



SUMMARY OF GHOST NET REMOVAL AT MERGUI ARCHIPELAGO

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Photo credit to Magnus Larsson

ABSTRACT

This project addresses the immediate need for removal of abandoned fishing nets at sites frequented by recreational divers from Awei Pila Eco Resort. It is also part of an exploratory trip for volunteers to become familiar with the sites and to provide assistance in the net removal. Total of eight professional divers and two assistants is recruited by Ocean Quest for this project. The project takes place on 8th May and end on 11th May 2019. Strong winds, periodic showers and high seas is experienced during the period from 7th May until 11th May. The weather pattern is in conjunction with the super cyclone Fani that is affecting the Indian Ocean and the Andaman. Awei Pila is located in the outer reaches of this weather pattern and its western beaches are battered with moderate sea conditions. Nonetheless, the project pushed on with the use of one Rigid Inflatable Boat (RIB) and one long tail support boat provided by Awei Pila. The team is guided by Mr. Marcelo Guimaraes (Marine biologist / Diving center manager) during all dives for net removal. All logistics is arranged by the resort team and Mr. Eric Popper from Burma Boating. The support long tail boat is only utilized on the first day of the project. During the following days it is not in use as the sea conditions is not ideal for its safety. On the first day when the support boat is functional, the nets are loaded on the long tail for sorting and the process of collecting macro organisms that become entrapped in the net is made. All living organism found in the net is placed in bucket and return to the sea. However, this process cannot take place on second and third day as the conditions is too rough for the long tail boat. Instead, any macro organism found in the net during sorting on shore later will be placed in bucket and return to the sea. The team is also required to take on a rotation to refill the Scuba tanks. To maximize surface times, the team also participate in beach cleanup at the east bay and at the fishermen village. Evidence of the nets maybe contributed to local authorities for further actions against illegal fishing and encroachment of reefs in the area.



Stormy conditions during the project

WEATHER

Heavy weather is experienced throughout the period of the project. The weather pattern during that period is influenced by the cyclones in the Indian Ocean which directly affects weather in the Andaman sea. Strong gusts of winds bringing moderate to high waves into the Mergui Archipelago. The weather did not subside until the end of the project. Activities for net removal pressed on despite the weather and sea conditions. The Rigid Inflatable Boat (RIB) performs well in such conditions and it allows for the net removal activity to continue. Weather is no hindrance to the project also due to the experience of the team.

TARGET SITES

Three locations are identified as target sites for this immediate project. Within these sites there are several nets that is scattered in different parts of the reefs. See Table below:

DATE	DIVE NUMBER	LOCATION	POSITION	DEPTH RANGE (M)
MAY 8, 2019	1	Rocky Island	South East	15 - 22
MAY 8, 2019	2	Rocky Island	East	14 - 17
MAY 9, 2019	1	Rocky Island	East	18 - 22
MAY 9, 2019	2	Shark Cave	South East	14 - 23
MAY 10, 2019	1	Red Rock	South East	8 - 23

ANALYSIS OF ABANDONMENT OF GHOST NETS

Through analysis of the abandoned nets collected, it is evident that there are many occurrences of fishing activities encroaching the coral reefs in the area. This is reflected in the types of nets collected at the same site. Different types of nets in varying degree of marine growth suggests that every site are exposed to more than one net and in different times. Total of 18 types of nets are collected from 4 sites suggests that there has been repeated encroachment by fishermen in the reef areas. Types of net are mainly drift nets deployed too near to living reefs. Thick blanket of entangled nets stretching from 10 to 50 meters covering corals and have severe impact on hard corals which rely on photosynthesis.



