Achieving national and international marine resource management and conservation goals within and beyond Sri Lanka's exclusive economic zone by 2030

Dehooking and live release of protected species in Sri Lanka's longline fishery

Sub project implemented by

pelagikos pvt ltd

On behalf of

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Objective

To get an idea to prepare most relevant tool kit for safe handling and live release of protected species in longline fishery.

Crew-based observer program- methodology

- Trip data, set data and catch data from the three sets of trip by using camera and the flip board
- Information of protected species caught and released in all the sets of the fishing trip
  - Name of the protected species
  - Outcome
  - Dehooked or not dehooked?
  - Onboard dehooking or dehooked in the water?
  - What are the equipment used?
  - One each video of live releasing of dolphin, turtle and shark
  - What are the improvements need to be have for the equipment?

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Guidelines and equipment for dehooking and live release of protected species in Sri Lanka's longline tuna fishery
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Crew-based observer program

Vessel No.	Skipper name	Training		Departure	Arrival	Total days	Fishing days	*Observed days*
IMULA 0737NBO	W.N.S.T Fernando	20.10.2021	D1	20.10.2021	07.12.2021	49	12	3
			D2	17.12.2021	07.02.2022	53	11	3
IMULA 0713NBO	W.N. C. Fernando	24.10.2021	D1	20.10.2021	07.12.2021	34	10	3
			D2	15.01.2022	16.02.2022	34	12	7
IMULA 0949 CHW	S. Pushpakumara	13.11.2021	D1	15.11.2021	05.01.2022	51	11	3
			D2	23.01.2022	13.03.2022	49	12	4
IMULA 0822 CHW	W.M.S.P. Fernando	15.11.2021	D1	15.11.2021	10.01.2022	56	12	5
			D2	02.02.2022	08.03.2022	35	12	7
IMULA 0728 NB0	H.W.N.M. Kumara	24.11.2021	D1	25.11.2021	21.01.2022	56	10	3
			D2	22.02.2022	18.04.2022	56	12	3
IMULA 0748 CHW	R. Fernanado	26.11.2021	D1	28.11.2021	31.12.2021	33	12	3
			D2	19.01.2022	25.02.2022	38	12	4
IMULA 0745 CHW	P.P Sudesh	27.11.2021	D1	28.11.2021	13.01.2022	46	12	2
			D2	30.01.2022	20.03.2022	51	12	4
IMULA 0762 CHW	W.A.S.J Pushpakumara	30.11.2021	D1	30.11.2021	19.01.2022	50	11	3
			D2	17.03.2022	28.04.2022	43	9	2
						734	**182**	**59**

Crew-based observer program – skipper information

Variables

1. Name
2. Skipper ID No
3. Age and experience
4. Nationality
5. Address
6. Contact No.
7. Name of the boat owner
8. Address of the boat owner
9. Contact No.

Number of trips	Skipper information		
	Total	Achieved	%
16	144	144	100%

Crew-based observer program – vessel information

Variables

1. Vessel name
2. National Reg. No
3. IOTC reg.no
4. Radio call sign No.
5. Vessel type
6. No. Crew
7. EEZ No.
8. High seas No.
9. Gross tonnage
10. Overall length (m)
11. Fish storage capacity (m^3)
12. Blast freezer capacity (m^3)
13. Refrigeration method
14. Fish storage method
15. Acoustic equipment
16. Communication
17. VMS
18. Radars
20. Plotters
21. AIS buoys
22. CCTV systems

Number of trips	Vessel Information		
	Total	Achieved	%
16	352	352	100%

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Crew-based observer program – trip details

Variables

1. Departure date
2. Arrival date
3. Departure harbor
4. Arrived harbor
5. Date start fishing
6. Date end fishing
7. Total time lost
8. Total No. operation sets
9. No. observed sets

Number of trips	Trip details		
	Total	Achieved	%
16	144	144	100%

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Crew-based observer program – gear details

