
2023 PMRS ANNUAL REPORT



OVERVIEW

Who We Are



- Perhentian Marine Research Station (PMRS) was established in 2017 by a conservation based social enterprise named Fuze Ecoteer Outdoor Adventures.
- The station aims **to better understand the marine ecosystems and to improve resource management** in Perhentian Islands.
- PMRS focuses on **monitoring the health of the island's marine ecosystems** and **committed to combine scientific findings with a bio-cultural conservation approach to sustain the dynamic and interdependence of social-ecological systems.**
- Throughout the establishment, PMRS has mapped marine habitats in the Marine Park to assess the health of coral reefs and actively engage the stakeholders toward the sustainable practices.
- In 2023, PMRS has able **to accelerate the execute of conservation strategies for marine conservation as a whole.**



OVERVIEW

Aims and Objectives

WE **EXPLORE** THE MARINE ECOSYSTEM CONSCIOUSLY

WE **EMPOWER** THE COASTAL COMMUNITY

WE **ENRICH** THROUGH CONSERVATION

- To preserve the reefs & marine life from tourism impacts, & create awareness to the community & stakeholders so we can eventually become obsolete.
- To create a baseline of data to continue to monitor the environmental impacts surrounding the islands.
- To integrate marine conservation into socio-economy of island community.



WHAT WE DO





ECOSYSTEM
SURVEYS

HABITAT
RESTORATION



SCIENTIFIC
EXPLORATION

ECO TOURS &
VOLUNTEERING
PROGRAM



#ANAKPULAU



PLASTIC FREE
PERHENTIAN INITIATIVE

GHOSNET &
UNDERWATER CLEAN UP



PUBLIC
AWARENESS

PMRS CREW

House of 2023

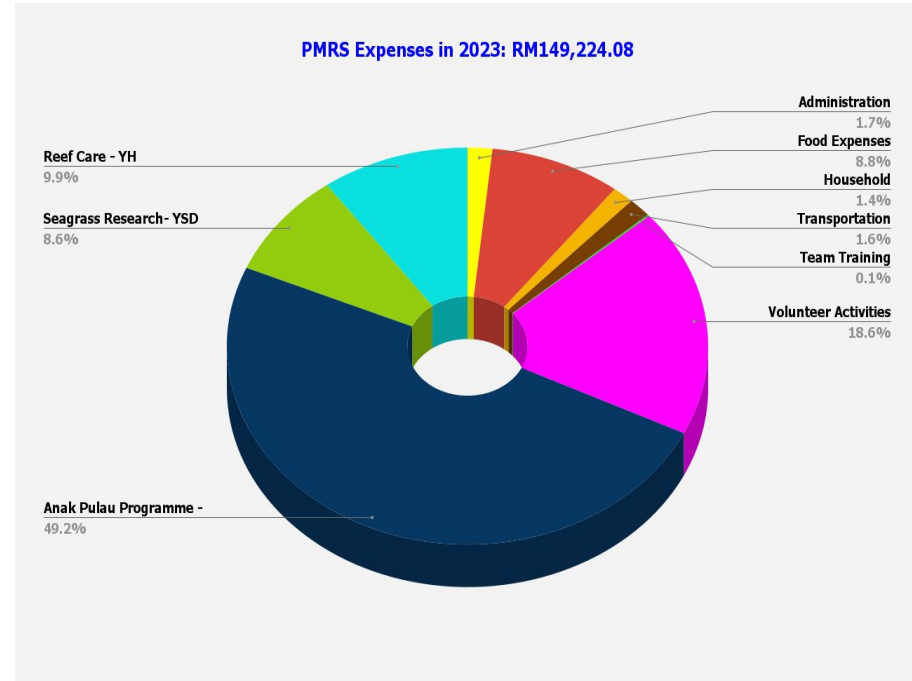
- Crew capacity: **3 staff and 5 interns.**
- PMRS 2023 operation was supported by the committed interns who has given a significant contribution to ensure PMRS run smoothly.



Finance

- The chart shows the breakdown of PMRS overall expenses in 2023

Administration	RM2,482.00
Food Expenses	RM13,159.94
Household	RM2,163.93
Transportation	RM2,340.00
Team Training	RM160.00
Volunteer Activities	RM27,787.00
Anak Pulau Programme - MOF	RM73,468.71
Seagrass Research- YSD	RM12,865.00
Reef Care - YH	RM14,817.50
TOTAL EXPENSES	RM149,224.08
BALANCE TO 2024	RM3,050.00



Volunteering program

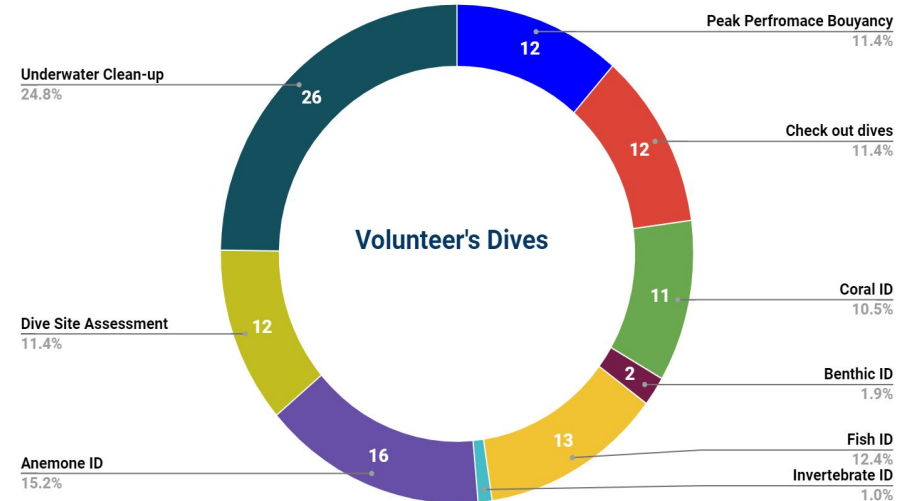


- In 2023, PMRS continuing its volunteering program with the capacity of 6 volunteers per week. The program has been structured to support PMRS conservation strategies in 2023.
- Throughout the 2023 season, PMRS volunteering program has achieved the following:-
 - ❑ **22 volunteers** with **44 volunteering weeks**.
 - ❑ A total of **105 dives** conducted throughout the volunteering weeks.
 - ❑ **24 beach clean-ups** with a **total of 1193.13 kg** of trash.
 - ❑ **26 underwater clean-up** with **total of 193.6kg** of marine debris removed from the seafloor.