Entangled nets covering corals blocking their ability for photosynthesis. Photo credit: Magnus Larsson

SORTING AND DISPOSAL

All nets removed from the sites are taken to shore for sorting and disposal. Any macro organism found in the nets will be placed in bucket with sea water and release in the bay. Toxic lead from the sinkers is removed from the nets prior to disposal. There are many dead corals that is entangled. They are removed and placed in the garden. Their lime and carbonate structure is good for stabilizing soil Ph. The lead sinkers are contributed to the engineering department for up cycling. The remaining nets are placed in large bag and set aside for disposal by the resort team.



Sorting process. Photo credit: Magnus Larsson

PROJECT ACCOMPLISHMENT

5 dives are made in this project. Total estimate of combined time underwater is 27 man hours. Total estimated operational time including sorting is 107 man hours. The goals for this project at the designated sites is accomplished. Abandoned nets from three sites (Rocky Island, Red Rock and Shark Cave) is fully retrieved. Target sites for the net removal is complete. With this project 310 kg of abandoned fishing gear is retrieved from 4 sites in three locations. Important data for this project is collected and compiled. However, there are still abandoned nets in the west side of Red Rock which will be retrieved by the end of the monsoon season. Other sites not targeted also have abandoned fishing gears. Over the years of neglect, many fishing nets has been abandoned in unknown number of locations. There is no data that can quantify the number of nets or volume of fishing gear that has been abandoned in the Mergui Archipelago. The remaining nets will be part of a continuation plan to restore and protect the marine ecosystem for future in tourism.



310kg of abandoned fishing gear is removed from 3 locations. Photo credit: Magnus Larsson

COMPILED DATA SHEETS

Net no.	01	Type of twine	twisted
Date	8 May 2019	No. of strands (Twine no. x no. of strands/twine)	3x10=30
Location	Rocky Island	Net material	synthetic
Latitude	98°03'32"E	Twine diameter	0.5 mm
Longitude	10°30'38"N	Net colour	green
Mesh measurement	60x60 mm	Attachments found	Lead weights
Webbing dimension	110 mm	Total conglomerate mass	118 kg
Net construction	knotted	Total attachment mass	5 kg

PHOTOGRAPHIC EVIDENCE



Net 01, with coin (diameter 30mm) for scale



Lead weight, with coin (diameter 30mm) for scale



Conglomerate found underwater. Photo credit: Magnus Larsson





Conglomerate found underwater. Photos credited to Magnus Larsson

Net no.	02	Type of twine	twisted
Date	8 May 2019	No. of strand (twine no. x strands no.)	4x10=40
Location	Rocky Island	Net material	synthetic
Latitude	98°03'30"E	Twine diameter	0.5 mm
Longitude	10°30'37'	Net colour	grey/black
Mesh measurement	40x40 mm	Attachments found	<ul style="list-style-type: none"> • Fishing line • fishing bait
Webbing dimension	75 mm	Total conglomerate mass	118 kg
Net construction	knotted	Total attachment mass	<5 kg

PHOTOGRAPHIC EVIDENCE



Net 02, with coin (diameter 30mm) for scale



Entangled fishing lure in this net



Conglomerate found underwater. Photos credited to Magnus Larsson

Net no.	03	Type of twine	twisted
Date	8 May 2019	No. of strands (twine no. x strand no.)	3x3=9
Location	Rocky Island	Net material	synthetic
Latitude	n/a	Twine diameter	0.5 mm
Longitude	n/a	Net colour	blue
Mesh measurement	75x75 mm	Attachments found	lead weights
Webbing dimension	120 mm	Total conglomerate mass	118 kg
Net construction	knotted	Total attachment mass	5 kg

PHOTOGRAPHIC EVIDENCE



Net 03, with coin (diameter 30mm) for scale



Attachment found, with coin (diameter 30mm) for scale



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Conglomerate found underwater. Photo credit: Magnus Larsson



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Net no.	04	Type of twine	twisted
Date	8 May 2019	No. of strands (twine no. x strand no.)	6x3=18
Location	Myanmar, Awei Pila	Net material	synthetic
Latitude	n/a	Twine diameter	0.5 mm
Longitude	n/a	Net colour	grey
Mesh measurement	20x20 mm	Attachments found	-
Webbing dimension	35 mm	Total conglomerate mass	<5kg
Net construction	knotted	Total attachment mass	-

Additional notes:

Photograph of conglomerate is not available. Net 04 was found by the shore on one of the beaches of Awei Pila.

