



# MARINE TURTLE ACTION PLAN FOR SABAH



2026 - 2035



SABAH WILDLIFE DEPARTMENT  
MINISTRY OF TOURISM, CULTURE AND ENVIRONMENT

# MARINE TURTLE ACTION PLAN FOR SABAH

2026-2035

In collaboration with:



The compilation and editing process of this Marine Turtle Action Plan was led by the Director of Sabah Wildlife Department and supported by relevant agencies and organisations working on marine turtle conservation in Sabah.

Published by  
Sabah Wildlife Department  
5th Floor, Block B, Wisma MUIS Complex  
88100 Kota Kinabalu  
Sabah, Malaysia

With assistance from  
WWF-Malaysia

And funding from  
Sabah Wildlife Department and WWF-Malaysia

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December 2025

Citation: Sabah Wildlife Department (2025). Marine Turtle Action Plan for Sabah 2026-2035. Sabah Wildlife Department, Ministry of Tourism Culture and Environment. Kota Kinabalu, Sabah, Malaysia.

Front cover photo:

A green turtle (*Chelonia mydas*) photographed in Lankayan Island, Sabah. © Jetji

Book content photo: © WWF-Malaysia

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ISBN 978-629-99796-4-7

Printed in Kota Kinabalu

# EXECUTIVE SUMMARY

The Marine Turtle Action Plan for Sabah 2026-2035 (MTAP) is a comprehensive document that (i) serves as a policy direction and (ii) outlines the need for immediate actions for the marine turtle conservation and management in order to ensure the long-term survival of marine turtle populations in Sabah. This document results from an extensive consultation process at the state's ministry and stakeholders' workshops at both state and district (Tun Mustapha Park, Sandakan and Semporna) levels throughout 2018 and 2019. The plan was designed based on the Project and Programme Management Standards (PPMS).

Four species of marine turtles: the green, hawksbill, olive ridley, and leatherback turtles can be generally found in Sabah. These turtles are found either nesting, foraging and migrating across Sabah. Nesting sites and foraging grounds are found at the coastal mainland and islands of both west and east coast. The major nesting sites are located on the east coast, for example the Turtle Islands Park in the Sandakan district.

Decades of long-term monitoring in Turtle Islands Park exhibits gradual decreasing trend for hawksbill turtle nesting despite the gradual increasing trend in green turtle nesting. The gradual decrease is believed to be due to the loss of the nesting beaches, bycatch in fisheries and harvesting at their foraging grounds. Status of other sites are undetermined and long-term datasets are needed for other sites to produce accurate nesting trends.

In Sabah, marine turtles are in danger due to unsustainable or destructive fishing practices, unregulated tourism practices, egg poaching and consumption, turtle poaching, improper conservation operations, impacts of climate change, unsustainable coastal development, pollution, and marine debris. Thus, any sites or turtle populations warrant protection and management.

To that end, MTAP was developed. The vision of this action plan is 'People of Sabah Living in Harmony with Marine Turtles'.



The 10-year goals of MTAP are as follows:

1. By 2035, the nesting trends of marine turtles shows an increase or stabilising trend due to increased monitoring, and
2. By 2035, critical marine turtle habitats are maintained or increasing.

To reflect on the unique biological characteristics of marine turtles, a long-term 20-year goal is also developed, which is that by 2045, the nesting trends of marine turtles in Sabah shows an increase or stabilising trend.

The achievement of the goals will be through the implementation of eight strategies. These strategies are as follows:

1. Reduce direct and indirect causes of marine turtle mortality;
2. Protect and conserve habitats;
3. Legislation and policy;
4. Community participation;
5. Enhance national, regional and international cooperation;
6. Research and monitoring;
7. Financing; and
8. Public awareness and education.

The objectives of the MTAP are as follows:

1. By 2035, marine turtle mortalities due to direct and indirect causes shows a reducing trend;
2. By 2035, identified critical marine turtle habitats are protected or effectively managed;
3. By 2035, the capacity of enforcement agencies has increased by 10 times;
4. By 2035, community-managed areas for marine turtle conservation have increased;
5. By 2035, cooperation between stakeholders at national, regional and international levels has increased;
6. By 2035, knowledge about the state of marine turtles in Sabah has improved;
7. Financial budget for MTAP is allocated annually; and
8. By 2035, awareness and education amongst public is raised.