Longline	
1. Mainline length	Average - 81.75 km / 50 miles (56 -112 km / 34 -69 miles)
2. Float line length	22 m / 12 Bamba
3. Branch line length	42.5 m / 23 Bamba
4. Depth set	63.9 m / 34.9 Bamba
5. No. baskets	234.3
6. Hooks per baskets	6.9 (7)
7. Total No. hooks	1622.7
8. Hook type and size	Circle hook
9. Main line material	Monofilament
10. Bait sp.	Squids
11. Bait info	Artificial
12. Dye color	No
13. Hooked (Single/ Double)	Single

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Crew-based observer program – catch and effort data

Vessel No.	No. days		Effort		Set and hauling points			Catch data		
	Total days	Fishing days	No. Hooks	Total Effort	Total	Achieved	%	Total	Achieved	%
IMUL-A-0737 NBO	12	3	2,100	6,300	6	6	100%	26	29	112%
IMUL-A-0737 NBO 2	11	3	2,000	6,000	6	6	100%	10	37	370%
IMUL-A-0713 NBO	10	3	1,364	4,092	6	6	100%	39	44	113%
IMUL-A-0713 NBO 2	12	7	1,300	9,100	14	14	100%	55	38	69%
IMUL-A-0949 CHW	11	3	1,850	5,550	6	6	100%		38	
IMUL-A-0949 CHW 2	12	4	1,950	7,800	8	7	88%		60	
IMUL-A-0822 CHW	12	5	1,500	7,500	10	9	90%	61	63	103%
IMUL-A-0822 CHW 2	12	7	1,000	7,000	14	14	100%		66	
IMUL-A-0728 NBO	10	3	2,000	6,000	6	6	100%	73	34	47%
IMUL-A-0728 NBO 2	12	3	2,000	6,000	6	5	83%	100	58	58%
IMUL-A-0748 CHW	12	3	1,200	3,600	6	6	100%	23	19	83%
IMUL-A-0748 CHW 2	12	4	1,500	6,000	8	8	100%	14	22	157%
IMUL-A-0745 CHW	12	2	1,000	2,000	4	4	100%		29	
IMUL-A-0745 CHW 2	12	4	1,000	4,000	8	6	75%	12	23	192%
IMUL-A-0762 CHW	11	3	2,200	6,600	6	6	100%	77	76	99%
IMUL-A-0762 CHW 2	9	2	2,000	4,000	4	4	100%	12	23	192%
	182	**59**	**25,964**	**91,542**	**118**	**113**	**96%**	**490**	**636**	**130%**

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Crew-based observer program – scientific data

Scientific Data	Target	Achieved	%
Set No	675	675	100%
Fish No.	675	675	100%
Local Name	675	675	100%
English name	675	675	100%
IOTC code	675	675	100%
Outcome (R/RA/RD)	675	675	100%
Weight(kg)	675	663	98%
Folk Length(cm)	675	589	87%
Date / Time	675	617	91%
Location (Lat/Long)	675	569	84%
	5400	**5138**	**95%**

Crew-based observer program – Catch and CPUE Data

Species	Number			Weight (kg)		
	n	%	CPUE	Kg	%	CPUE
Yellowfin tuna	**518**	**76.7%**	**5.7**	**21,179**	**88.7%**	**233.9**
Other capture species	**151**	**22.4%**	**1.6**	**2,696**	**11.3%**	**29.5**
Protected species	**6**	**0.9%**	**0.1**			
Common Bottlenose Dolphin	3	0.4%	0.0	-	0.0%	0.0
Leatherback sea turtle	1	0.1%	0.0	-	0.0%	0.0
Oceanic whitetip shark	1	0.1%	0.0	-	0.0%	0.0
Olive ridley	1	0.1%	0.0	10	0.0%	0.1
Total	**675**			**23,885**		

