adhering to those requirements through use of at-sea observers/crew by recording all catch from 3 sets per trip. In addition, the fleet submits catch returns and annual implementation reports to the IOTC. The measures in place, including both IOTC regional Resolutions as well as Sri Lankan National Regulations, are expected to ensure the UoA does not hinder the recovery of ETP species.

Draft scoring range	60-79
Information gap indicator	**Information sufficient to score PI**

PI 2.3.3	Relevant information is collected to support the management of UoA impacts on ETP species, including:
	- Information for the development of the management strategy;
	- Information to assess the effectiveness of the management strategy; and
	- Information to determine the outcome status of ETP species

Scoring Issue		SG 60	SG 80	SG 100
a		Information adequacy for assessment of impacts		
	Guide post	Qualitative information is **adequate to estimate** the UoA related mortality on ETP species. **OR** **If RBF is used to score PI 2.3.1 for the UoA:** Qualitative information is **adequate to estimate productivity and susceptibility** attributes for ETP species.	Some quantitative information is **adequate to assess** the UoA related mortality and impact and to determine whether the UoA may be a threat to protection and recovery of the ETP species. **OR** **If RBF is used to score PI 2.3.1 for the UoA:** Some quantitative information is **adequate to assess productivity and susceptibility attributes** for ETP species.	Quantitative information is available to assess with a high degree of certainty the **magnitude of UoA-related impacts, mortalities and injuries and the consequences for the status** of ETP species.
	Met?	**Yes**	**No**	**No**
Rationale				

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. LOs also take pictures of the catch for analysis on land.

Spatial and temporal data are 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) is extracted from the Local Observer Trip Record Book.

A rough extrapolation of quantitative data from the LOP can be made to estimate the UoA related mortality of ETP species. **SG60 is met.**

However this is based on generic estimates of number of trips, number of hooks set and does not taken into account seasonality, fishing areas, variability of vessel fishing strategy etc. and is based on a low proportion of observed trips. One cannot say therefore that the quantitative information is "adequate to assess" the UoA related mortality and impact and to determine whether the UoA may be a threat to protection and recovery of the ETP species. **SG80 is not met.**

b		Information adequacy for management strategy		
	Guide post	Information is adequate to support **measures** to manage the impacts on ETP species.	Information is adequate to measure trends and support a **strategy** to manage impacts on ETP species.	Information is adequate to support a **comprehensive strategy** to manage impacts, minimize mortality and injury of ETP species, and evaluate with a **high degree of certainty** whether a strategy is achieving its objectives.
	Met?	**Yes**	**No**	**No**
Rationale				

A greater degree of confidence can be attributed to ETP species reporting as it is derived from a defensible and verifiable at-sea observer program. This in turn leads to more reliable commercial catch statistics reporting. Observers record the fate of each ETP species individual caught by the vessel (retained, discarded dead/alive) and estimate weight for each individual. The information from the LOP informs managers on the number of interactions, the behaviour of the crew and the application of release procedures and provides some indication of the fate of the released individuals. This together is adequate to support measures to manage the impacts on ETP species. **SG60 is met.**

A "strategy" represents a cohesive and strategic arrangement which may comprise one or more measures, an understanding of how it/they work to achieve an outcome and which should be designed to manage impact on that component specifically. A strategy needs to be appropriate to the scale, intensity and cultural context of the fishery and should contain mechanisms for the modification fishing practices in the light of the identification of unacceptable impacts. (Table SA 8 of the Standard MSC V2.01).

More information is required on post-release survival of ETP species (currently information is to coarse dead/alive). Information is also not yet considered adequate to measure trends in impact of the UoA n ETP species populations. There is simply a single measure in place – the collection of information – without other mechanisms derived from the information that would be applied

to the fishery one cannot say that there is a strategy to manage impacts on ETP species not enough information yet to support one. **SG80 is not met.**

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) <u>for a given set.</u> LOs also take pictures of the catch for analysis on land. The outcome (fate) for each fish or other captured species (i.e. retained or discarded dead or alive) is extracted from the Local Observer Trip Record Book. A rough extrapolation of quantitative data from the LOP can be made to estimate the UoA related mortality of ETP species. However this is based on generic estimates of number of trips, number of hooks set and does not taken into account seasonality, fishing areas, variability of vessel fishing strategy etc. and is based on a low proportion of observed trips. The information from the LOP informs managers on the number of interactions, the behaviour of the crew and the application of release procedures and provides some indication of the fate of the released individuals. Expansion of the LOP to include more vessels within the UoA and all harbours where the UoA vessels land their catch would support increased scoring.