Volunteer's conservation dives

- PMRS volunteer's activities has been designed to contribute towards the conservation efforts in Perhentian Islands.
- **A total of 22 volunteers with 105 dives throughout 44 volunteering weeks.**
- The underwater activities covering;
 - Skill dives
 - Educational dives
 - Data collection dives
 - Action dives

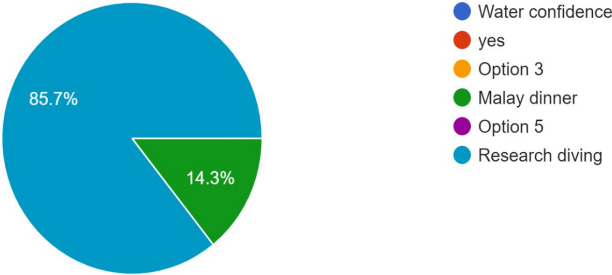


SUSTAINABILITY IMPACT

Volunteer's Feedback

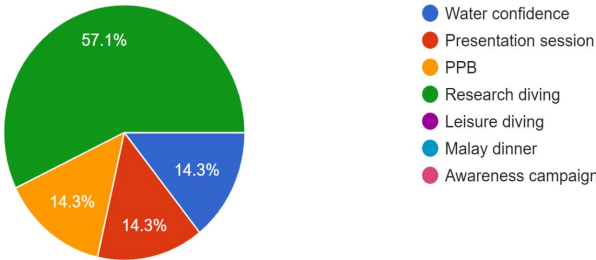
What did you enjoy from the most through your volunteer experience?

7 responses



What did you benefit from the most through your volunteer experience?

7 responses



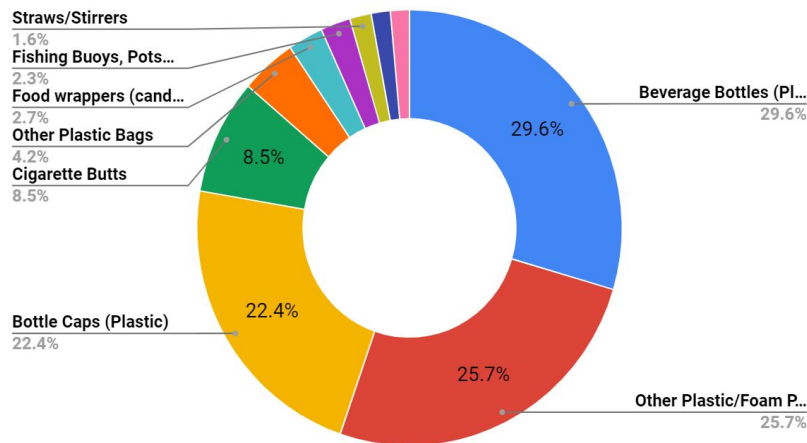
Feedback
“Learning scientific diving skills and developing a appreciation for the multiple species of corals and anemone. It helped me become more cognizant of my impact on the marine life and also the beauty of the underwater environment”
“The Coral ID and Anemone ID presentation slides were good study for me and interns taught me well before dives. I am happy to learn new things in this trip”
“Love the research diving because its fun, after we learned the knowledge about the corals & anemone, also the underwater clean up, feel so sad to see trash underwater but we manage to clean it up with team makes me feel contented”
Improvement
Accommodation & food prepared
In depth discussion on the works done by FE and PMRS. Global viewpoint.
Organised coordination. ie: more occupied & early information on the weekly schedule.

Marine Debris: Beach Clean-up

- **24 beach clean-ups** with a **total of 1193.13 kg** of trash.
- **57.6 kg** were recycled, **1135.53kg** were discarded.
- **211 person** including volunteers, FE team and public members participated in the weekly BCU.

Nesting beaches	# Cleanups	# plastic bags used
Teluk Keke (ReefCare)	4	25
Tiga Ruang Besar	2	26
Tiga Ruang Tengah	4	43
Tiga Ruang Menangis	3	14
Tanjung Butong	5	99
Romantic Beach	2	9
Pasir Acing	1	22
Panglima Abu	1	16
Other beaches		
Marine Park	1	18
Long Beach	1	12
TOTAL	24	284