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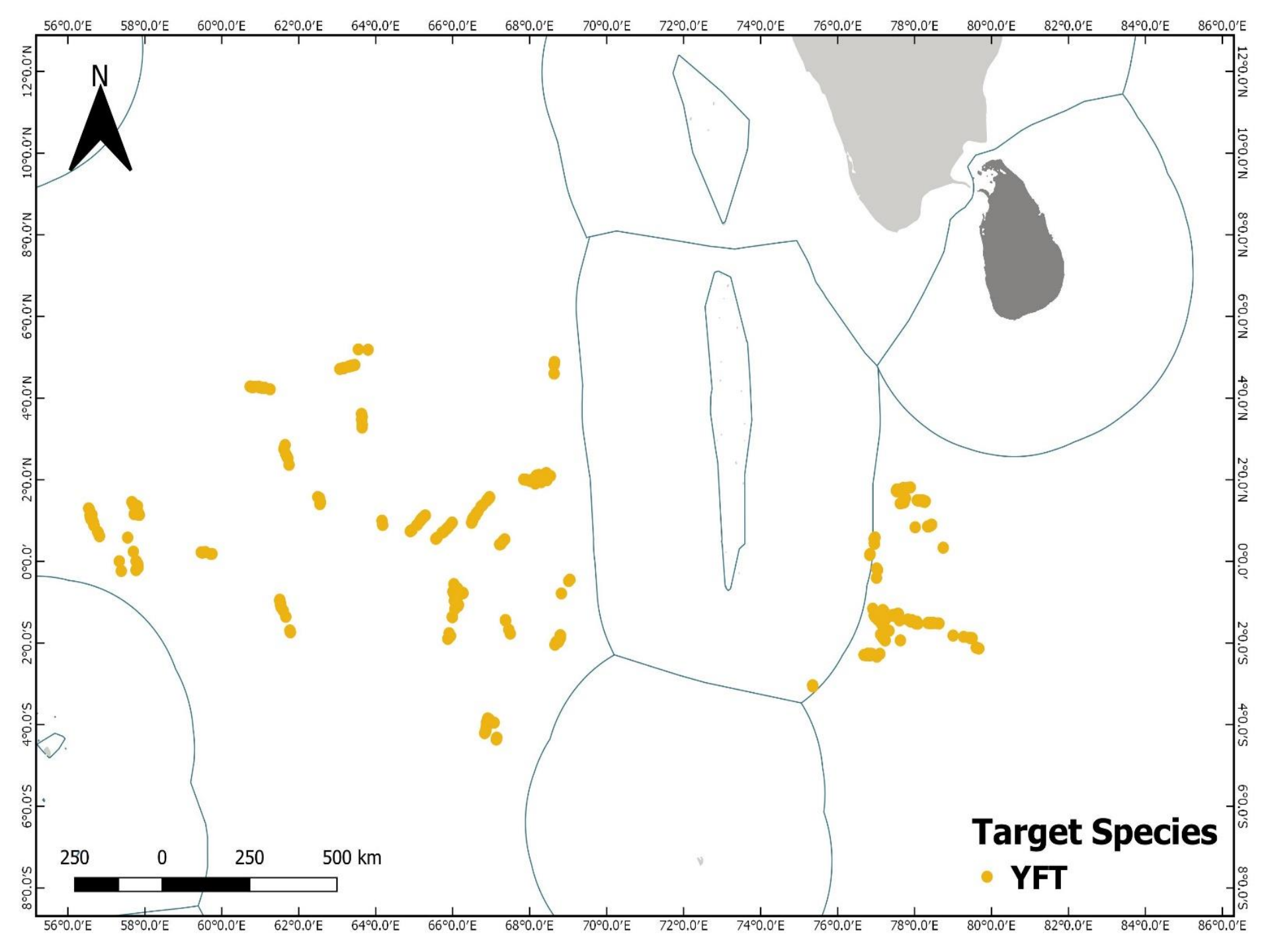
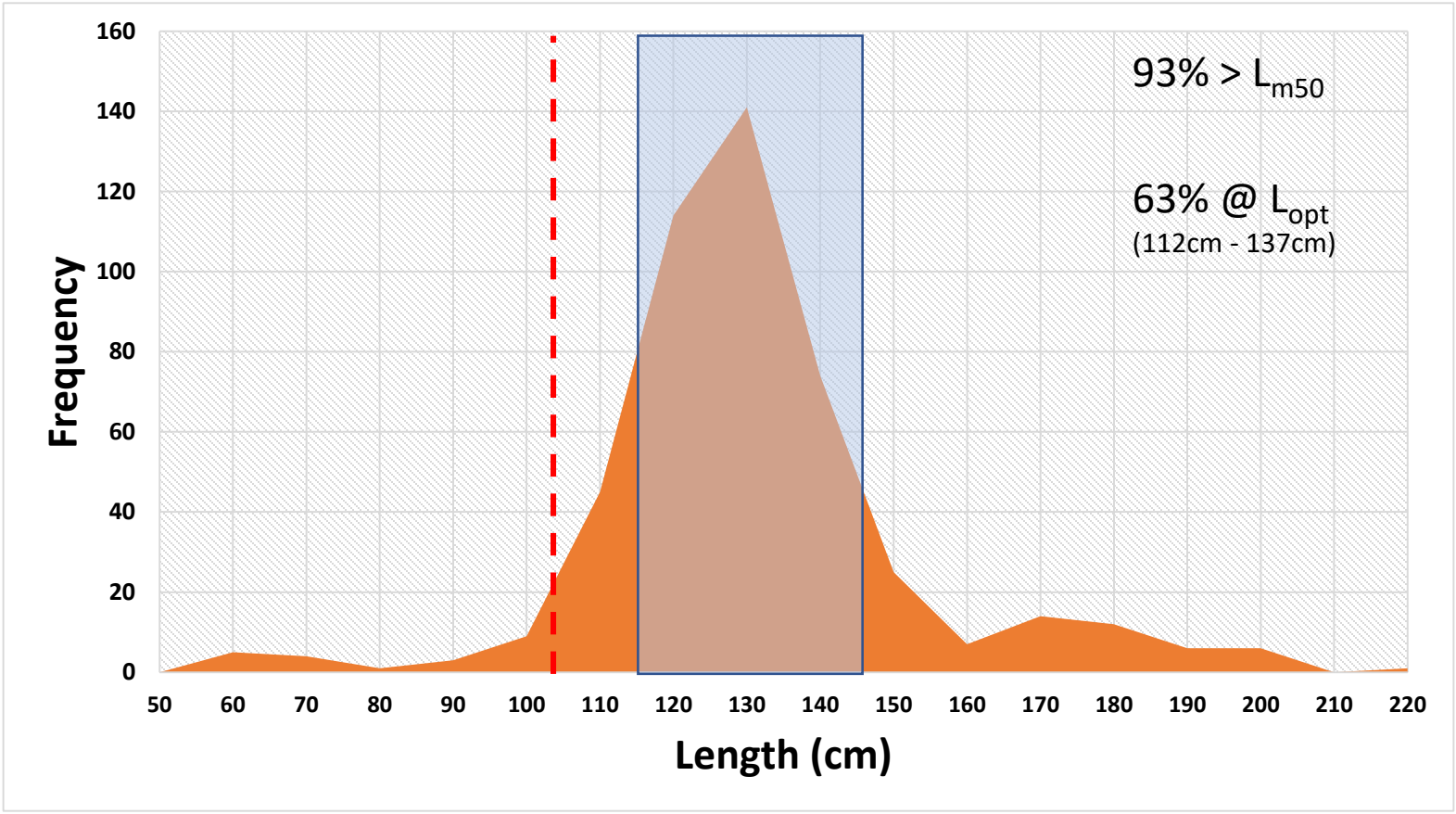

