

MALAYSIA'S CORAL REEF LONG-TERM MONITORING AND MANAGEMENT PROGRAMS

BY:

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DEPARTMENT OF FISHERIES MALAYSIA
MINISTRY OF AGRICULTURE AND FOOD SECURITY

Coral Reef in Malaysia

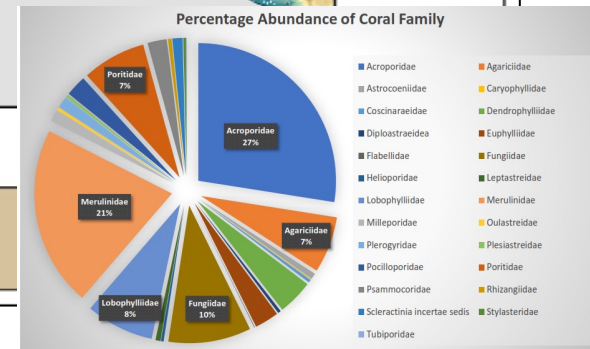
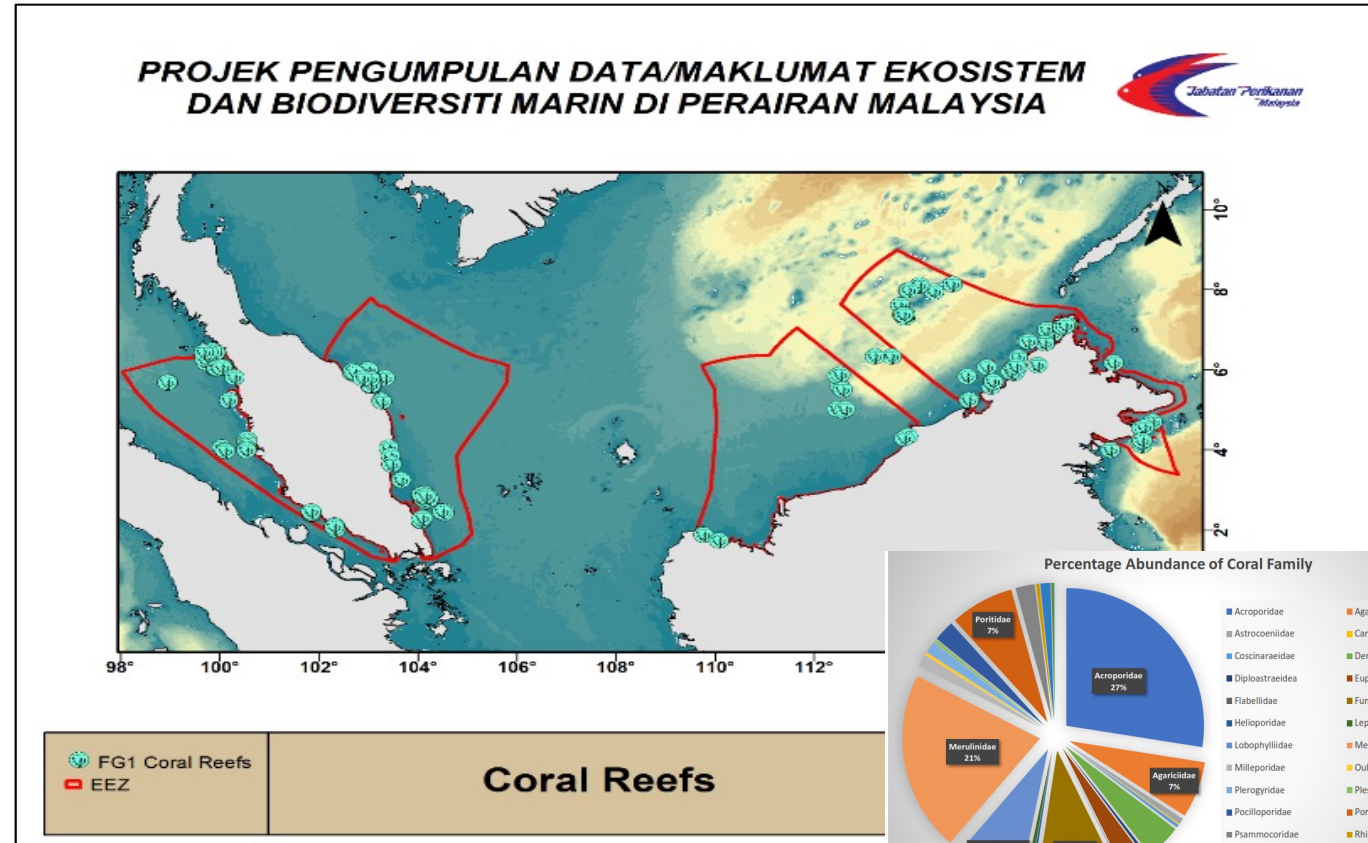
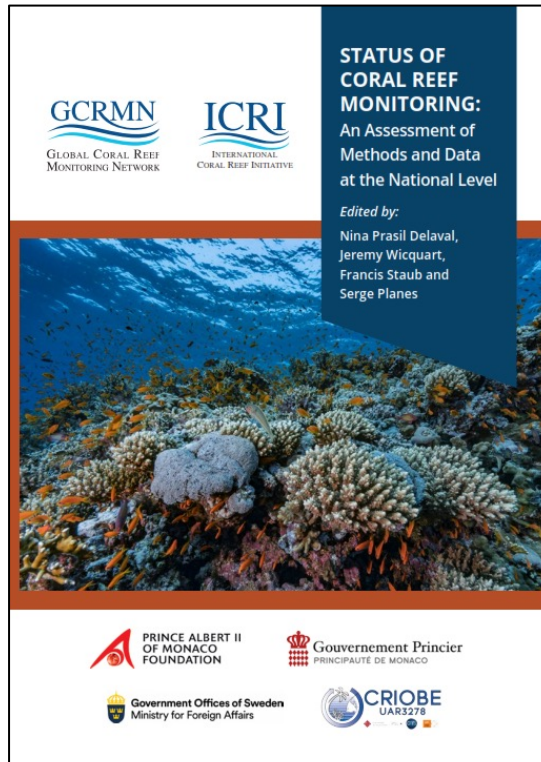


Figure 4. Pie chart illustrating the percentage composition of family classification of coral recorded in Malaysia.

CORAL REEF CARD:

Estimated Area: 3,383 km²

Proportion of the world's coral reefs: 1.284%

Ranking based of the reef area: 18th

- Based on 227 publications:
 - 25 Family
 - 572 Hard Coral Species
 - Acroporidae (27.48%), Merulinidae (21.16%) and Fungiidae (9.71%).

Introduction: Annual Coral Reef Survey

Long Term Monitoring Program for Coral Reef using the reef check survey method

Collaboration between Dept and Reef Check Malaysia since 2007

To date, 16 years of data on live coral cover

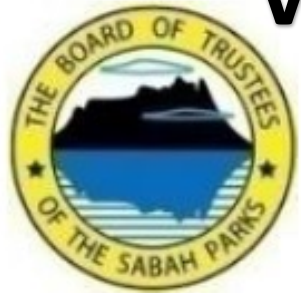
Sustainability of the program: collaboration with authority agencies, NGOs and volunteers (local communities civil society): CITIZEN SCIENCE

174 sites in Marine Park/ FPA from a total of 326 sites in Malaysia for 2023.