PHOTOGRAPHIC EVIDENCE



Net 04, with coin (diameter 30 mm) for scale

Net no.	05	Type of twine	monofilament
Date	8 May 2019	No. of strands (twine no. x strand no.)	1x25=25
Location	Myanmar, Awei Pila	Net material	Synthetic
Latitude	n/a	Twine diameter	0.5 mm
Longitude	n/a	Net colour	green
Mesh measurement	65x65 mm	Attachments found	-
Webbing dimension	135 mm	Total conglomerate mass	118 kg
Net construction	knotted	Total attachment mass	-

PHOTOGRAPHIC EVIDENCE



Net 05, with coin (diameter 30 mm) for scale



Conglomerate found underwater. Photos credited to Magnus Larsson

Net no.	06	Type of twine	Twisted
Date	9 May 2019	No. of strands (twine no. x strand no.)	3x3=9
Location	Rocky Island	Net material	synthetic
Latitude	n/a	Twine diameter	0.5 mm
Longitude	n/a	Net colour	green
Mesh measurement	24x24 mm	Attachments found	lead weights
Webbing dimension	35 mm	Total conglomerate mass	74 kg
Net construction	knotted	Total attachment mass	2 kg

PHOTOGRAPHIC EVIDENCE



Net 06, with coin (diameter 30mm) for scale



Attachment found. No scale

Net no.	07	Type of twine	twisted
Date	9 May 2019	No. of strands (twine no. x strands no.)	3x10=30
Location	Shark Cave	Net material	synthetic
Latitude	97°58'17"	Twine diameter	0.5 mm
Longitude	10°37'32"	Net colour	green
Mesh measurement	65x65 mm	Attachments found	-
Webbing dimension	120 mm	Total conglomerate mass	74 kg
Net construction	knotted	Total attachment mass	-

PHOTOGRAPHIC EVIDENCE



Net 07 with coin (diameter 30mm) for scale



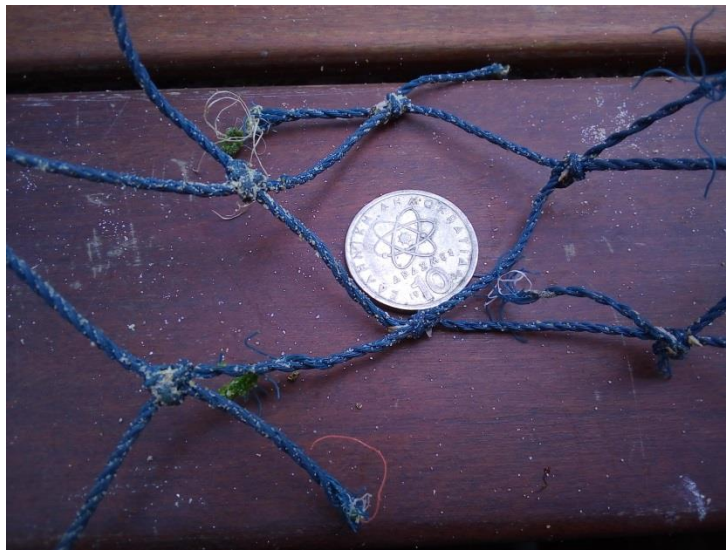
Conglomerate found underwater. Photo credit: Magnus Larsson