Aside from providing a marine turtle conservation and management direction for the state, the MTAP contributes and provides synergy with existing conventions and plans, such as the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), the Memorandum of Understanding on the Conservation and Management of Marine Turtles and their Habitats of the Indian Ocean and South-East Asia (IOSEA MoU), the CTI-CFF Regional and National Plan of Action, the National Plan of Action for Conservation and Management of Sea Turtles, and the Sabah Biodiversity Strategy 2024-2034.

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# 1) INTRODUCTION

## 1.1 Species

Marine turtles (Chelonioidae) are members of the order Testudines (along with the other aquatic turtles and tortoises) and are long-lived reptiles that appeared in the late Triassic ca. 200 million years ago (Pritchard, 1997). At present, there are two families consisting of seven species of marine turtles. The 'hard-shelled' Cheloniidae family contains six extant species within five genera. They are the green (*Chelonia mydas*) (Linnaeus, 1766), the hawksbill (*Eretmochelys imbricata*) (Fitzinger, 1843); the olive Ridley (*Lepidochelys olivacea*) (Eschscholtz, 1829), the kemp's Ridley (*Lepidochelys kempii*) (Garman, 1880), the loggerhead (*Caretta caretta*) (Linnaeus, 1758) and the flatback turtles (*Natator depressus*) (Garman, 1880). The 'soft-shelled' Dermochelyidae family contain a single extant species within a single genus, which is the leatherback turtle (*Dermochelys coriacea*) (Linnaeus, 1766).

Four of the seven species can be generally found in Sabah: the green, the hawksbill, the olive Ridley, and the leatherback turtles<sup>1</sup>. The green and hawksbill turtles are commonly seen, either nesting, foraging and migrating in Sabah (Basintal, 2001; Palaniappan, 2001, Pilcher et al. 2019; Joseph et al. 2021). The olive Ridley are seen nesting (Basintal, 2001; Joseph, 2017; Joseph et al., 2021) and foraging (Pilcher et al., 2008) whereas the leatherback turtles has been observed migrating through Sabah waters (Benson et al. 2007). Sightings of leatherback turtles in Sabah waters were reported by fishermen (Palaniappan, 2001), and recreational and professional divers (David, pers. obs.). Table 1 shows the marine turtle species that can be found in Sabah.

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<sup>1</sup> Loggerhead turtles have occasionally been recorded swimming in Sabah's coastal waters (Kobayashi *et al.*, 2011), but such sightings are extremely rare. In contrast, green, hawksbill, olive ridley, and leatherback turtles are more commonly reported in Malaysia and Sabah. Therefore, this document focuses on these four species, as they are the ones generally found in Sabah.



Table 1: Marine turtle species found in Sabah.

SPECIES	COMMON NAME	MALAY NAME	NESTING	FORAGING	MIGRATING
<i>Chelonia mydas</i>	Green turtle	<i>Penyu hijau</i>	x	x	x
<i>Eretmochelys imbricata</i>	Hawksbill turtle	<i>Penyu sisik</i>	x	x	x
<i>Lepidochelys olivacea</i>	Olive Ridley turtle	<i>Penyu lipas</i>	x	x	
<i>Dermochelys coriacea</i>	Leatherback turtle	<i>Penyu belimbing</i>			x

Note: In Peninsular Malaysia, the Malay names for green and hawksbill turtles are *Penyu Agar* and *Penyu Karah*, respectively

Green turtles are widely distributed in the tropical and sub-tropical waters, usually preferring near-shore bays and continental waters (Márquez, 1990). They are known to forage on shallow seagrass beds and coral reefs (Bjorndal, 1980) and are shown to consume a wide variety of seagrass, marine algae and invertebrates (Bjorndal, 1997). The hawksbill turtles have a circum-global distribution, inhabiting tropical and to a lesser extent subtropical waters of the central Atlantic and Indo-Pacific regions (Márquez, 1990). They have been observed foraging over coral reefs and rocky substrate, seagrass beds and in mangrove-fringed bays (Bjorndal & Bolten, 1988; Bjorndal, 1997). The hawksbill turtles feed on a number of invertebrates, including corals and sponges in coral reefs (Meylan, 1988). The olive Ridley turtle is a pan-tropical species usually seen in continental coastal waters although not close to the shore (Márquez, 1990). Several reports suggest that the species has an omnivorous diet and feeding mainly on Gastropoda and Malacostraca (Conway, 1994; Limpus, 2008). The leatherback turtles are the most widely distributed species, known to occupy tropical to subpolar waters (Márquez, 1990). Leatherback turtles feed primarily on gelatinous zooplankton mostly of the phylum Cnidaria, class Scyphozoa (i.e. true jellies) (Iverson & Yoshida, 1956; Bjorndal, 1997; Salmon et al., 2004).