N
56°0.0′E
58°0.0′E
60°0.0′E
62°0.0′E
64°0.0′E
66°0.0′E
68°0.0′E
70°0.0′E
72°0.0′E
74°0.0′E
76°0.0′E
78°0.0′E
80°0.0′E
82°0.0′E
84°0.0′E
86°0.0′E
12°0.0′N
10°0.0′N
8°0.0′N
6°0.0′N
4°0.0′N
2°0.0′N
0°0.0′
2°0.0′S
4°0.0′S
6°0.0′S
8°0.0′S
250
0
250
500 km
Target Species
YFT

Results – Length frequency data for yellowfin tuna

From 518 total yellowfin tuna specimens, 467 length data were extracted. Minimum was 52.7 cm and maximum was 214.8 cm. Average was 125.9 cm.



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Crew-based observer program- Outcome

Species	Total	Retained		Discarded Alive		Discarded Dead	
		n	%	n	%	n	%
Yellowfin tuna	**518**	**518**	**100.0%**	**0**	**0.0%**	**0**	**0.0%**
Other capture species	**151**	**132**	**87.4%**	**4**	**2.6%**	**15**	**9.9%**
Protected species	**6**	**0**	**0.0%**	**6**	**100.0%**	**0**	**0.0%**
Common Bottlenose Dolphin	3	0	0.0%	3	100.0%	0	0.0%
Leatherback sea turtle	1	0	0.0%	1	100.0%	0	0.0%
Oceanic whitetip shark	1	0	0.0%	1	100.0%	0	0.0%
Olive ridley turtle	1	0	0.0%	1	100.0%	0	0.0%
	675	**650**	**96.3%**	**10**	**1.5%**	**15**	**2.2%**