Marine life trapped by the nets. Photos credited to Magnus Larsson

Net no.	08	Type of twine	twisted
Date	9 May 2019	No. of strands (twine no. x strand no.)	3x10=30
Location	Shark Cave	Net material	synthetic
Latitude	n/a	Twine diameter	0.5 mm
Longitude	n/a	Net colour	blue
Mesh measurement	40x40 mm	Attachments found	-
Webbing dimension	90 mm	Total conglomerate mass	74 kg
Net construction	knotted	Total attachment mass	-

PHOTOGRAPHIC EVIDENCE



Net 08, with coin (diameter 30 mm) for scale

Net no.	09	Type of twine	monofilament
Date	9 May 2019	No. strands (twine no. x strand no.)	1x20=20
Location	Rocky Island	Net material	synthetic
Latitude	n/a	Twine diameter	0.5 mm
Longitude	n/a	Net colour	green
Mesh measurement	70x70 mm	Attachments found	-
Webbing dimension	130 mm	Total conglomerate mass	74 kg
Net construction	knotted	Total attachment mass	-

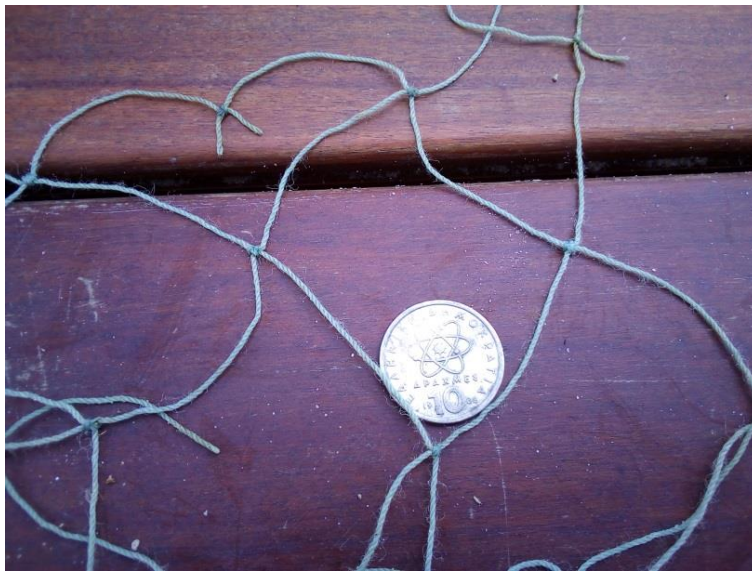
PHOTOGRAPHIC EVIDENCE



Net 09, with coin (diameter 30 mm) for scale

Net no.	10	Type of twine	twisted
Date	9 May 2019	No. of strands (twine no. x strand no.)	3
Location	Myanmar, Awei Pila	Net material	natural
Latitude	n/a	Twine diameter	1 mm
Longitude	n/a	Net colour	green
Mesh measurement	60x60 mm	Attachments found	-
Webbing dimension	120 mm	Total conglomerate mass	74 kg
Net construction	knotted	Total attachment mass	-