List of Top 10 Marine Debris found

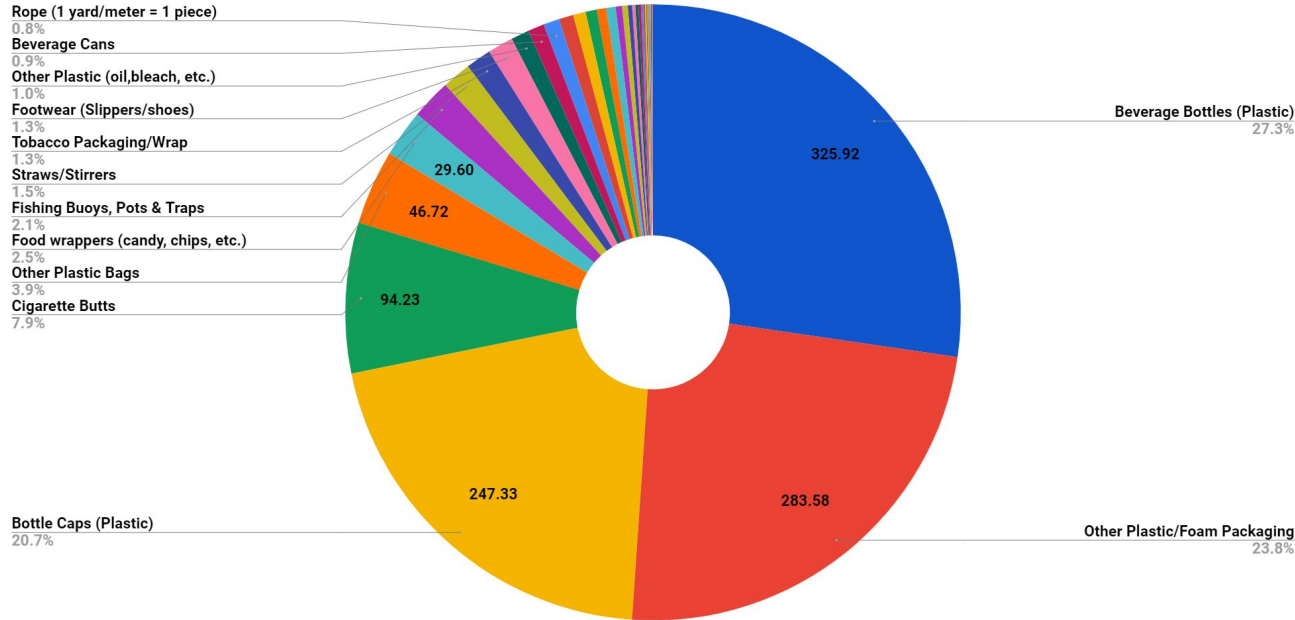


SUSTAINABILITY IMPACT

Marine Debris: Beach Clean-up



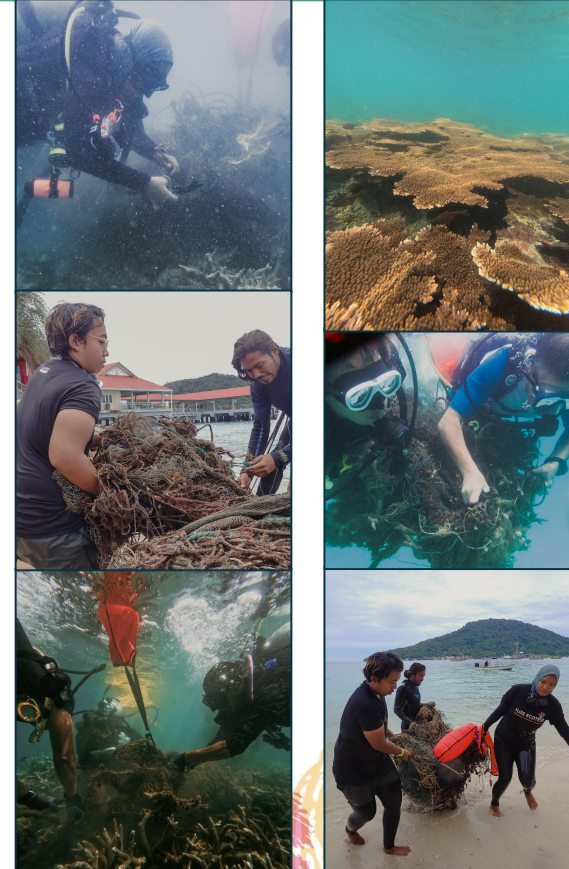
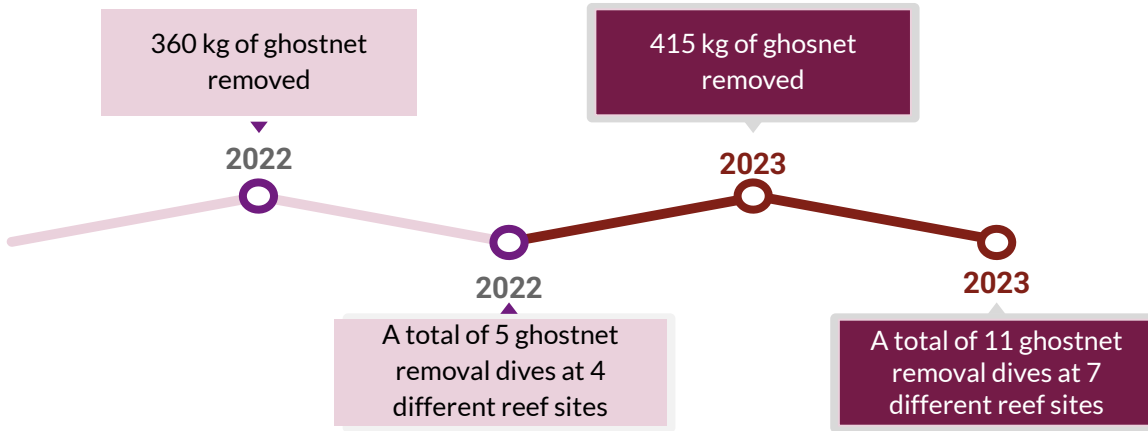
Overall Trash Collected (kg)



Marine debris travelled from Vietnam, Thailand, China, Philippines, Japan were among the trash collected around beach in Perhentian Islands

Marine Debris: Ghostnet

- Stranded ghostnets are one of the direct threat to the reef in Perhentian Island.
- Throughout 2023 season, ghostnet removal dives has become weekly activity as the stakeholder also playing a role in reporting the stranding.

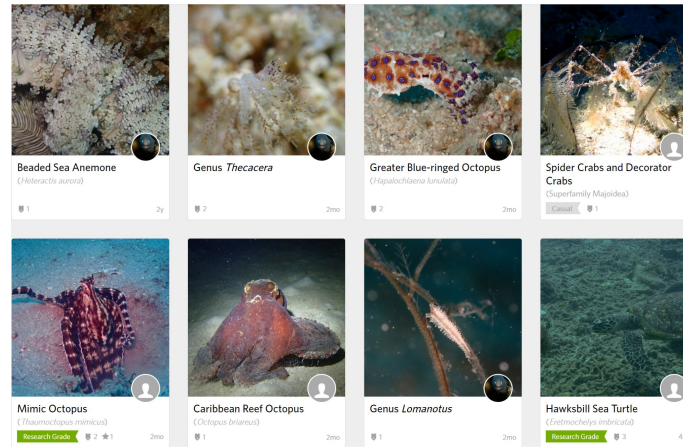
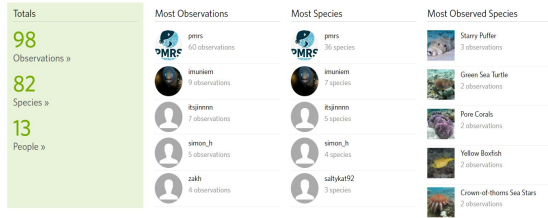


Citizen science project & public engagement

- In 2023, PMRS has launched i-Naturalist citizen science project to map the marine biodiversity of Perhentian Island.
 - [Marine Biodiversity of Perhentian Islands Project](#)
- Public submission: 38 Observations
- Awareness talk: more than 10 sessions.