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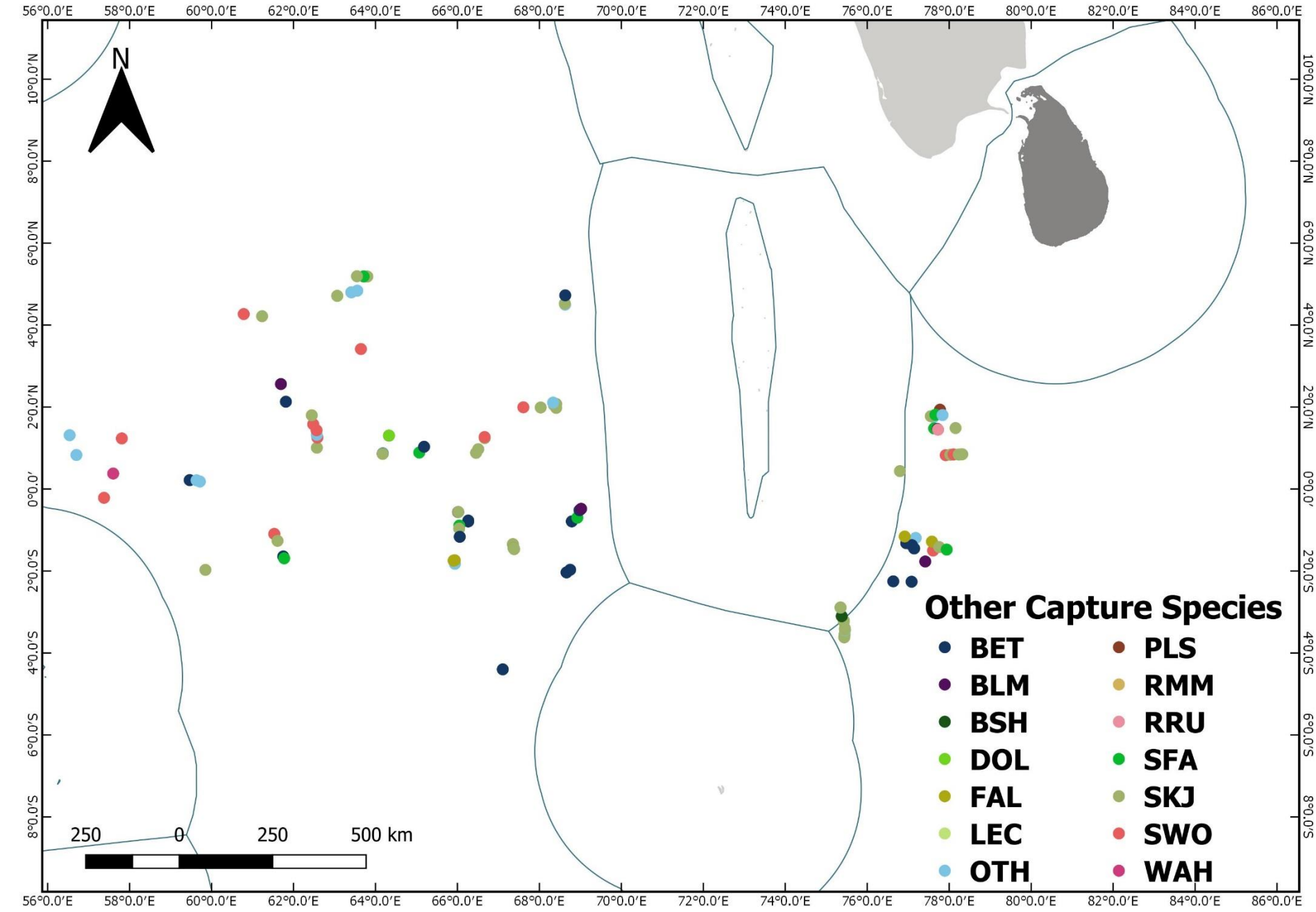
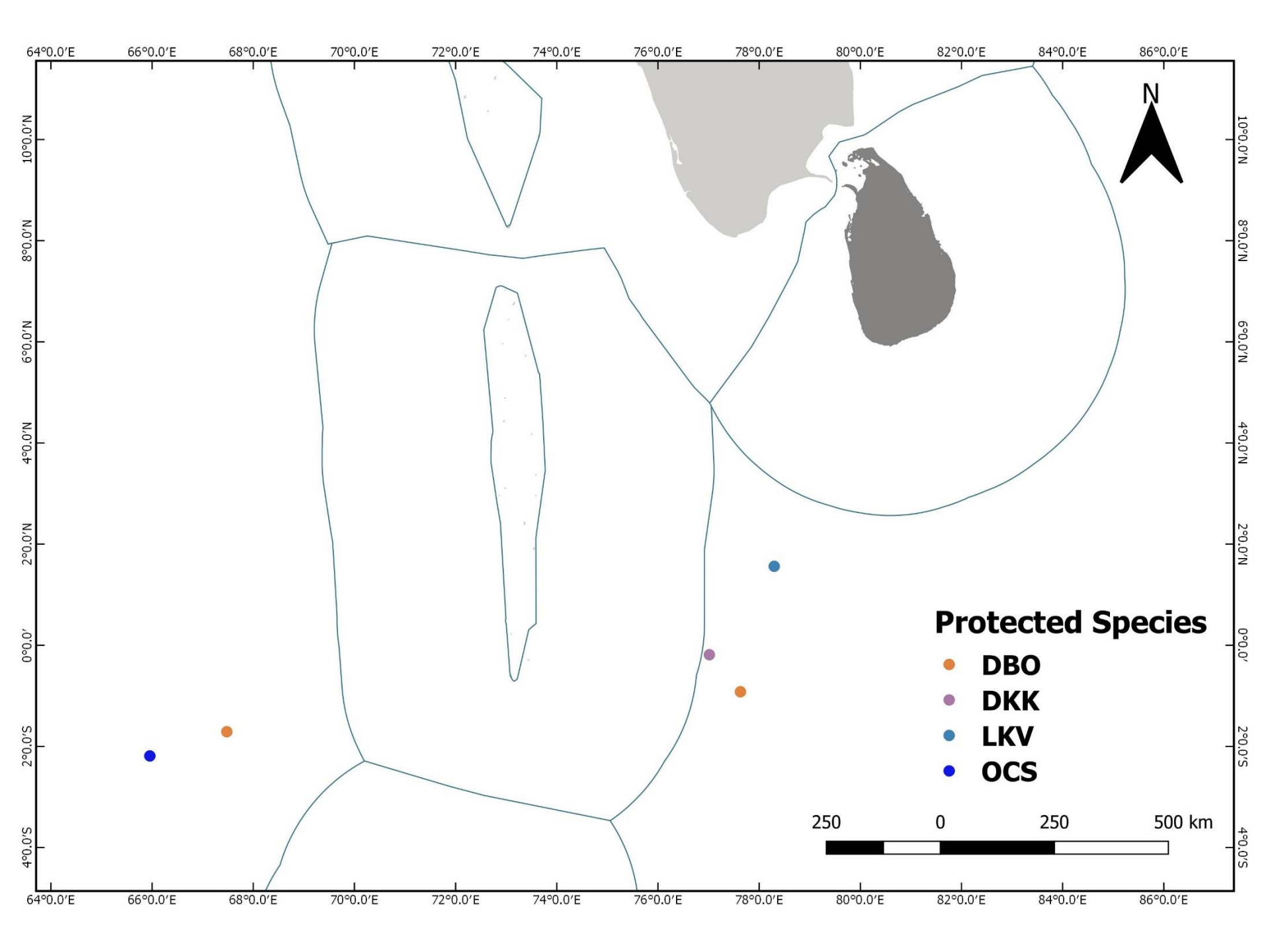