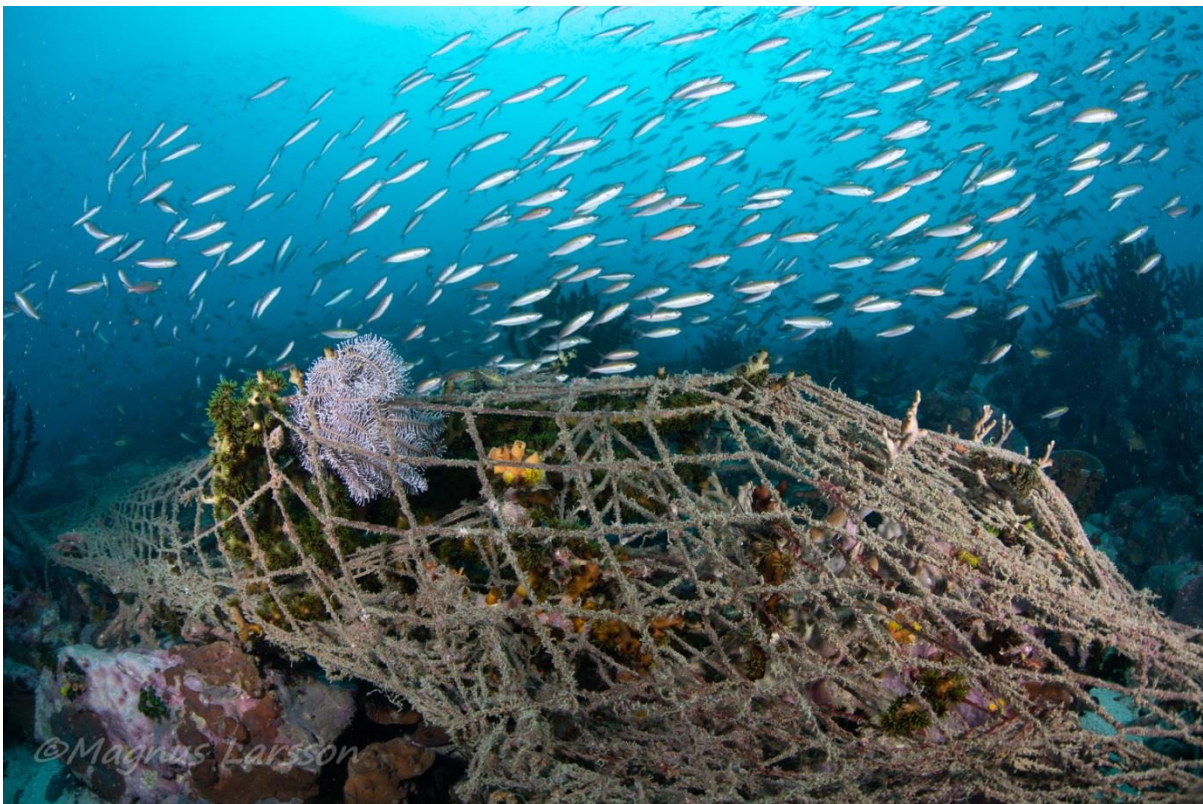
PHOTOGRAPHIC EVIDENCE



Net 10, with coin (diameter 30 mm) for scale



Conglomerate found underwater. Photo credited to Magnus Larsson



Marine life trapped by the nets. Photos credited to Magnus Larsson.

Net no.	11	Type of twine	twisted
Date	9 May 2019	No. of strands (twine no. x strand no.)	3x4=12
Location	Shark Cave	Net material	synthetic
Latitude	n/a	Twine diameter	0.5 mm
Longitude	n/a	Net colour	green
Mesh measurement	60x60 mm	Attachments found	floats
Webbing dimension	110 mm	Total conglomerate mass	74 kg
Net construction	knotted	Total attachment mass	<5 kg

PHOTOGRAPHIC EVIDENCE



Net 11, with coin (diameter 30 mm) for scale



Attachments found, with coin (diameter 30 mm) for scale



Conglomerate found underwater. Marine life trapped by the nets. Photos credited to Magnus Larsson

Net no.	12	Type of twine	twisted
Date	9 May 2019	No. of strands (twine no. x strand no.)	3x4=12
Location	Shark Cave	Net material	synthetic
Latitude	n/a	Twine diameter	0.5 mm
Longitude	n/a	Net colour	green
Mesh measurement	65x65 mm	Attachments found	-
Webbing dimension	120 mm	Total conglomerate mass	74 kg
Net construction	knotted	Total attachment mass	-