CITIZEN SCIENCE-BASED MONITORING PROGRAM WHICH ENSURES SUSTAINABILITY



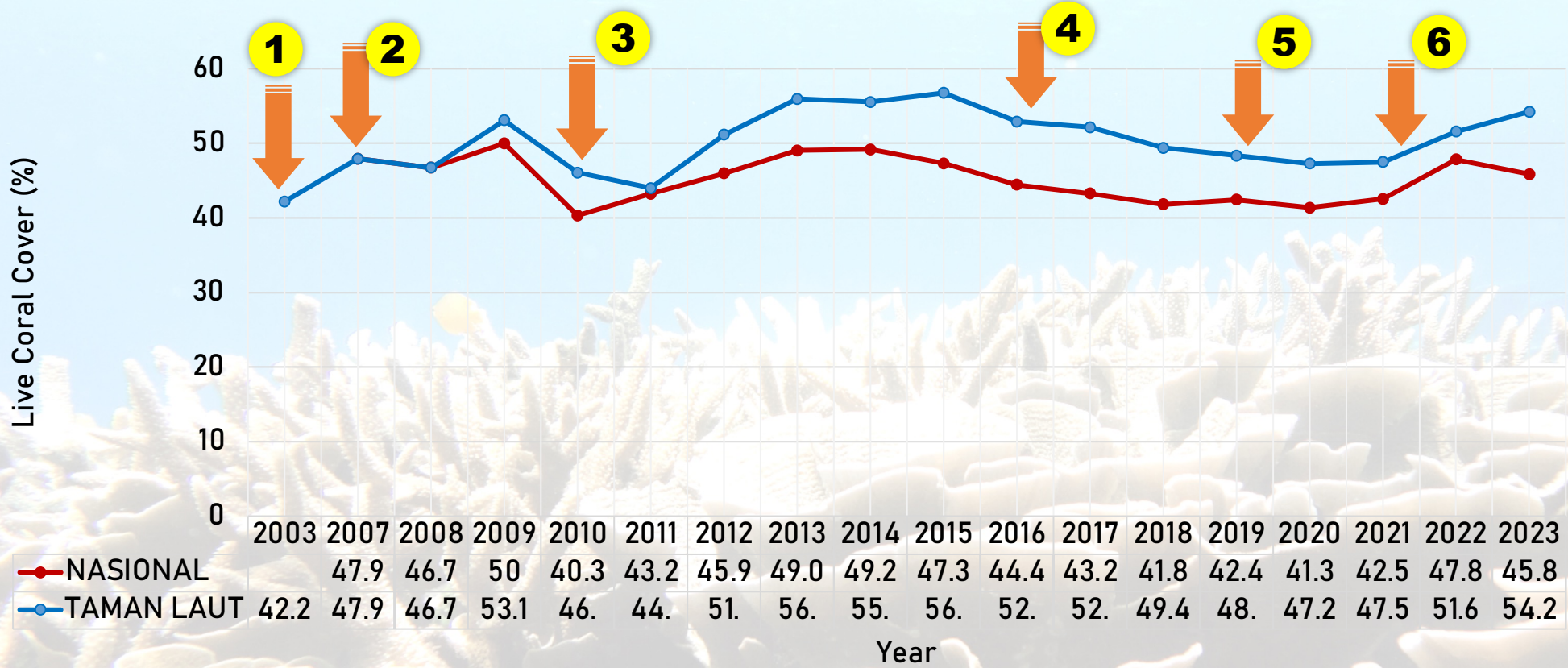
Eco-Diver Partners and Volunteers



- Total **326** sites
 - 161: Sunda Shelf
 - 23: SOM
 - 142: North Borneo



Result & Analysis: Marine Park Coral Reef Status



MALAYSIA REEFS AND ISLANDS CONSERVATION PROJECT 2003
REPORT OF THE MARINE PILOT PHASE

A COLLABORATIVE PROJECT BETWEEN THE MARINE PARKS SECTION,
DEPARTMENT OF FISHERIES, GOVERNMENT OF MALAYSIA
AND CORAL CAY CONSERVATION.



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Department of Fisheries Malaysia

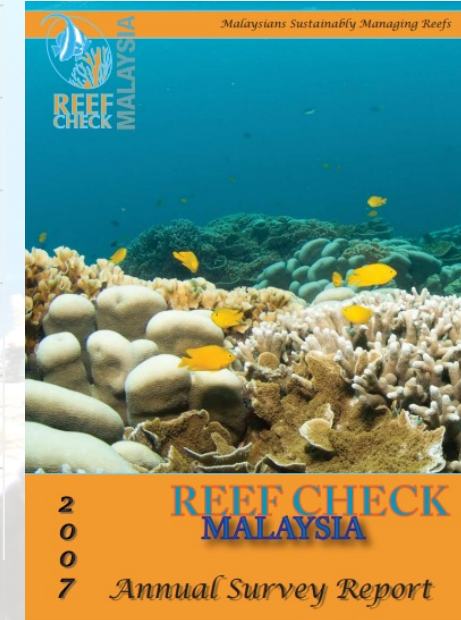
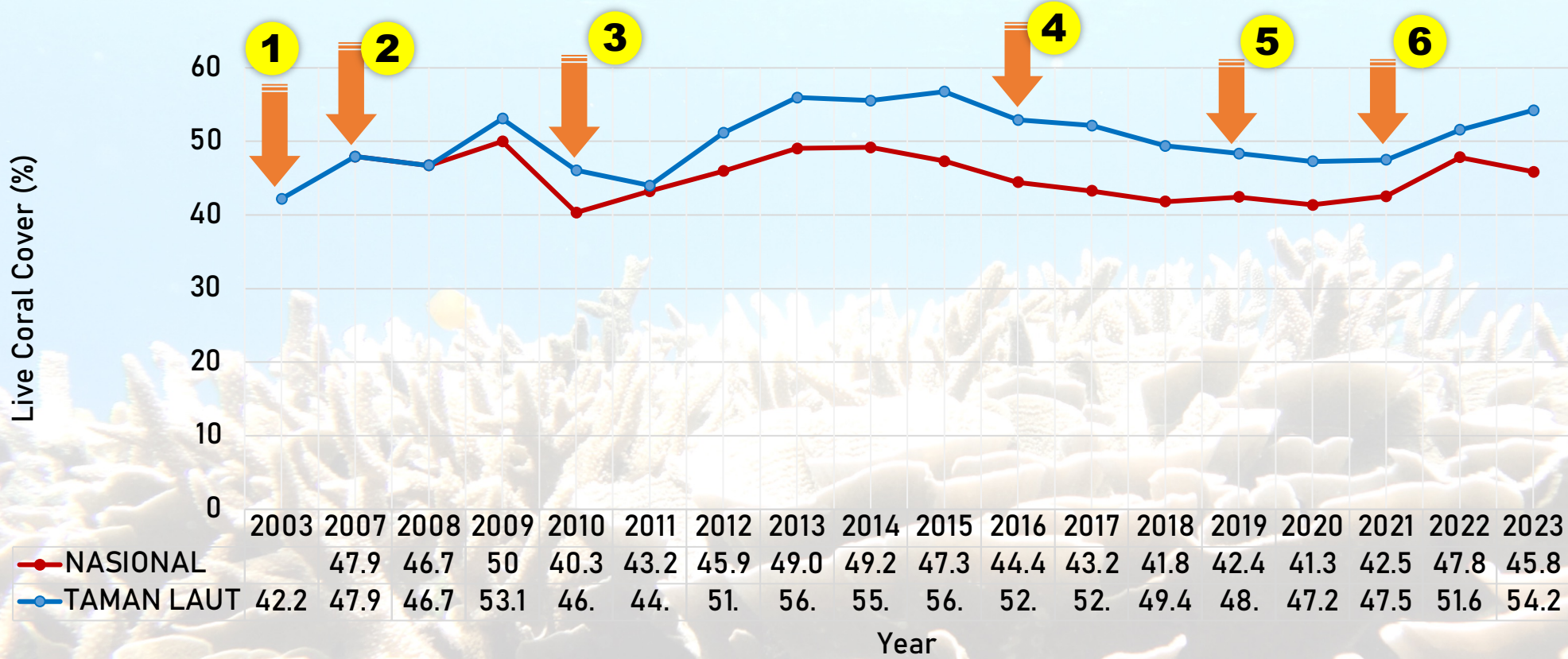
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CORAL CAY CONSERVATION
Expeditions