Draft scoring range	60-79
Information gap indicator	**Information sufficient to score PI**

Indicative scoring for PI 3.2.2

Component	Fishery- specific management system		
PI 3.2.2 Decision-making processes	The fishery-specific management system includes effective decision-making processes that result in measures and strategies to achieve the objectives and has an appropriate approach to actual disputes in the fishery.		
Scoring issues	**SG60**	**SG80**	**SG100**
(a) Decision-making processes	There are **some** decision-making processes in place that result in measures and strategies to achieve the fishery-specific objectives.	There are **established** decision-making processes that result in measures and strategies to achieve the fishery-specific objectives.	
(b) Responsive-ness of decision-making processes	Decision-making processes respond to **serious issues** identified in relevant research, monitoring, evaluation and consultation, in a transparent, timely and adaptive manner and take some account of the wider implications of decisions.	Decision-making processes respond to **serious and other important issues** identified in relevant research, monitoring, evaluation and consultation, in a transparent, timely and adaptive manner and take account of the wider implications of decisions.	Decision-making processes respond to **all issues** identified in relevant research, monitoring, evaluation and consultation, in a transparent, timely and adaptive manner and take account of the wider implications of decisions.
(c) Use of precautionary approach		Decision-making processes use the precautionary approach and are based on best available information.	
(d) Account-ability and transparency of management system and decision making process	Some information on the fishery's performance and management action is generally available on request to stakeholders	**Information on the fishery's performance and management action is available on request,** and explanations are provided for any actions or lack of action associated with findings and relevant recommendations emerging from research, monitoring evaluation and review activity.	Formal reporting to all interested stakeholders **provides comprehensive information on the fishery's performance and management actions** and describes how the management system responded to findings and relevant recommendations emerging from research, monitoring, evaluation and review activity.
(e) Approach to disputes	Although the management authority or fishery may be subject to continuing court challenges, it is not indicating a disrespect or defiance of the law by repeatedly violating the same law or regulation necessary for the sustainability for the	The management system or fishery is attempting to comply in a timely fashion with judicial decisions arising from any legal challenges.	The management system or fishery acts proactively to avoid legal disputes or rapidly implements judicial decisions arising from legal challenges.

Component	Fishery- specific management system		
PI 3.2.2 Decision-making processes	The fishery-specific management system includes effective decision-making processes that result in measures and strategies to achieve the objectives and has an appropriate approach to actual disputes in the fishery.		
Scoring issues	**SG60**	**SG80**	**SG100**
	fishery		
Likely Scoring Level (pass/pass with condition/fail)			**(75) Pass with condition**

Productivity Susceptibility Analysis (PSA) for ETP species using the MSC Risk-Based Framework

Scoring element	Family name	Scientific name	Common name	Species type	Productivity Scores [1-3]									Susceptibility Scores [1-3]								
					Average age at maturity	Average max age	Fecundity	Average max size	Average size at maturity	Reproductive strategy	Trophic level	Density dependance	Total Productivity (average)	Availability	Encounterability	Selectivity	Post-capture mortality	Total (multiplicative)	PSA Score	MSC PSA-derived score	Risk Category Name	MSC scoring guidepost
1	Carcharhinidae	*Carcharhinus falciformis*	Silky shark	Vertebrate	2	2	3	3	3	3	3		2.71	1	3	2	3	1.43	3.07	65	Med	60-79
2	Carcharhinidae	*Carcharhinus longimanus*	Oceanic whitetip shark	Vertebrate	2	2	3	3	2	3	3		2.57	1	3	2	2	1.28	2.87	72	Med	60-79
3	Alopiidae	*Alopias superciliosus*	Bigeye thresher shark	Vertebrate	2	2	3	3	3	3	3		2.71	1	3	2	2	1.28	3.00	67	Med	60-79
4	Mobulidae	*Mobula japanica*	Spinetail Devil Ray	Vertebrate	2	2	3	3	3	3	3		2.71	1	3	3	3	1.65	3.18	60	Med	60-79
5	Mobulidae	*Mobula mobular*	Devil fish	Vertebrate																		
6	Mobulidae	*Mobula thurstoni*	Smoothtail mobula	Vertebrate																		
7	Mobulidae	*Mobula tarapacana*	Chilean devil ray	Vertebrate																		
8	Dermochelyidae	*Dermochelys coriacea*	Leatherback turtle	Vertebrate	2	3	3	3	2	2	2		2.43	1	3	2	2	1.28	2.74	77	Med	60-79
9	Cheloniidae	*Lepidochelys olivacea*	Olive Ridley turtle	Vertebrate	2	3	2	1	2	2	3		2.14	2	3	2	1	1.28	2.49	84	Low	≥80
10	Cheloniidae	*Caretta caretta*	Loggerhead turtle	Vertebrate	3	3	3	2	2	2	3		2.57	2	3	2	1	1.28	2.87	72	Med	60-79
11	Delphinidae	*Tursiops truncatus*	Common bottlenose	Vertebrate	2	3	3	3	3	3	3		2.86	1	2	2	1	1.08	3.05	65	Med	60-79

Figure 1: Semi-industrial (<24m) Sri Lankan longline tuna vessel (photo credit Steve Creech).

Figure 2: Industrial (>24m) Sri Lankan flagged Large Scale Tuna Longline Fishing Vessel (Image credit Steve Creech).