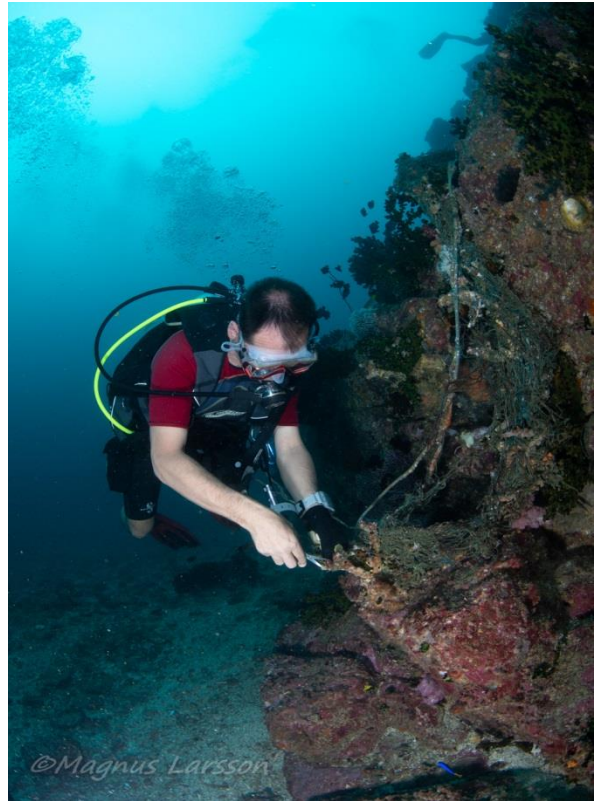
PHOTOGRAPHIC EVIDENCE



Net 12, with coin (diameter 30 mm) for scale



Conglomerate found underwater. Photo credited to Magnus Larsson



Marine life trapped by the nets. Photos credited to Magnus Larsson.

Net no.	13	Type of twine	monofilament
Date	9 May 2019	No. of strands (twine no. x strand no.)	1
Location	Shark cave	Net material	synthetic
Latitude	n/a	Twine diameter	0.5 mm
Longitude	n/a	Net colour	transparent/white
Mesh measurement	30x30 mm	Attachments found	-
Webbing dimension	55 mm	Total conglomerate mass	74 kg
Net construction	knotted	Total attachment mass	-

Additional note:

Photograph of Net 13 has been sharpened for better viewing.

PHOTOGRAPHIC EVIDENCE



Net 13, with coin (diameter 30 mm) for scale



Conglomerate found underwater. Photo credited to Magnus Larsson





Entanglement of different types of nets. Photos credited to Magnus Larsson.

Net no.	14	Type of twine	monofilament
Date	9 May 2019	No. of strands (twine no. x strand no.)	1x10=10
Location	Shark Cave	Net material	synthetic
Latitude	n/a	Twine diameter	0.5 mm
Longitude	n/a	Net colour	black
Mesh measurement	20x20 mm	Attachments found	-
Webbing dimension	45 mm	Total conglomerate mass	74 kg
Net construction	knotted	Total attachment mass	-

PHOTOGRAPHIC EVIDENCE



Net 14, with coin (diameter 30 mm) for scale

Net no.	15	Type of twine	braided
Date	10 May 2019	No. of strands (twine no. x strand no.)	1x4=4
Location	Red Rock	Net material	synthetic
Latitude	98°01'25"	Twine diameter	0.5 mm
Longitude	10°42'04"	Net colour	green
Mesh measurement	5x5 mm	Attachments found	-
Webbing dimension	10 mm	Total conglomerate mass	118 kg
Net construction	knotless	Total attachment mass	-

PHOTOGRAPHIC EVIDENCE



Net 15, with coin (diameter 30 mm) for scale

Net no.	16	Type of twine	twisted
Date	10 May 2019	No. of strands (twine no. x strand no.)	4x2=8
Location	Red Rock	Net material	synthetic
Latitude	n/a	Twine diameter	0.5 mm
Longitude	n/a	Net colour	green
Mesh measurement	30x30 mm	Attachments found	-
Webbing dimension	70 mm	Total conglomerate mass	118 kg
Net construction	knotted	Total attachment mass	-

PHOTOGRAPHIC EVIDENCE



Net 16, with coin (diameter 30 mm) for scale



Conglomerate found underwater. Photo credited to Magnus Larsson.