1

- Preliminary data/ Baseline data for coral reef status in Marine Park Island
- The surveys were conducted by Coral Cay Conservation (CCC) in 2003

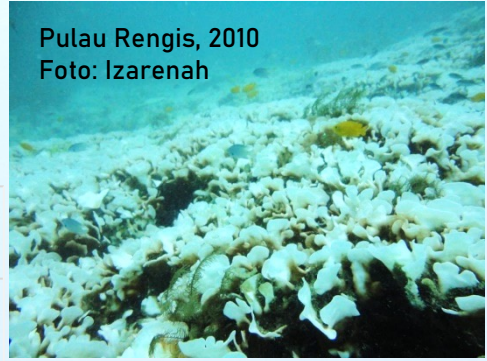
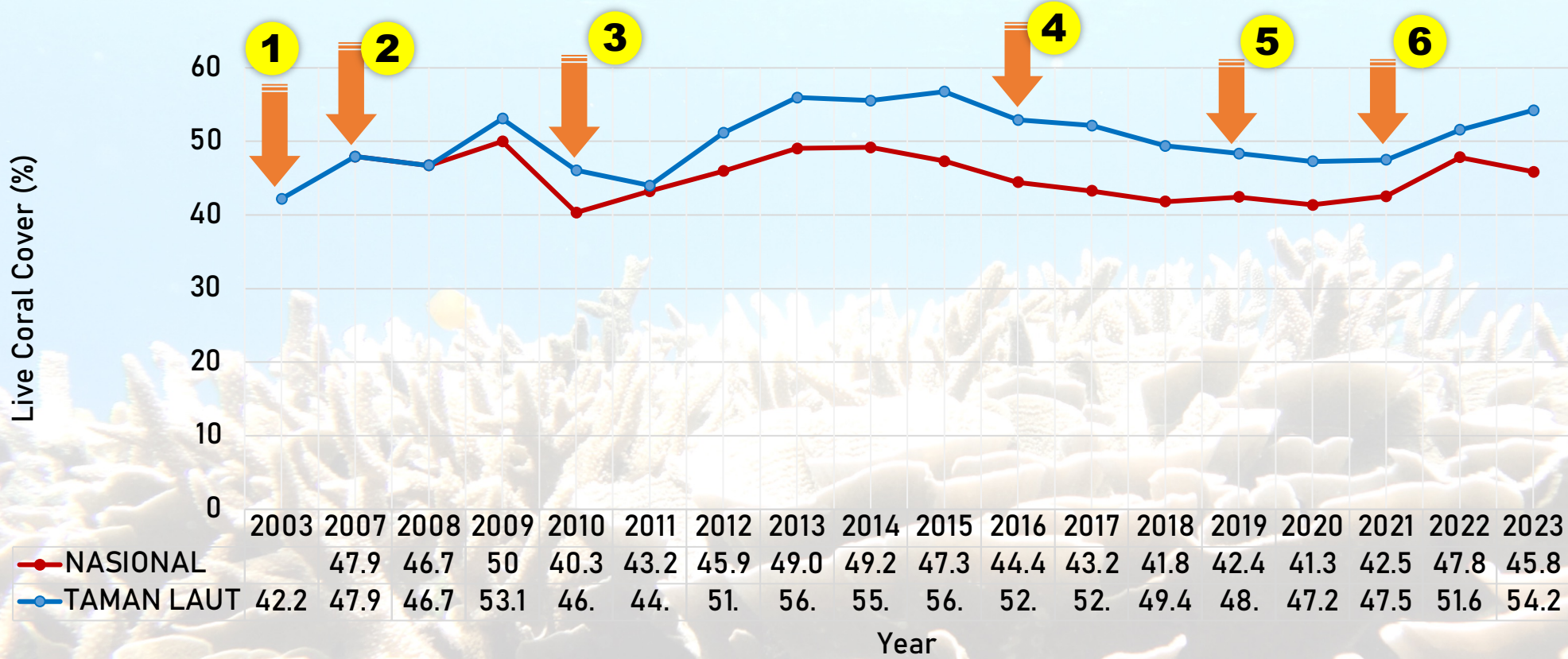
Result & Analysis: Marine Park Coral Reef Status



2

- Reef Check Annual Coral Reef Program started in 2007.
- All the survey sites were in Marine Park Island: Perhentian, Redang, Tenggol and Tioman (21 sites).