N
Other Capture Species
BET
BLM
BSH
DOL
FAL
LEC
OTH
PLS
RMM
RRU
SFA
SKJ
SWO
WAH
250
0
250
500 km
56°0.0′E
58°0.0′E
60°0.0′E
62°0.0′E
64°0.0′E
66°0.0′E
68°0.0′E
70°0.0′E
72°0.0′E
74°0.0′E
76°0.0′E
78°0.0′E
80°0.0′E
82°0.0′E
84°0.0′E
86°0.0′E
10°0.0′N
8°0.0′N
6°0.0′N
4°0.0′N
2°0.0′N
0°0.0′
2°0.0′S
4°0.0′S
6°0.0′S
8°0.0′S


64°0.0′E
66°0.0′E
68°0.0′E
70°0.0′E
72°0.0′E
74°0.0′E
76°0.0′E
78°0.0′E
80°0.0′E
82°0.0′E
84°0.0′E
86°0.0′E
10°0.0′N
8°0.0′N
6°0.0′N
4°0.0′N
2°0.0′N
0°0.0′
2°0.0′S
4°0.0′S
N
Protected Species
DBO
DKK
LKV
OCS
250
0
250
500 km

Observations of safe handling and life release techniques

The main objective of the project is to find out what are the most relevant tool kit for safe handling and live release of protected species in longline fishery.

Species	Number			Weight (kg)		
	n	%	CPUE	Kg	%	CPUE
Protected species	**6**	**0.9%**	**0.07**			
Common Bottlenose Dolphin	3	0.4%	0.03	-	0.0%	0.0
Leatherback sea turtle	1	0.1%	0.01	-	0.0%	0.0
Oceanic whitetip shark	1	0.1%	0.01	-	0.0%	0.0
Olive ridley	1	0.1%	0.01	10	0.0%	0.1
Grand Total	**675**			**23,885**		

The catch of Common Bottlenose Dolphin per 1000 hooks is 0.03.

so

It will need 33,333 hooks to catch one common bottlenose dolphin

or

One dolphin every three trips

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Observations of safe handling and life release techniques-Turtles

Releasing a leatherback turtle by using long handled de-hooker and line cutter

Observations of safe handling and life release techniques-Turtles

Releasing a leatherback turtle by using long handled line cutter

Observations of safe handling and life release techniques-Turtles

Removing the hook of a sea turtle by using dipnet, car tire and bolt cutter

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Observations of safe handling and life release techniques-Turtles

Releasing a sea turtle by using long handled de-hooker in the water

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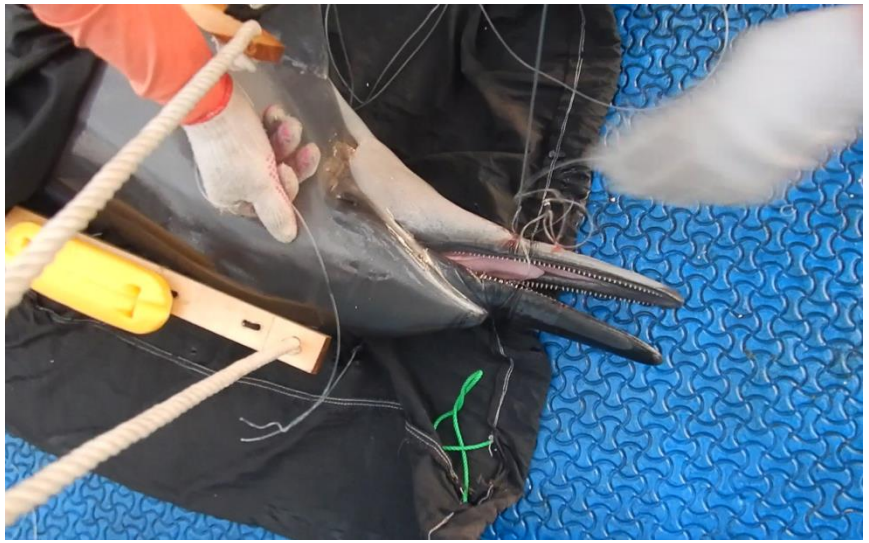
Observations of safe handling and live release techniques Mammals