Stats



Calling all naturalists!

BE A #BLUEWARRIOR TODAY

1. Create an **iNaturalist** account on the app or on iNaturalist.org
2. Search for '**Marine biodiversity of Perhentian Islands**' under the projects tab
3. Click on the project and click on the 'Join' button
4. Start observing and uploading your observations.
5. Don't forget to include our project in your submissions!

Contact us to know more:



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Perhentian Marine Research Station
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Instagram
Facebook
E-mail
Website



Dive Sites Assessment- ROLL I

Objectives:

To assess the benthic coverage and destructive impact in Perhentian Island.

To establish citizen science program through conservation dives.

- **10 dive sites** were assessed throughout the 2023 season
- **Live coral** make up the majority of the benthic coverage with **35.8% coverage**, however this is a **significant drop from the 45%** coverage observed in 2022.
- Recently dead corals have the lowest average coverage of 2.1%, interestingly this is a decrease of 0.7% compared to 2022 data.
- **Batu Layar and Seabell** were recorded to have the **highest levels of anthropogenic impacts**, with each having a cumulative impact score of 5 out of 14 parameter.. Interestingly, this **corresponds with the highest levels of algae cover** of all sites, with **Batu Layar showing 25% algae coverage and Seabell 70%**

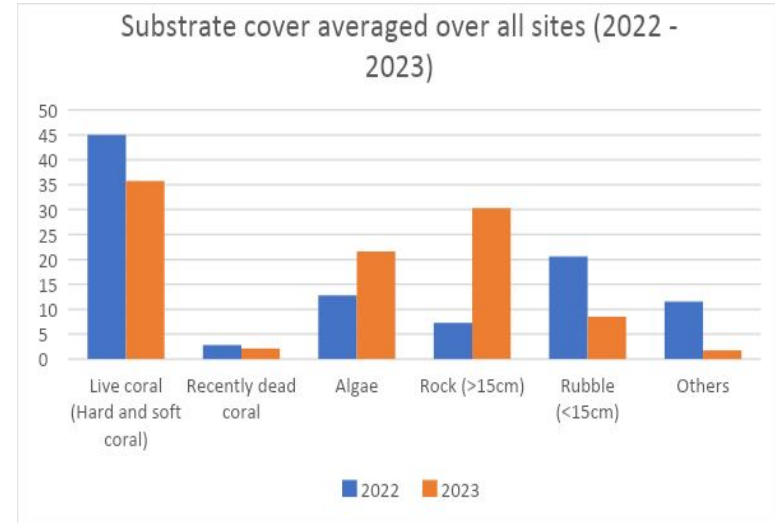


Chart 7: : Comparison of substrate cover at the different dive sites

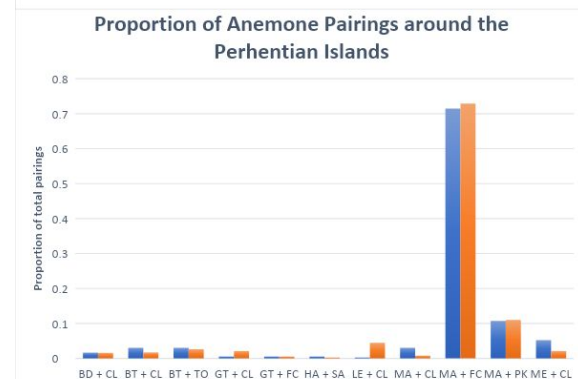
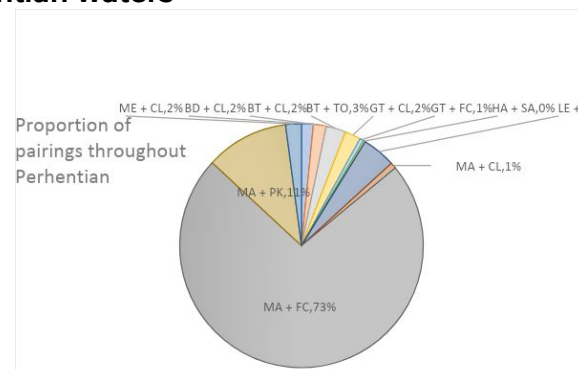
Sea Anemone & Anemonefish survey

Objectives

- To document the species of anemone and anemonefish that are present in Perhentian waters
- To record the pairings of anemonefish and their hosting anemone species

- **14 dives sites** were surveyed throughout the 2023 season
- **7 hosting species & 5 anemonefish species** with **11 unique pairing**.
- Between 2022 and 2023, proportion of **each pairing type appears to remain relatively constant**, with Magnificent Sea Anemones and False Clownfish being by far the most abundant species and pairing.

The most common sea anemone that can be found is the Magnificent Sea Anemone .	The least common sea anemone encountered is Haddon's Carpet Anemone . This low occurrence observed could be due to they grow on sandy bottoms
False Clownfish was found to be living in two different sea anemone which are Magnificent Sea Anemone and Giant carpet anemone .	Clark's anemonefish not display a preference for a particular anemone species, and could be found inhabiting multiple anemone species at the same site .
The increasing abundance of these species could become a threat to corals as the sea anemone and corals could be competing for substrate.	