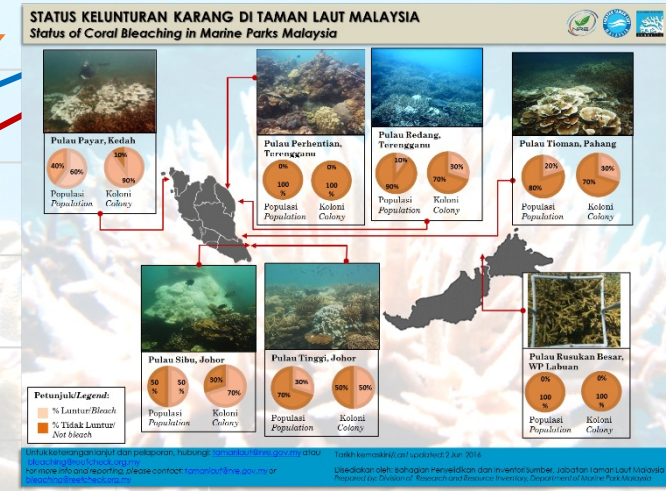
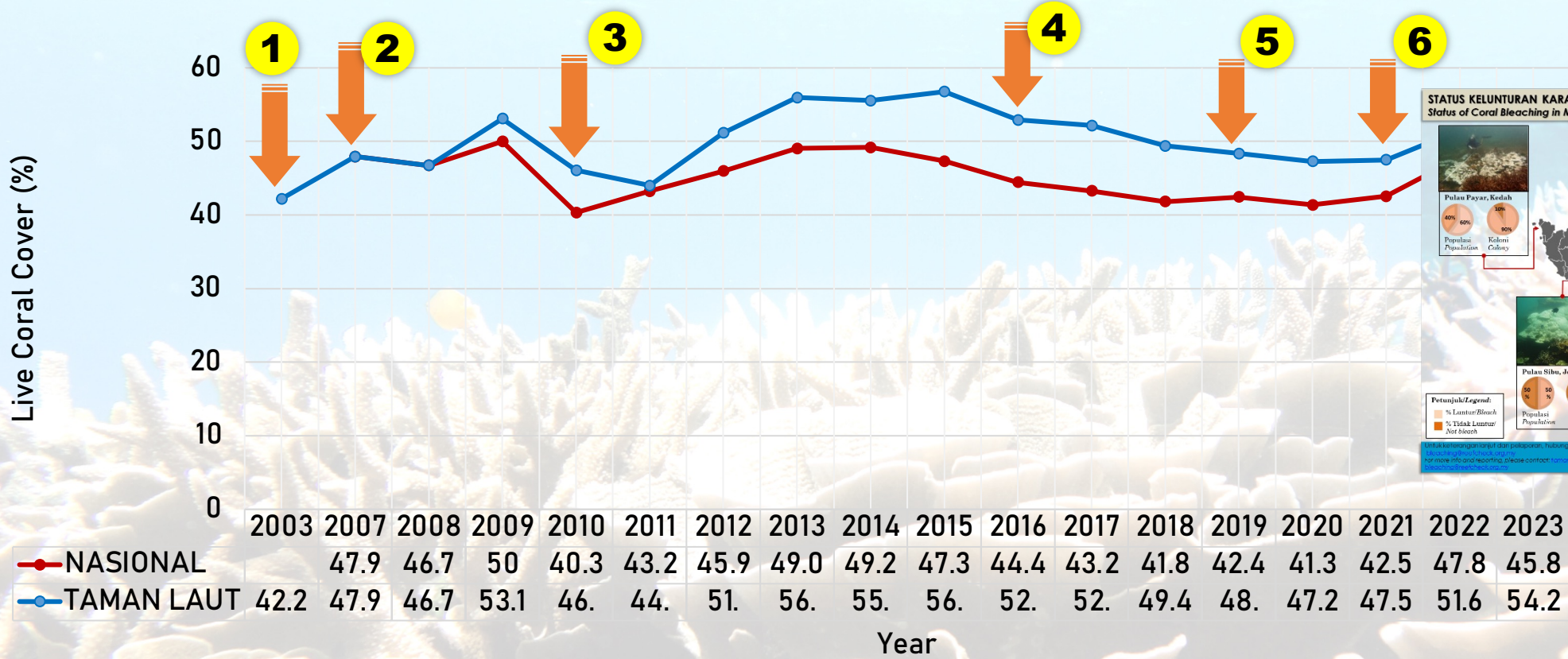
Result & Analysis: Marine Park Coral Reef Status



3

- 2nd mass coral bleaching event recorded after 1998/1999.
- Level percentage of damage/destruction: 5% - 10%.
- 12 out of 83 diving sites in Marine Park were closed for 10 months.

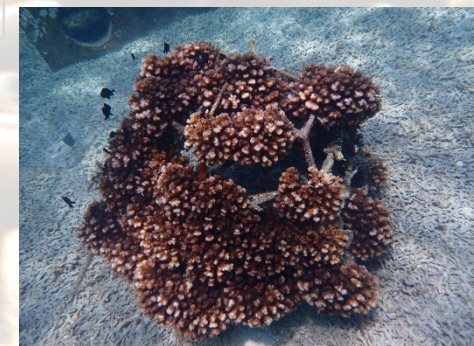
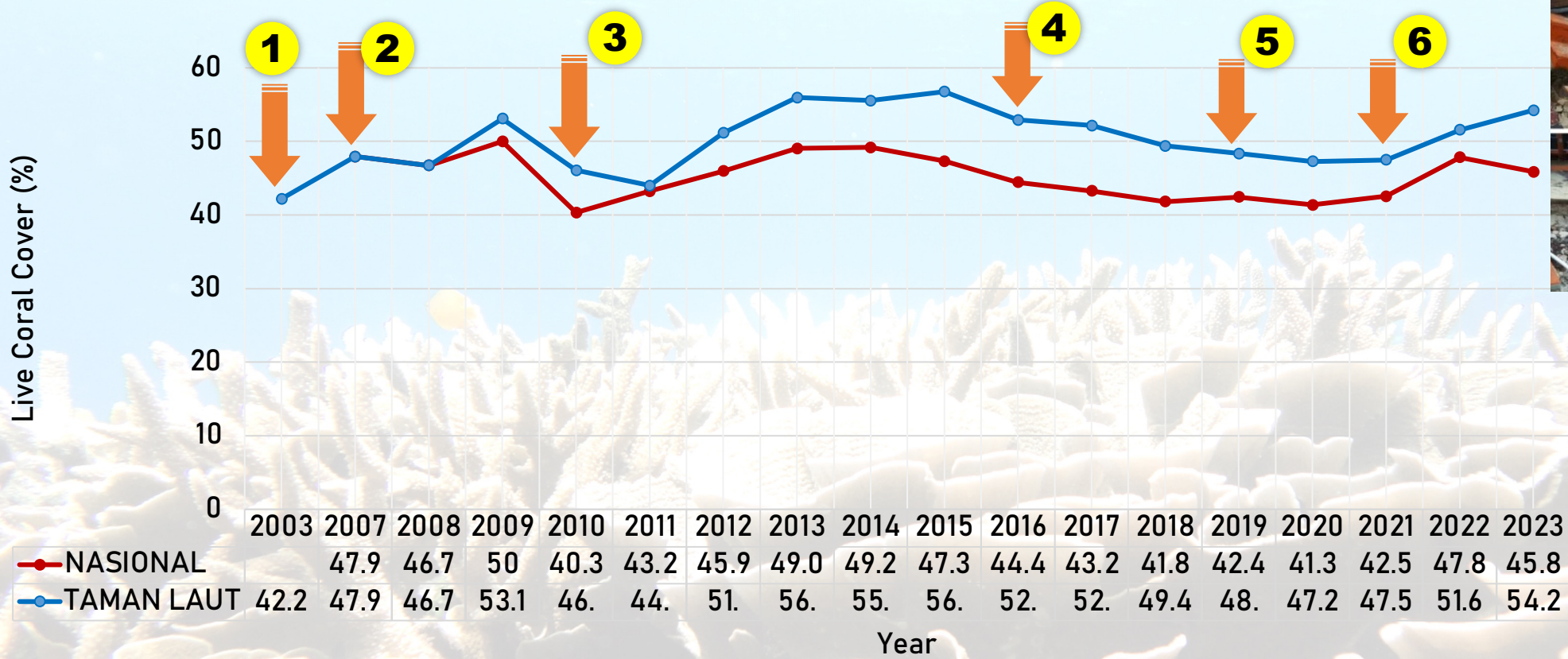
Result & Analysis: Marine Park Coral Reef Status



4

- Localized coral bleaching affecting a few sites within Marine Park.
- Most affected areas were Pulau Payar, Kedah and Pulau Sibul-Tinggi, Johor (30-50% bleached).