## 1.2 Key life history adaptations

Marine turtles are air-breathing animals that spend almost all of their life in the sea and possess unique physical and biological characteristics.

### Physical characteristics

- Extensive roofed skulls, unretractable neck as opposed to their terrestrials' families, domed-shaped carapace and plastron made of keratine scutes;
- Streamlined body with both fore- and hind limbs converted to paddle-like flippers that allows effective movement underwater;
- Breathes air, has elastic lungs and high aerobic capacity making them able to stay underwater for extended periods of time, and
- Living in the marine environment allows the turtles to be exposed to salt water, thus having salt glands enables these turtles to excrete salt from their eyes hence allowing them to be able to live in salt water without having to drink water.

### Biological characteristics

- Require several decades to mature sexually depending on species. Hatchlings emerging today might only return to nest after at least 19-20 years. For this reason, effects on long-term survival such as egg and adult poaching might not be observed based on a short number of years;
- The embryonic development inside the eggs starts immediately after laying by females at the beach;
- Has a sex ratio of hatchlings that is temperature dependent. Warmer temperatures produce more females while cooler temperatures produce more males;
- Hatchlings exhibit frantic swim commonly known as the 'swimming frenzy' which lasts between 24 to 48 hours after emerging from the nest and reaching the water;
- Display ontogenetic shift in diet and habitat use during development whereby the diet variation ranges from herbivorous grazers to carnivores, and needs a wide range of habitats to complete different life-cycle stages including sandy beaches, coastal waters, seagrass beds, coral reefs and open ocean pelagic waters; hence protecting or managing marine turtles needs to take account of these habitats;
- Disperse and undertake periodic migrations over vast distances to and from their nesting (sandy beach) and foraging sites (coral reefs, seagrass beds, mangroves-fringed forests, etc.);
- Migrate to specific geographical targets showing high site fidelity or natal philopatry after remigrations;
- Female turtles do not nest annually but rather a couple of years between nesting, and
- Migrate within the territorial waters of many countries as well as the high seas.

## 1.3 Current distribution and population trends

### 1.3.1 Nesting sites

Nesting sites of green, hawksbill and olive Ridley turtles are found at the mainland and island beaches of both west and east coasts of Sabah (Jumin et al., 2008a, 2008b; Palaniappan 2001; Joseph et al., 2021; Jolis et al. 2023; Migliaccio et al., 2020). The sites are the protected Tun Mustapha Park (TMP), Sugud Island Marine Conservation Area, Turtle Islands Park and Pulau Sipadan Park, while the majority remaining sites are unprotected. The protection of the parks or conservation area is based on state's legislations i.e. Parks Enactment 1984 or the Wildlife Conservation Enactment 1997. Green turtle is the common species found nesting followed by the hawksbill with sporadic nestings of olive Ridley turtles (Basintal, 2001; Palaniappan, 2001; Joseph et al., 2021). No nestings of leatherback turtles were reported. Generally, the nesting season for green and hawksbill in Sabah is all year round, especially in the Turtle Islands Park, with different peak months for the green between May to August and the hawksbill between February to April (Joseph, 2017; Joseph et al., 2021).

The highest green nesting abundance is located at Selinga Island, followed by Bakkungan Kechil Island, Gulisaan Island, Sipadan Island Park and Lankayan Island. The highest hawksbill nesting abundance is located at Gulisaan Island, followed by Selinga Island, Bakkungan Kechil Island and Lankayan Island. The nests numbers range to thousands per year as compared to other sites in the state highlights the critical importance of these sites for both green and hawksbill turtles. Nesting abundance was recorded through established patrol and monitoring systems by various stakeholders, ranging from government agencies, private sectors, non-government organisations and community-based organisations.

Decades of long-term monitoring in Turtle Islands Park exhibits increasing trends of green turtle nestings which could be due to impacts of the conservation efforts in the park that started in the 1970s (Joseph, 2017; Joseph et al., 2021; Pilcher, 2025). However, the park exhibits a gradual decreasing trend for hawksbill nestings, which could be due to the loss of the nesting beach on Gulisaan Island (which has suffered severe beach erosion), bycatch in fisheries activities and harvesting of adult turtles at their foraging grounds (Joseph, 2017; Joseph et al., 2021). Similar increasing trend of green turtle nestings is also seen in Lankayan Island (monitoring started in 2006) (Pilcher, 2025). The period of monitoring years for other sites are insufficient for long-term analysis. Moreover, the inconsistency of efforts at these sites may not be able to warrant accurate nesting trends and may only reflect patrol efforts, hence long-term monitoring and data are needed.