Sea Anemone & Anemonefish survey

False Clown Anemonefish



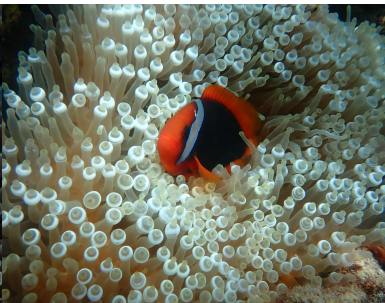
Saddleback Anemonefish



Pink Skunk Anemonefish



Tomato Anemonefish



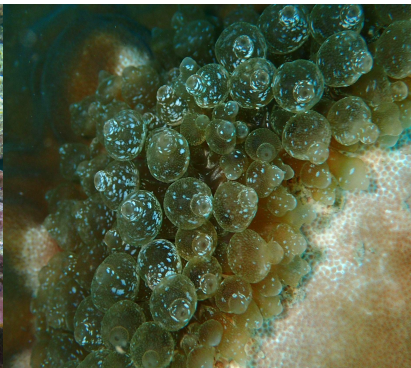
Clark's Anemonefish



Magnificent Sea Anemone



Bubble Tip Sea Anemone



Haddon's Sea Anemone



Leathery Sea Anemone



Beaded Sea Anemone



- Martin's carpet Sea Anemone
- Giant carpet Sea Anemone

Seagrass Monitoring Research : Perhentian Island

Objective: To establish the methodology for seagrass survey and monitoring in Perhentian Island & Redang Island

Seagrass survey in Perhentian Island has entered the second year. In 2023, two seagrass bed has been focused on for a detailed survey.

TELUK PAUH

- Total of **4 sections**, similar transect line as 2022 survey with **25m transect interval** and **5m data interval**.
- This study was done using modified methodologies and a datasheet from Seagrass Watch
- Percentage species coverage of **HP is significant higher than HO in Section 1 & Section 2**, while **section 3 and Section 4 has comparable species percentage between HO and HP**.
- The seagrass this year seems to be longer in terms of blade length. Also, the majority of the seagrass blades are overgrown with epiphytes
- **Overall percentage cover** of seagrass in Teluk Pauh is **24.90%**



Seagrass Monitoring Research: Perhentian Island

Overall percentage seagrass cover: 24.90%

Section 1: 31.74%

Transect	Coverage (%)	Species distribution (%)	
		HP	HO
1	31.82	91.55	8.45
2	36.93	98.75	1.25
3	26.48	99.06	0.94
4	0	0	0

Section 2: 33.81%

Transect	Coverage (%)	Species distribution (%)	
		HP	HO
1	20.91	95.92	4.08
2	43.75	94.63	5.37
3	51.93	71.84	28.16
4	18.64	100	0

Section 3: 17.36%

Transect	Coverage (%)	Species distribution (%)	
		HP	HO
1	17.39	39.17	60.83
2	17.95	34.38	65.63
3	17.61	44.81	55.19
4	16.59	100	0

Section 4: 16.70%

Transect	Coverage (%)	Species distribution (%)	
		HP	HO
1	7.84	84.57	15.43
2	11.02	43.18	56.82
3	31.25	64.74	35.26

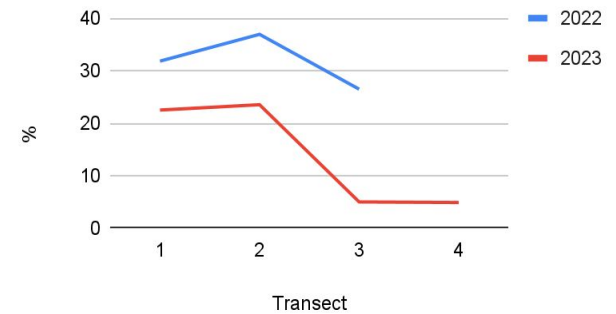
Seagrass Monitoring Research : Perhentian Island

Based on the graphs shown, almost **all of the transect is seeing a decline trend** in seagrass coverage percentage in 2023. **Section 3 is the lowest.**

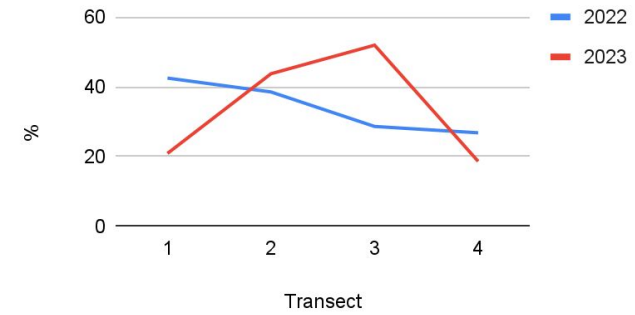
Only **transect 2 and 3 in Section 2** is showing an **increase of coverage.**

The overall coverage of seagrass is declining either due to less turtles grazing or maybe the seagrass is not growing at a high rate this year.

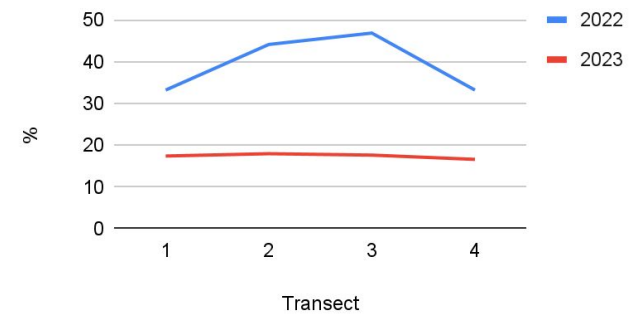
Seagrass coverage for Section 1 (%)



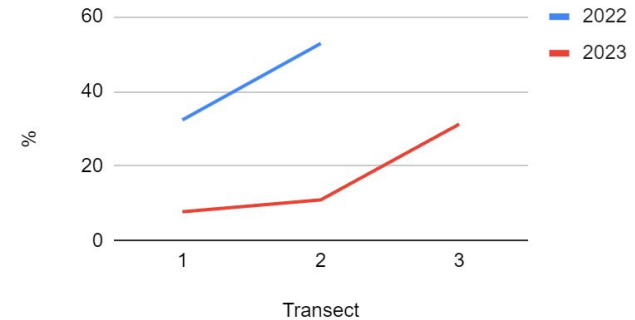
Seagrass coverage for Section 2 (%)