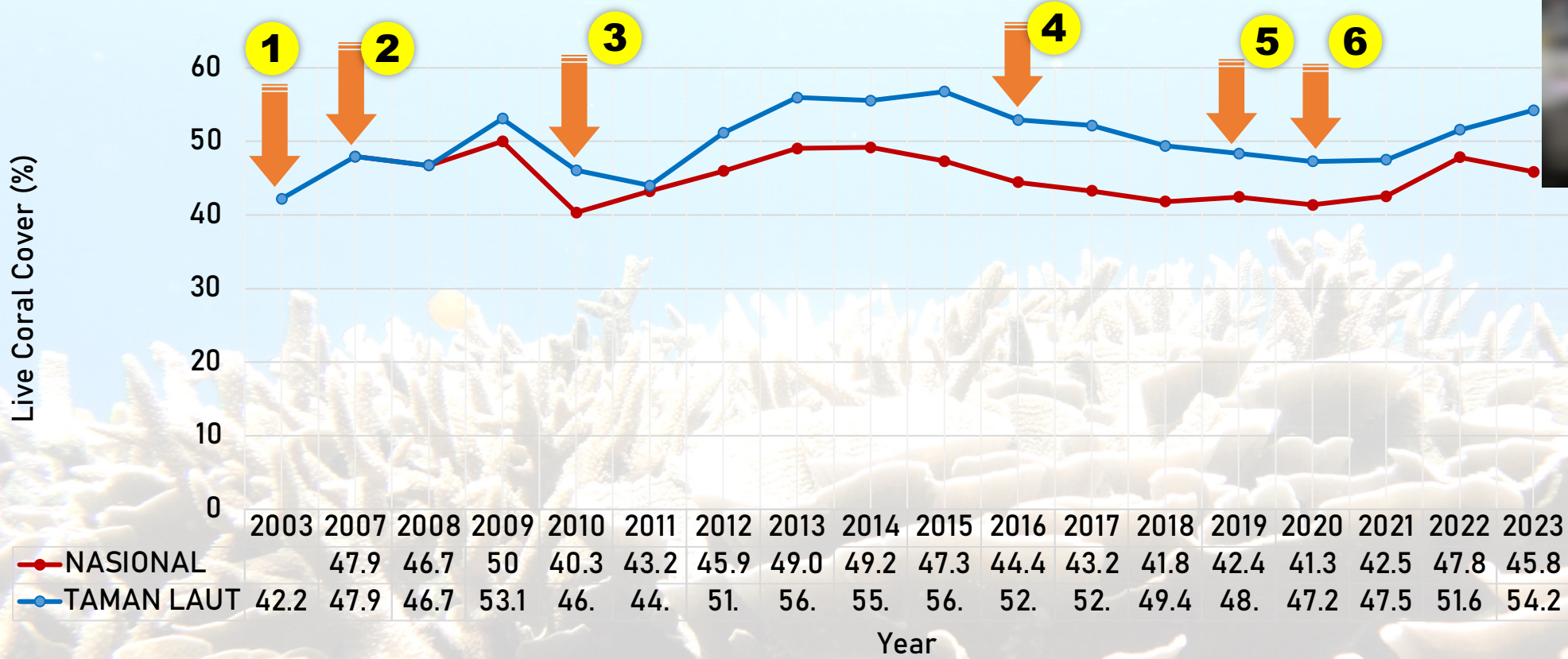
Result & Analysis: Marine Park Coral Reef Status



5

- On January 4, 2019, the Pabuk storm was reported hit the waters of the South China Sea including islands in State of Terengganu.

Result & Analysis: Marine Park Coral Reef Status



6

- The Movement Control Order (MCO/ PKP) was enforced nationwide in March 2020 until 2022.
- With no tourism activities in marine park islands, the coral reef habitat shows a slight increase in % of Live Coral Cover.

2024 Coral Bleaching Management Intervention



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Rujukan kami : Prk.ML.630-3/2 Jld 3 (23)

Tarikh : 1 April 2024

SENARAI SEPERTI EDARAN

Tuan/Puan,

AMARAN AWAL KELUNTURAN KARANG DAN PENINGKATAN TAHAP PEMANTAUAN

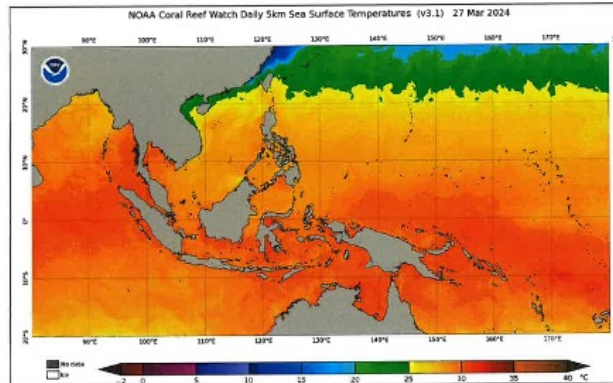
Adalah saya dengan segala hormatnya merujuk kepada perkara di atas.

2. Untuk makluman tuan/puan, berdasarkan kepada data kualiti air yang diceraip oleh Stesen Tetap Kualiti Air Taman Laut di Pulau Redang dan Pulau Perhentian, Terengganu, dan Pulau Payar, Kedah telah menunjukkan bacaan suhu air yang meningkat melebihi tahap normal suhu air laut iaitu antara 30 hingga 34°C (Lampiran 1: Pencerapan suhu oleh NOAA dan Lampiran 2: Data Suhu dari Sistem Pemantauan Kualiti Air DOF).

3. Adalah dikhawatiri dengan peningkatan suhu pada tahap ini akan menyebabkan kejadian kelunturan karang 'coral bleaching' dimana algae simbiotik, iaitu zooxanthellae yang hidup pada polip karang dan berfungsi memberi pigmen warna dan nutrien kepada karang keluar daripada polip karang atau mati. Ini menjadikan karang berwarna putih iaitu warna rangka asal karang. Pendedahan terumbu karang kepada suhu air laut yang tinggi secara berterusan selama lebih daripada 8 minggu akan menyebabkan kematian terumbu karang.

4. Sehubungan dengan itu, adalah dipohon pihak tuan/puan untuk meningkatkan tahap pemantauan dan pemerhatian bagi mengesan kejadian kelunturan karang.

LAMPIRAN 1



Rajah: Pencerapan Suhu permukaan air laut oleh pihak NOAA pada 27 Mac 2024.