Net no.	17	Type of twine	single
Date	10 May 2019	No. of strands (twine no. x strand no.)	1
Location	Red Rock	Net material	monofilament
Latitude	n/a	Twine diameter	0.5 mm
Longitude	n/a	Net colour	transparent
Mesh measurement	30x30 mm	Attachments found	-
Webbing dimension	55 mm	Total conglomerate mass	118 kg
Net construction	knotted	Total attachment mass	-

PHOTOGRAPHIC EVIDENCE



Net 17, with coin (diameter 30 mm) for scale

Net no.	18	Type of twine	twisted
Date	10 May 2019	No. of strands (twine no. x strand no.)	3x5=15
Location	Red Rock	Net material	synthetic
Latitude	n/a	Twine diameter	0.5 mm
Longitude	n/a	Net colour	green
Mesh measurement	20x20 mm	Attachments found	-
Webbing dimension	40 mm	Total conglomerate mass	118 kg
Net construction	knotted	Total attachment mass	-

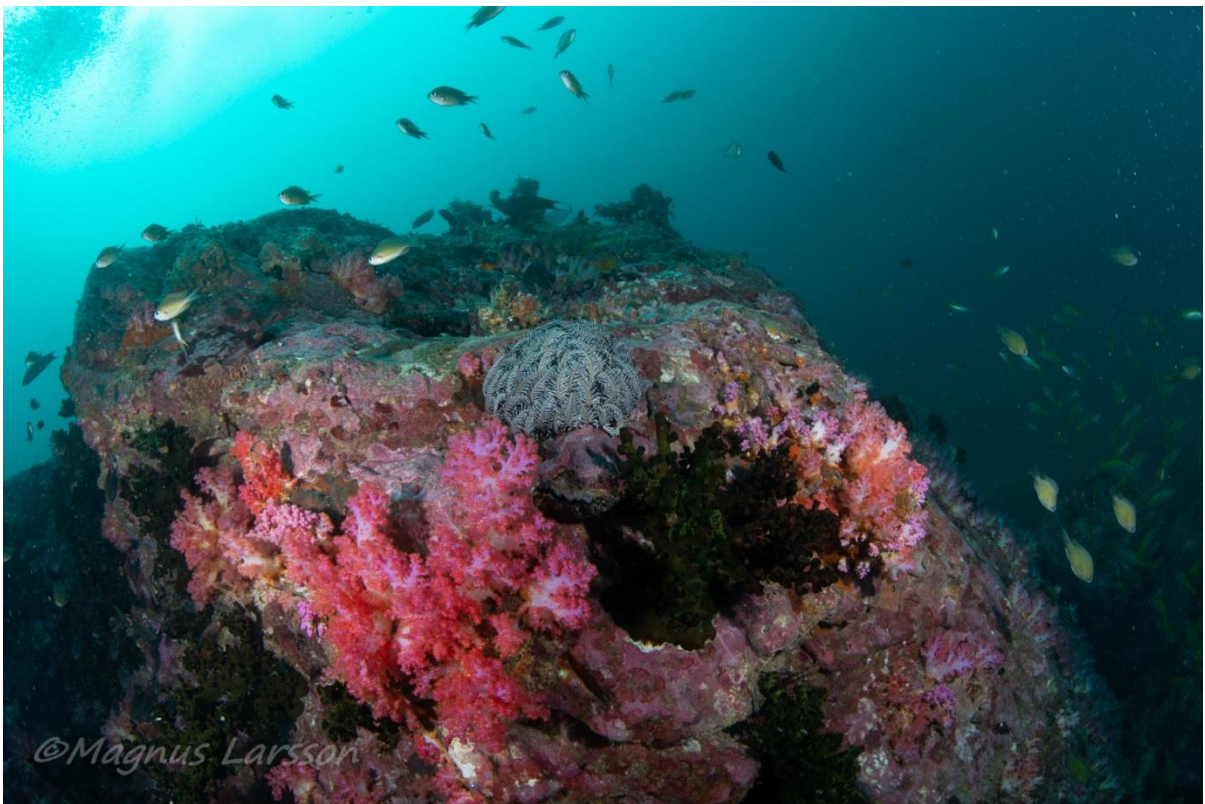
PHOTOGRAPHIC EVIDENCE



Net 18, with coin (diameter 30 mm) for scale



Conglomerate found underwater. Photo credited to Magnus Larsson.



Photos credited to Magnus Larsson.

Net no.	19	Type of twine	twisted
Date	10 May 2019	No. of strands (twine no. x strand no.)	3x3=9
Location	Myanmar, Awei Pila	Net material	synthetic
Latitude	n/a	Twine diameter	0.5 mm
Longitude	n/a	Net colour	green
Mesh measurement	40x40 mm	Attachments found	Drift wood
Webbing dimension	60 mm	Total conglomerate mass	<5 kg
Net construction	knotted	Total attachment mass	<5 kg

PHOTOGRAPHIC EVIDENCE



Net 19, with coin (diameter 30 mm) for scale



Conglomerate taken from the shore

Net no.	20	Type of twine	twisted
Date	11 May 2019	No. of strands (twine no. x strands no.)	2x2=4
Location	Myanmar, Awei Pila	Net material	synthetic
Latitude	n/a	Twine diameter	0.5 mm
Longitude	n/a	Net colour	green
Mesh measurement	35x35 mm	Attachments found	-
Webbing dimension	65 mm	Total conglomerate mass	<5 kg
Net construction	knotted	Total attachment mass	-