Seagrass coverage for Section 3 (%)



Seagrass coverage for Section 4 (%)



Seagrass Monitoring Research: Perhentian Island

Objective: To establish the methodology for seagrass survey and monitoring in Perhentian Island & Redang Island

ATAS BUSUNG

- This season, there have been an increase of turtle sightings in the area, however the turtles are more timid compared to the turtles in Teluk Pauh.
- Total of **8 transects of 100m** with **25m transect interval** and **5m data interval**.
- **Two species of seagrass** found in Atas Busung. The seagrass bed is **quite dense and is not patchy** except around the edges with a **consistent percentage, in the range of 35% - 42%**.
- **HP has higher species percentage of presence compared to HO.**
- Towards the end of every transect, there were **hydroids** present and at the end point of transect 8, there is a huge area where **Avrainvillea sp.** is present, where seagrass is not growing in that area.



Seagrass Monitoring Research : Perhentian Island

Objective: To establish the methodology for seagrass survey and monitoring in Perhentian Island & Redang Island

Average coverage: 38.21%			
Transect	Coverage (%)	Species distribution (%)	
		HP	HO
1	38.81	70.12	29.88
2	40.95	68.75	31.25
3	41.43	82.86	17.14
4	38.45	80.65	19.35
5	36.79	71.61	28.39
6	35.65	65.00	35.00
7	34.58	69.52	30.48
8	39.05	60.71	39.29



*Detailed research report will be available on PMRS website

Seagrass Monitoring Research : Perhentian Island

Gambar hydroid, shawn
the sheep



Seagrass Monitoring Research : Redang Island

Objective: To establish the methodology for seagrass survey and monitoring in Perhentian Island & Redang Island

In 2023, PMRS extended the seagrass survey in Redang Island. June was the first visit to recce the seagrass beds and in September 2023, PMRS team has surveyed 4 locations around Redang Island..

Transect	Coverage (%)	Species distribution (%)	
		HP	HO
1	24.54	65.41	34.59



TAMAN LAUT

- 100m transect laid along the coastline following the seagrass bed.
- Taman Laut has both **HP and HO species** growing in the seagrass bed at **24.54% coverage**
- Taman Laut survey point is an area which is **affected by the current movement**, however with the **24.54% of seagrass percentage** and the **presence of different seagrass species** makes it a **possible option for future surveys**.

Seagrass Monitoring Research : Redang Island

Objective: To establish the methodology for seagrass survey and monitoring in Perhentian Island & Redang Island

MACAM AYAM

- 2 transect of 100m were laid crossing the channel between Redang Island and Pinang Island, following the seagrass bed.
- **Only HP species present at the survey area.**
- Macam Ayam has the **lowest seagrass coverage with only 4.76%.**
- Seagrass was only present only up to the 70 meter point for the first transect and there were no seagrass present in the second transect.
- Given the small percentage of seagrass coverage and also with the condition of strong current, it is not recommended to keep doing a survey in that area.

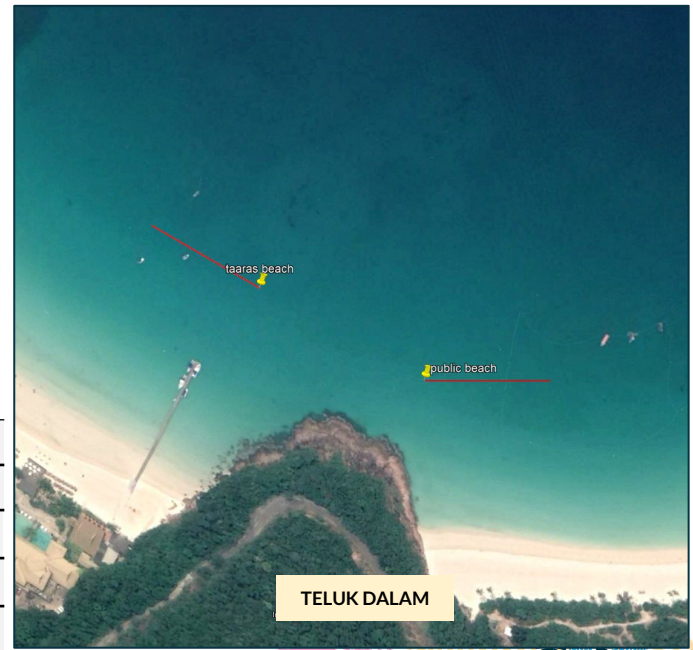
Transect	Coverage (%)	Species distribution (%)	
		HP	HO
1	4.76	0	100
2	0	0	0



Seagrass Monitoring Research : Redang Island

Objective: To establish the methodology for seagrass survey and monitoring in Perhentian Island & Redang Island

- **Only HP** is observed growing in the water of Teluk Dalam (public beach and TAARAS beach).
- **Public beach shows the highest percentage coverage in Redang Island at 34.94%**
- The seagrass in front of TAARAS beach stops at 50 meters, parallel to the shore. This could mean that the seagrass might be growing towards the deeper area instead of parallel to the shore.
- No grazing activity sighted during the survey, but one juvenile turtle exhibit grazing behaviour at the seagrass beds



Average coverage: 34.94%				Average coverage: 13.93%			
Teluk Dalam (public beach)				Teluk Dalam (TAARAS beach)			
Transect	Coverage (%)	Species distribution (%)		Transect	Coverage (%)	Species distribution (%)	
		HP	HO			HP	HO
1	34.94	100		1	13.93	100	