Ringkasan Laporan Status Kualiti Air dari Stesen Pemantauan Kualiti Air Taman Laut Pulau Redang, Terengganu

Parameter	pH	DO Con. (mg/L)	SALINITY (ppt)	TEMPERATURE (°C)	TURBIDITY (NTU)
Min	0	4.95	13.02	30.55	0.31
Mean	0	6.237	31.271	33.171	1.331
Median	0	6.31	31.28	33.18	1.3
Max	0	8.12	31.47	35.81	3.62
Standard Deviation	0	0.338	0.356	1.046	0.317
25th Percentile	0	6.02	31.22	32.37	1.1
75th Percentile	0	6.45	31.33	33.96	1.52
90th Percentile	0	6.58	31.37	34.5	1.682

PERIKAMAN PRODUKTIF MENJANA TRANSFORMASI
 PRODUCTIVE FISHERIES TOWARDS TRANSFORMATION



LAMPIRAN 2

FOLDER GOOGLE DRIVE
 BAGI BORANG DAN KERTAS FAKTA KELUNTURAN KARANG



atau

<https://tinyurl.com/yavf9vm7>

Nota:

- Folder ini akan dikemaskini oleh pihak Urusetia CKEB, BKOPP dari masa kesemasa mengenai maklumat Kelunturan Karang.

PERIKAMAN PRODUKTIF MENJANA TRANSFORMASI
 PRODUCTIVE FISHERIES TOWARDS TRANSFORMATION



2024 Coral Bleaching Management Intervention



JABATAN PERIKANAN MALAYSIA
KEMENTERIAN PERTANIAN DAN KETERJAMINAN MAKANAN
 Department of Fisheries Malaysia
 Ministry of Agriculture and Food Security
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No. Ruj.: PRK.ML.11/02/09-1/1(126)

KENYATAAN MEDIA

KELUNTURAN KARANG DI MALAYSIA: STATUS SEMASA DAN INTERVENSI OLEH DOF

Kelunturan karang merupakan ancaman besar kepada kesihatan terumbu karang, dengan implikasi serius terhadap biodiversiti marin, perikanan terumbu karang dan pelancongan di Malaysia. Menurut US National Oceanic and Atmospheric Administration (NOAA) dan International Coral Reef Initiative (ICRI), dunia kini sedang mengalami peristiwa kelunturan karang global keempatnya iaitu yang kedua dalam dekad yang lalu.

Memahami Kelunturan Karang

Kelunturan karang adalah tindak balas semula jadi karang terhadap tekanan alam sekitar. Apabila terkekan, batu karang mengeluarkan alga mikroskopik, dipanggil zooxanthellae, yang hidup dalam tisu mereka dan yang memberikan karang sebahagian besar makanan dan warna cerah. Pengusiran ini menyebabkan batu karang menjadi putih, memberikan mereka rupa yang "luntur". Kelunturan secara besar-besaran merujuk kepada kelunturan berskala besar pelbagai spesies karang di kawasan yang luas, selalunya disebabkan oleh kenaikan suhu air laut yang melebihi paras purata normal suhu tahunan dan dalam tempoh berpanjangan. Di Malaysia, peristiwa kelunturan yang ketara berlaku pada tahun 1998, 2004, 2010, dan 2014-2016. Berdasarkan suhu air laut global, kelunturan karang dijangka menjadi lebih kerap pada tahun-tahun akan datang.

Kepentingan Ekonomi dan Ekologi Terumbu Karang

Terumbu karang ialah ekosistem penting, menyediakan habitat dan tempat pembiakan sehingga satu pertiga daripada nilai ekonomi Taman Laut berjumlah RM 8.7 bilion

Situasi Semasa di Malaysia

Sejak awal tahun ini, NOAA telah mengeluarkan pemberitahuan 'Bleaching Watch' untuk Malaysia, yang menunjukkan suhu permukaan laut melebihi purata dan potensi tekanan terma pada terumbu karang. Sebagai tindak balas, Jabatan Perikanan Malaysia (DOF) mengeluarkan amaran pada 1 April 2024, kepada semua Pejabat Perikanan Negeri untuk memantau keadaan terumbu dan melaporkan tanda-tanda kelunturan karang Dengan bantuan dan laporan yang diterima oleh DOF daripada NGO tempatan, operator selam



TARIKH	MEDIA	RUANGAN	MUKA SURAT
24/6/2024	UTUSAN MALAYSIA	DALAM NEGERI	4

Suhu laut naik, terumbu karang negara alami kelunturan teruk

PETALING JAYA: Jabatan Perikanan Malaysia (DOF) mengesahkan terumbu karang di negara ini sedang mengalami kelunturan besar-besaran. DOF memaklumkan, tinjauan yang dijalankan dari April hingga Jun lebih 50 peratus terumbu karang, khususnya di Kepulauan Taman Laut terjejas oleh kelunturan akibat peningkatan suhu permukaan laut. Katanya, ia melibatkan Pulau Payar (Kedah), Pulau Perhentian, Pulau Redang, Pulau Tenggol (Terengganu), Pulau Tioman (Pa-

terjejas berada di perairan cetek kurang daripada 10 meter. Tapak ini sedang dipantau rapi oleh DOF dan pelbagai pihak untuk mengesan perubahan dalam situasi kelunturan. "DOF juga telah bekerjasama dengan wakil dari Sabah, dan Sarawak, penyelidik tempatan dan pertubuhan bukan kerajaan (NGO) untuk menubuhkan Malaysia Coral Bleaching Response Committee (MCBRC) bagi mengumpul maklumat dan mengambil tindakan terhadap kelunturan karang. "Jika kelunturan melebihi 80

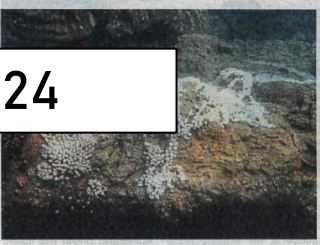
masuk sekatan akses sementara untuk melindungi terumbu yang terjejas," katanya dalam satu kenyataan. Terdahulu, sejak awal tahun ini, US National Oceanic and Atmospheric Administration (NOAA) telah mengeluarkan pemberitahuan "Tinjauan Pelunturan" untuk Malaysia, yang menunjukkan suhu permukaan laut melebihi purata dan potensi tekanan terma pada terumbu karang. Sebagai tindak balas, DOF mengeluarkan amaran pada 1 April lalu, kepada semua Pejabat Perikanan Negeri untuk memantau

TARIKH	MEDIA	RUANGAN	MUKA SURAT
24/6/2024	THE STAR	NATION	6

'Many reefs hit by coral bleaching'

Higher sea surface temperatures affect marine park islands, says Fisheries Dept

PETALING JAYA: Over half of the coral reefs in Malaysian waters have been affected by coral bleaching between April



Sad state: A dying coral will usually turn white and is a sign of bleaching caused by the rising ocean temperature, as seen in this file photo.

and Pulau Penanggi (Johor). "This is due to the increased sea surface temperatures. Most affected reefs are in shallow waters less than 10m deep. These sites are being closely monitored to track changes in the bleaching situation," the department said in a statement. Reports from dive operators, divers and surveys by NGOs such as Reef Check Malaysia confirm mass bleaching, it added. Early this year, the US National Oceanic and Atmospheric Administration issued a "bleaching Watch" notification for Malaysia.