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Observations of safe handling and live release techniques - Fish

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Conclusion and recommendations

The main objective of the project was to identify most proper tool kit that need to safe handle and life release of protected species in the longline fishery

Longline fishery	
Long handled de-hooker	**De-hook the animal in the water**
Long handled line cutter	
Bolt cutter	**De-hook the animal onboard**
Deep-hooked de-hooker	

Not Essential	
Short handled de-hooker	
Mouth gag	
Animal stretcher	
Dipnet	
Line cutter	
Fishing plier	

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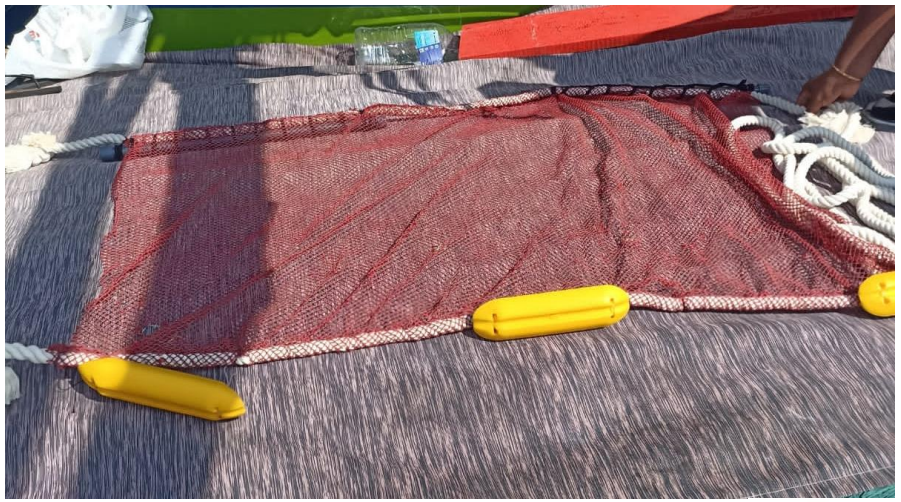
Conclusion and recommendations

- During the both deployments there were very few numbers of protected species as well as other capture species because multiday vessels were used artificial bait.

- The animal stretcher we designed was ok for small dolphins. But for large dolphins the length of the stretcher needs to be increased and weight of the sinkers need to increase to make the sling sink in the water easily.



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Conclusion and recommendations

- The dipnet need to be have more ropes to make it lift easily for large sea turtles.

- Any observer in Negombo and Chilaw didn't used Mouth gag and the De-hooker made by PVC Pipes

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Conclusion and recommendations

- The size of the bolt cutter needs to be bit increased. Otherwise it is not easy to cut the hook from 14” sized bolt cutter

- The type of fishing plier we given do not efficiently cut the line. The line cutter we given was highly useful and cut the line efficiently. But most vessels are having line cutters.

Conclusion and recommendations

- The crew based observer program will be continue to collect data of <24m vessels in Sri Lanka to gather scientific data , Specially **length data** which need to be submit by DFAR to the IOTC

- The program will be continue by **officers in DFAR**, with the support of pelagikos which they will do the training of the skipper, data collection, data analysis and report writing

- 150 toolkits including **Long handled de-hooker**, **long handled line cutter**, **bolt cutter** and **deep-hooked de-hooker** will be distributed to longline vessels operated in Negombo, Dikkowita and Beruwala harbors.

- The list of vessels will be given by the district fishery office. After distributing kits live release videos which collected by the vessels will be gathered by harbor office and send to IT Division of DFAR to upload in **public domain**

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