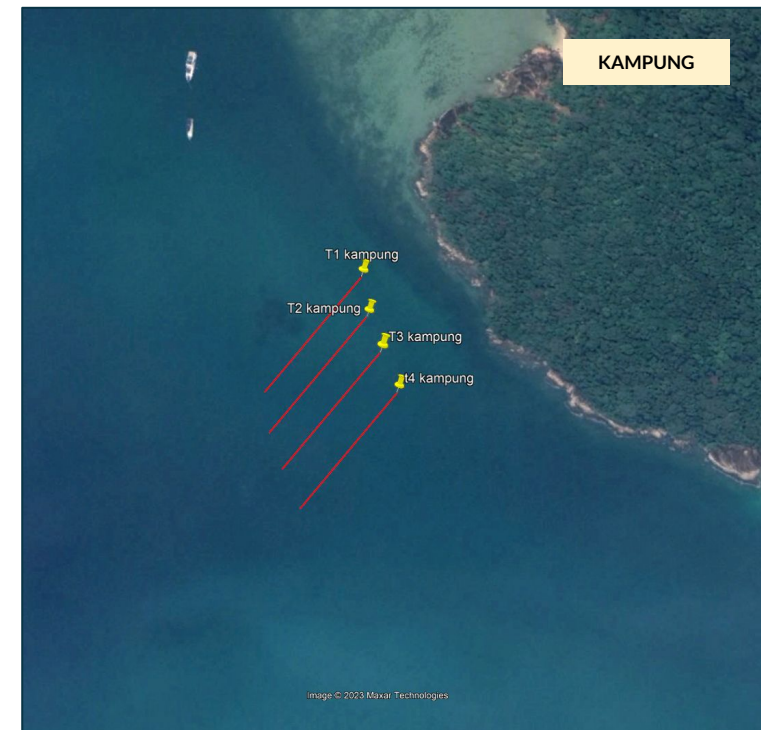
*Detailed research report will be available on PMRS website

Seagrass Monitoring Research: Redang Island

Objective: To establish the methodology for seagrass survey and monitoring in Perhentian Island & Redang Island

- Only **one seagrass species, HO** present at kampung area.
- Moving north for the intervals, the coverage of seagrass is getting smaller.
- At transect 4, seagrass stops growing at 45 meters as opposed to transect 1 where seagrass can be found up to the 95 meter point.

Average coverage: 25.27%			
Transect	Coverage (%)	Species distribution (%)	
		HP	HO
1	19.88	0	100
2	18.57	0	100
3	11.43	0	100
4	8.63	0	100



Artificial Reef Blocks

- Total number of coral blocks: **48 bottle reef blocks.**
- Total number of recruits: **45 coral baby (natural recruitment).**
- Number of nubbin: **72 fragments are thriving.**
- Monitoring and maintenance of the blocks were carried out by Rapid Response Team members.



Porite sp.



Pocillopora sp.



Acropora sp.



Pocillopora sp.



EMPOWERMENT PROGRAM



#ANAKPULAU

#ANAKPULAU is an initiative dedicated to empower the youth of Perhentian Islands. The initiative was developed to provide a platform for the local youth to learn and involve in marine conservation activities in Perhentian Islands. The members are equipped with diving qualifications and training to join conservation activities with PMRS



Rapid Response Team

- ❑ 20 trained RRT members.
- ❑ 9 certified RCM Eco-Diver
- ❑ Courses: 5 PADI open water, 3 PADI AOW, 2 PADI EFR & Rescue Diver.
- ❑ Perhentian 2023 Reef Check surveys

Junior Diver

- ❑ 5 Junior Diver members
- ❑ 3 learning dives conducted in 2023
- ❑ Secured 2 Junior Open Water course for 2024.



Rapid Response Team (RRT)



Ghostnet Removal & underwater Clean-Up

- ❑ 95% success response to stakeholder reports.
- ❑ 11 ghostnet removal dives, amounting 415kg of ghostnet.
- ❑ 2 major beach clean up.

Safety bouyline & mooring line installation

- ❑ 4 safety buoy line installation.

Coral Restoration

- ❑ 7 restoration and coral planting dives.
- ❑ 100 nubbins planted.
- ❑ 74 nubbin survived.

Recruitment & Training

- ❑ 3 newly recruited members.
- ❑ Biodiversity training dives.
- ❑ Field trip to Tioman Island.
- ❑ Offered 2 paid working opportunity.



What we learnt

In conclusion, lesson learnt from this 2023 season,

- ✓ PMRS are able to focus on the management of the station, strengthen the portfolio of the station and develop our local empowerment program #ANAKPULAU.
- ✓ PMRS has broaden its presence beyond Perhentian Island by more external collaboration with other organisations.



Next year and beyond

- Re-design our conservation strategies under the Reef Care program.
- Strengthen PMRS research portfolio and the establishment of marine research station on the island.
- Upgrading our volunteering program content to improve Volunteerism Experience with PMRS - Refining the experiential learning process.
- Improve our outreach program on marine and environmental awareness within the islands and beyond Perhentian Island.
- Strengthen our collaboration to external organisation for knowledge exchange and networking.



A big THANK YOU to

A HUGE thank you goes to our funders in 2023, without you we wouldn't have been able to achieve anything, our thanks goes to:

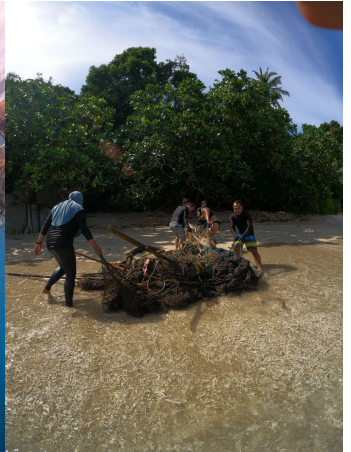
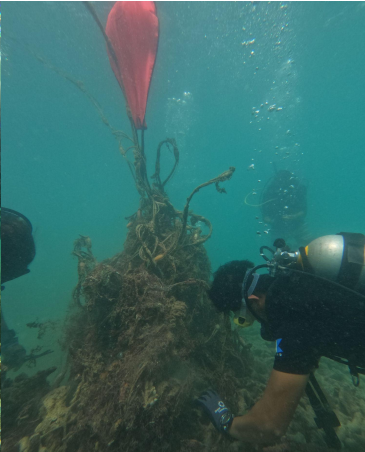
- ❖ Ministry of Finance Malaysia
- ❖ Yayasan Hasanah
- ❖ Yayasan Sime Darby