Additional note:

Photograph of conglomerate is not available. Net 20 was found by the shore during a beach cleanup.

PHOTOGRAPHIC EVIDENCE



Net 20, with coin (diameter 30 mm) for scale



Example of conglomerate found. Photo credited to Magnus Larsson.



Beach cleanup taking place on the beaches of Awei Pila. Photo credited to Magnus Larsson.

Net no.	21	Type of twine	twisted
Date	11 May 2019	No. of strands (twine no. x strand no.)	3x3=9
Location	Myanmar, Awei Pila	Net material	synthetic
Latitude	n/a	Twine diameter	0.5 mm
Longitude	n/a	Net colour	green
Mesh measurement	25x25 mm	Attachments found	-
Webbing dimension	55 mm	Total conglomerate mass	<5 kg
Net construction	knotted	Total attachment mass	-

Additional note:

Photograph of conglomerate is not available. Net 21 was found on the shore during a beach cleanup.

PHOTOGRAPHIC EVIDENCE



Net 21, with coin (diameter 30 mm) for scale



Example of conglomerate found. Photo credited to Magnus Larsson.



Beach cleanup taking place on the beaches of Awei Pila. Photos credited to Magnus Larsson.

Net. No	22	Type of twine	twisted
Date	11 May 2019	No. of strands (twine no. x strand no.)	3x4=12
Location	Myanmar, Awei Pila	Net material	synthetic
Latitude	n/a	Twine diameter	0.5 mm
Longitude	n/a	Net colour	green
Mesh measurement	85x85 mm	Attachments found	Lead weights
Webbing dimension	200 mm	Total conglomerate mass	<5 kg
Net construction	<ul style="list-style-type: none"> • Knotted • Double twine up 	Total attachment mass	<5 kg

Additional note:

Photograph of conglomerate is not available. Net 22 was found by the shore during a beach clean up.

PHOTOGRAPHIC EVIDENCE



Net 22, with coin (diameter 30 mm) for scale



Attachments found, with coin (diameter 30 mm) for scale





Beach cleanup taking place on the beaches of Fishermen village. Photos credited to Magnus Larsson.