Pulau Tioman (Pahang), and Pulau Penanggi (Johor). "This is due to the increased sea surface temperatures. Most affected reefs are in shallow waters less than 10m deep. These sites are being closely monitored to track changes in the bleaching situation," the department said in a statement. Reports from dive operators, divers and surveys by NGOs such as Reef Check Malaysia confirm mass bleaching, it added. Early this year, the US National Oceanic and Atmospheric Administration issued a "bleaching Watch" notification for Malaysia.

ment urges all parties to report any sightings of coral bleaching. "The department has also collaborated with representatives from Sabah and Sarawak, local researchers and NGOs to establish the Malaysia Coral Bleaching Response Committee to gather information and take action against coral bleaching," it said, while also urging all parties, especially in the tourism sector, to mitigate the effects of coral bleaching. "Tourist operators on marine park islands are encouraged to control the number of tourists engaging in water activities to reduce pressure on the reefs. "Tourists should avoid overcrowded areas, reduce single-use plastics, properly dispose of waste and report sightings of coral bleaching to the department or relevant authorities," it added. If bleaching exceeds 80%, interventions like temporary access restrictions may be implemented to protect affected reefs, it said. "The department assures all stakeholders that, as far as possible, disruption to tourism activities caused by these management interventions will be minimised. "The goal is simply to reduce stress caused to the already weakened reefs and ensure their survival in the future," it said. Coral reefs are vital ecosystems, providing habitats and breeding grounds for up to one-third of marine species. According to a study conducted by the Fisheries Department, the economic value of marine parks, which are largely surrounded by coral reef ecosystems, amounts to RM5.7 billion per year. Coral bleaching is a natural response of corals to environmental stress, where corals expel the microscopic algae called zooxanthellae. These algae provide most of the corals' food and vibrant colour; whereby, without it, the corals turn white, giving it a bleached appearance. Mass bleaching refers to the large-scale bleaching of multiple coral species over wide areas.

Discussion of Coral Bleaching Issue in National Waters: 7 June 2024.
Attendance: BKOPP, DPS, PPN, IPP Batu Maung, IPP Bintawa, Researcher, Sarawak Forestry Corp., Reef Check Malaysia