Also thank you to our collaborators in 2023, without you we wouldn't have been able to achieve to this far. Our thanks goes to:

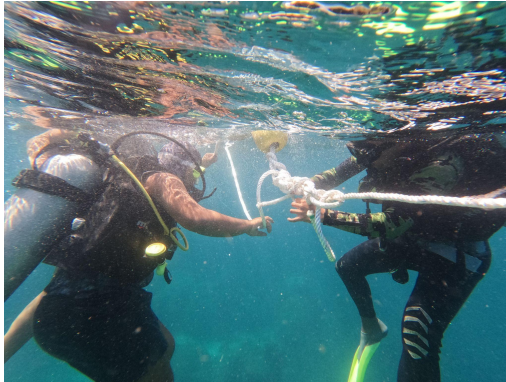
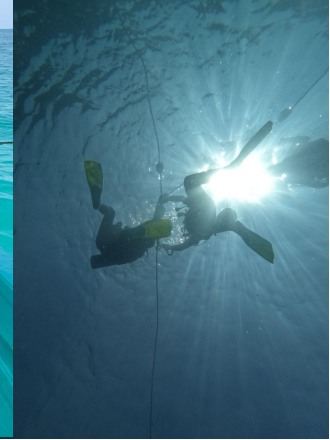
- ❖ Department of Fisheries Malaysia
- ❖ Reef Check Malaysia
- ❖ Dive centers & Chalets in Perhentian
- ❖ Boat operators
- ❖ Community of Perhentian Island



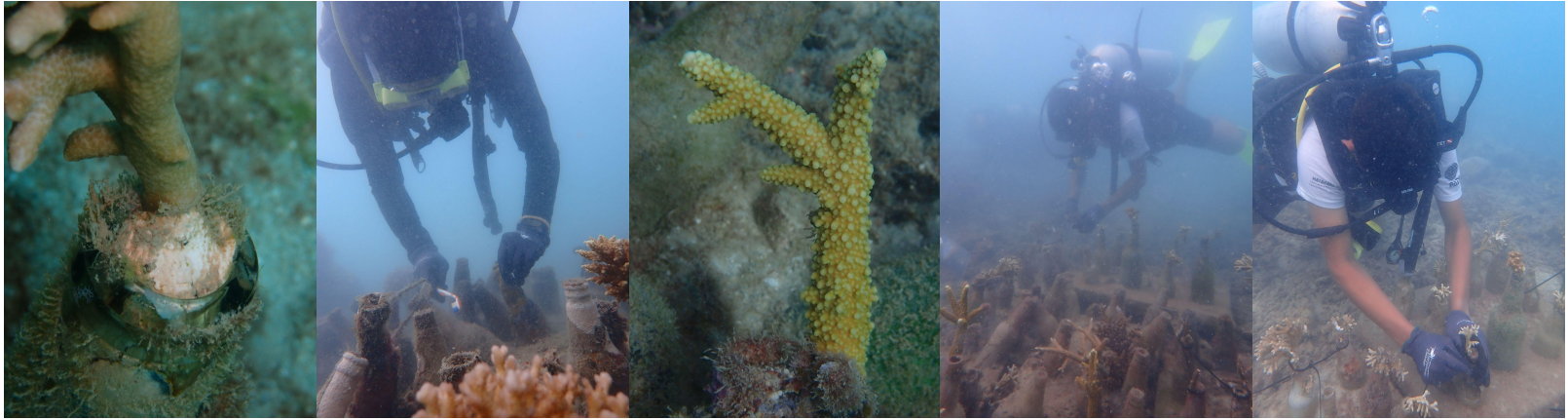
Ghostnet Removal & underwater Clean-Up



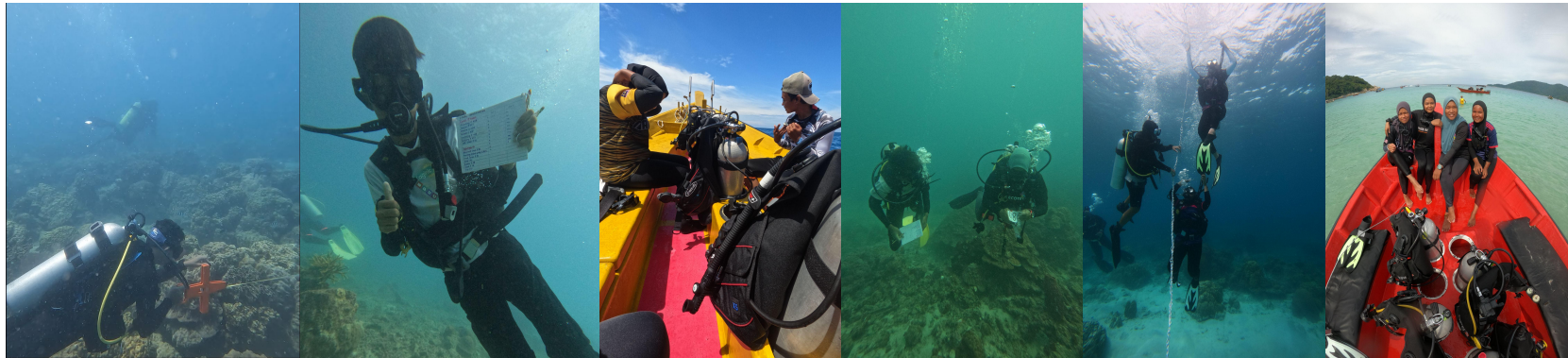
Safety bouyline & mooring line installation



Coral Restoration Project



Recruitment & Training



Dive and Research Equipment



Dive house renovation



THANK YOU



PMRS
PERHENTIAN
MARINE RESEARCH
STATION



 **Dive⁺**
@reringgit



PERHENTIAN
MARINE RESEARCH STATION