Press Release: 24 June 2024

Coral Bleaching in Marine Park Malaysia



Feb 2024

Payar Island, Kedah



30 May 2024

Tioman Island, Pahang



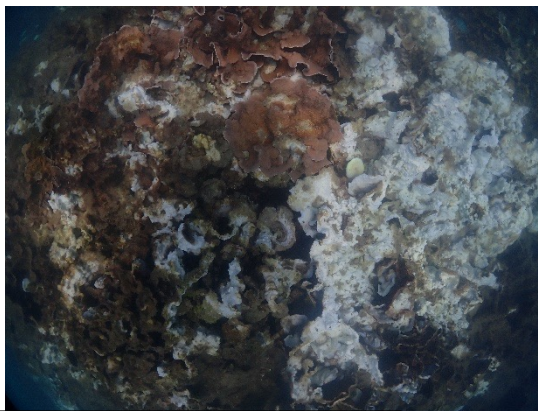
Redang Island, Terengganu



26 June 2024



9 July 2024



Perhentian Island, Terengganu

Coral Reef Management-DOF

**Annual Coral Reef
Monitoring**

**Annual Water
Quality Monitoring**

**Marine Protected
Area (MPA)**

**Marine Habitat
Mapping**

**Identifying
Potential Habitat
For Protection**

**Community
Engagement**

Research

**Habitat
Rehabilitation:
Artificial Reef &
Coral Restoration**

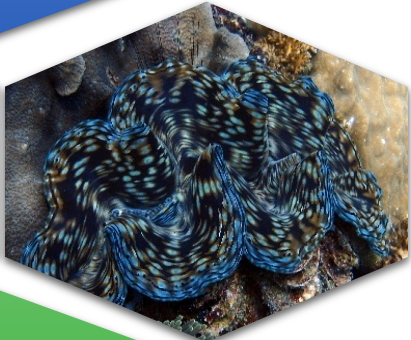
Habitat Management



**Habitat/
Species
Monitoring**

Terumbu karang
Kualiti Air
Tapak Selam
Pendaratan penyus
Spesies Ikonik

**Resources
Enhancement:
Artificial
Reef and
Coral
Restoration**

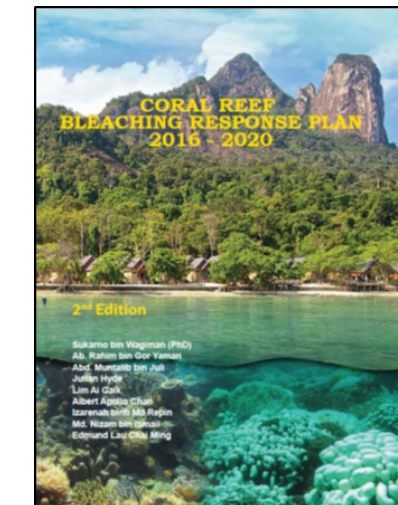


Tukun Tiruan
Restorasi karang

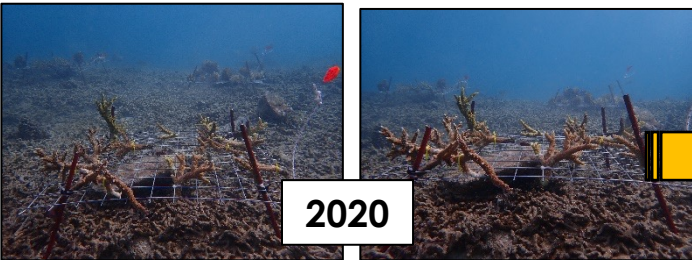
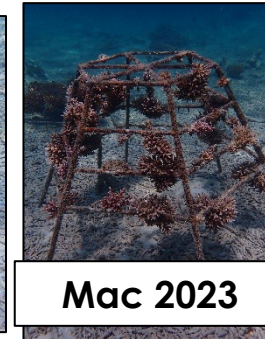
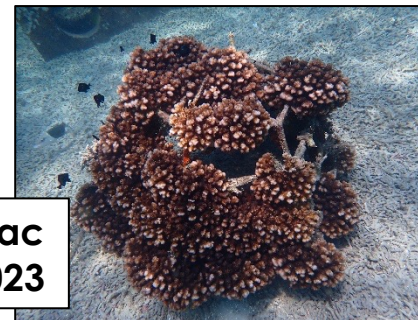
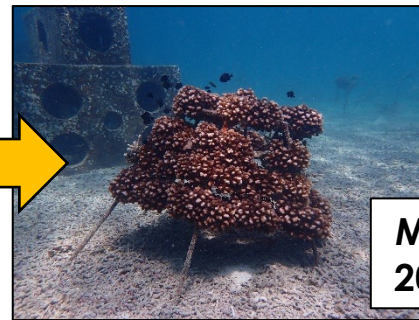
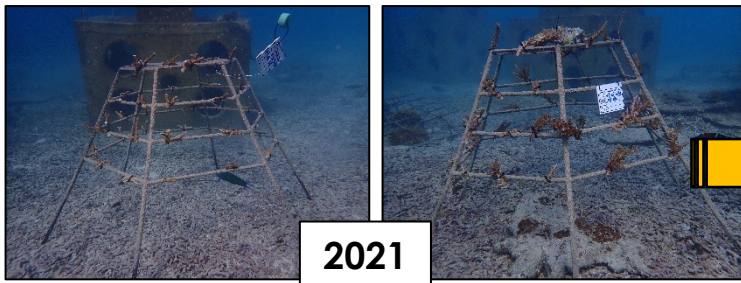
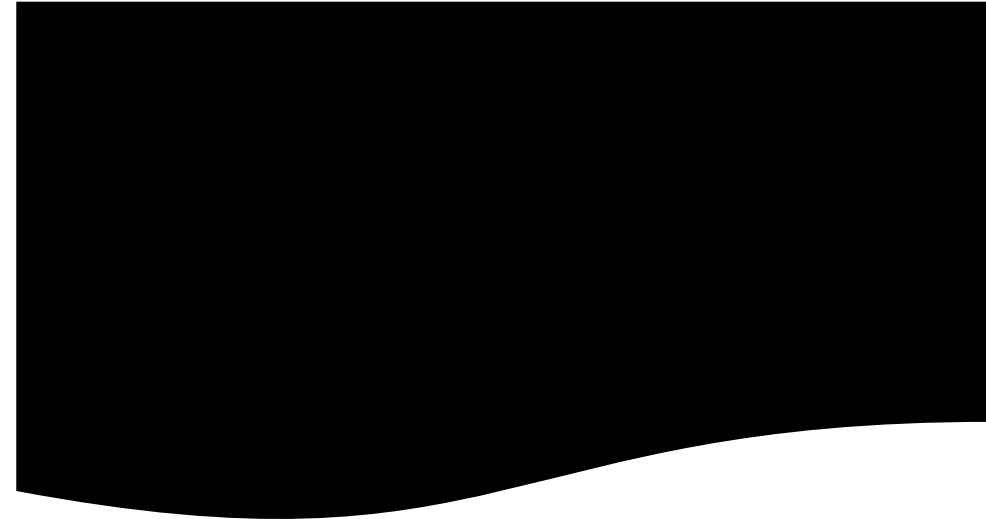
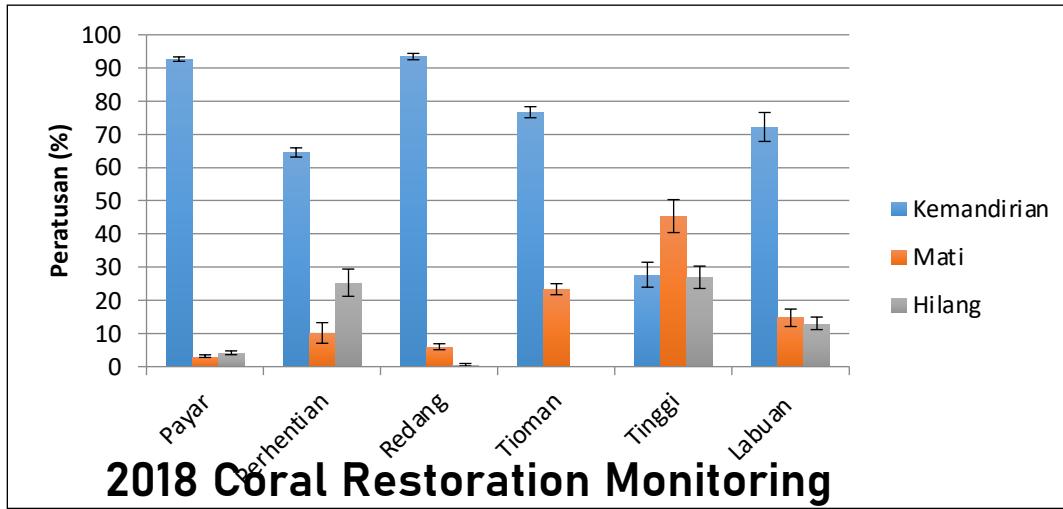


Research

Pemetaan
Ekologi/Biologi/
Oseanografi/ Sosio-
ekonomi/ Perubahan Iklim
Keberkesanan MPA



Habitat Management: Coral Restoration



Way Forward:

National

Annual Coral Reef Program

- i. Key Performance Index (KPI) DOF:
 - Target 1: 60% sites in category Fair
 - Target 2: 40% sites sites in category Good

Way Forward:

- i. Develop National Plan of Action on Coral Reef- 2025
- ii. Continue Coral Restoration Program
- iii. Revise Coral Bleaching Response Plan
- iv. Launch MyFiRSt: Malaysia Fisheries Resource System

Way Forward:



2020 UN BIODIVERSITY CONFERENCE
COP 15 - CP/MOP10 - NP/MOP4
Ecological Civilization-Building a Shared Future for All Life on Earth
KUNMING-CHINA

International

CBD: Kunming-Montreal Biodiversity Framework (KMGBF)

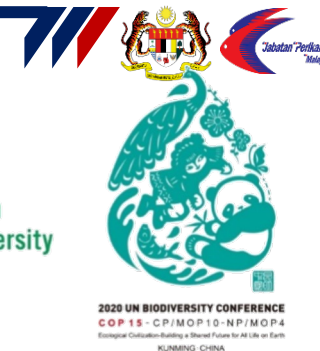
- i. Target 1: Spatial planning and retention of wilderness/intact areas
- ii. Target 2: Restoration
- iii. Target 3: Protected areas and other effective area-based conservation measure
- iv. Target 4. Conservation and recovery of species
- v. Target 7. Pollution
- vi. Target 8. Biodiversity and climate change
- vii. Target 22. Participation of IPLCs

Way Forward:

Proposed Indicators for the Kunming-Montreal Global Biodiversity Framework (Adapted from CBD/COP/DEC/15/5 Table 2)



Convention on
Biological Diversity



Goal/ Target	Headline indicator	Component indicator	Complementary indicator
A	A.1 Red List of Ecosystems	Ecosystem Intactness Index	Continuous global mangrove forest cover
	A.2 Extent of natural ecosystems	Ecosystem Integrity Index	Trends in mangrove forest fragmentation
	A.3 Red List Index	Species Habitat Index	Trends in mangrove extent
	A.4 The proportion of populations within species with an effective population size > 500	Biodiversity Habitat Index	Live coral cover
		Parc connectedness	Hard coral cover and composition
		EDGE	Global coral reef extent
		Living Planet Index	Global seagrass extent (Seagrass Cover and composition)
		Change in the extent of water-related ecosystems over time	Cover of key benthic groups
			Fleshy algae cover
			Ecosystem Intactness Index
		Biodiversity Intactness Index	
	Ocean Health Index		
	Extent of physical damage indicator to predominant seafloor habitats		
	Wetland Extent Trends Index		
	Percentage of threatened species that are improving in status according to the Red List		
	Number of threatened species by species group		
	Mean Species Abundance (MSA)		
	Species Protection Index		
	Fish abundance and biomass		
	Genetic scorecard for wild species		
	Marine species richness		
	CMS Connectivity Indicator		
	Species Status Index		



**Give a man a fish he will
eat for a day...
Teach a man to fish he
will eat for a lifetime...
Until no more fish at
sea....**

**Sekian
Terima kasih**

An underwater photograph showing a diver on the left wearing a black wetsuit and a diving mask, holding a camera. The diver is positioned near a large, colorful coral reef structure. The water is clear and blue, with several small fish swimming around. The coral has various colors including red, orange, and purple.

TERIMA KASIH
Thank You

Izarenah binti Md Repin

Fisheries Officer

Division of Fisheries Conservation and Protection

Department of Fisheries Malaysia

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DAN INDUSTRI AGAS TANAH



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