Figure 1 shows the nesting biogeography of marine turtles found in Sabah with data based on recently available year. Figures 2 and 3 show the clutch abundance of nesting sites in Sulu and Celebes Seas.

# NESTING BIOGEOGRAPHY OF MARINE TURTLES IN SABAH

Data were obtained in 2019.

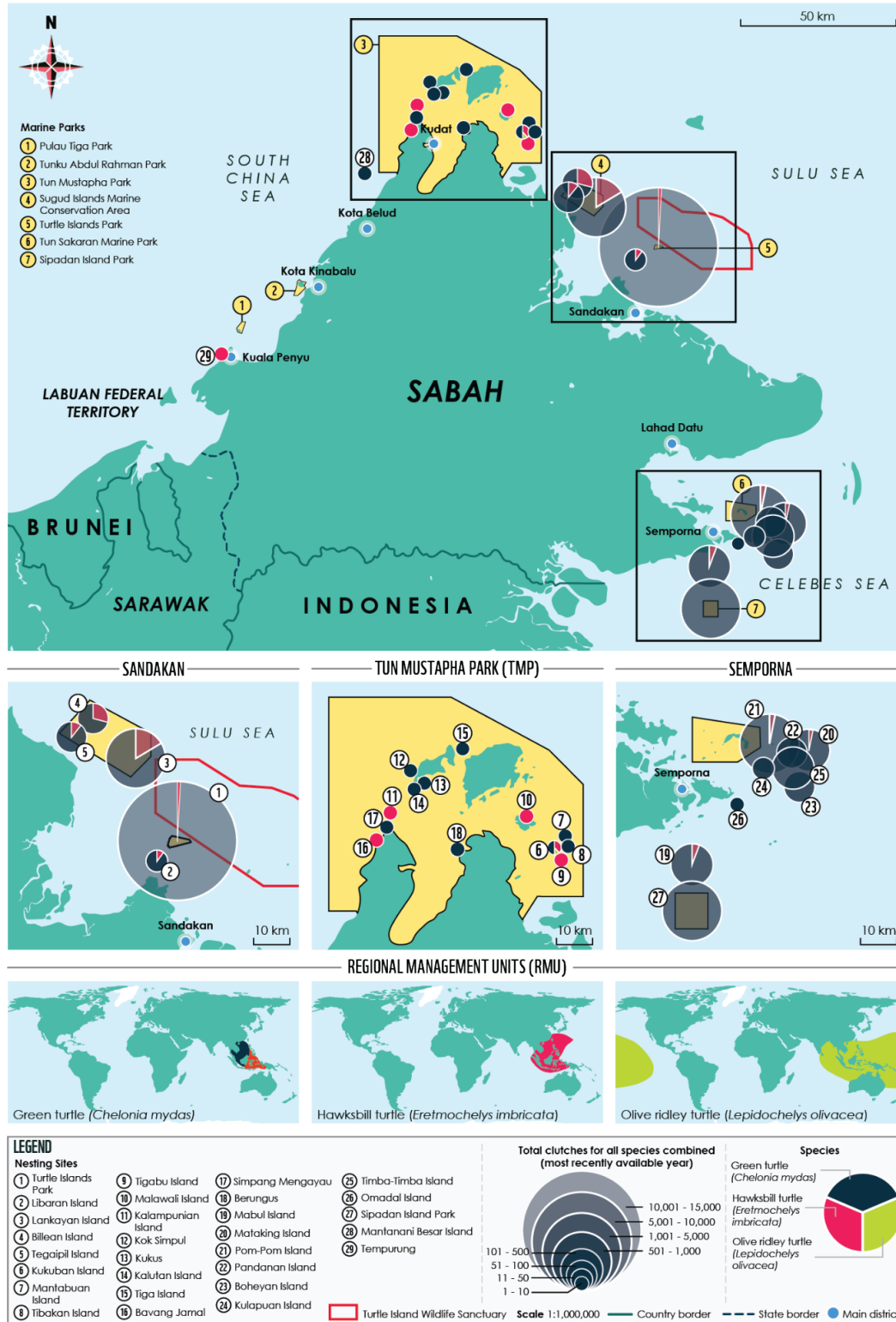


Figure 1: Nesting biogeography of marine turtles in Sabah. Regional Management Units (RMU) follows Wallace et al. (2023).

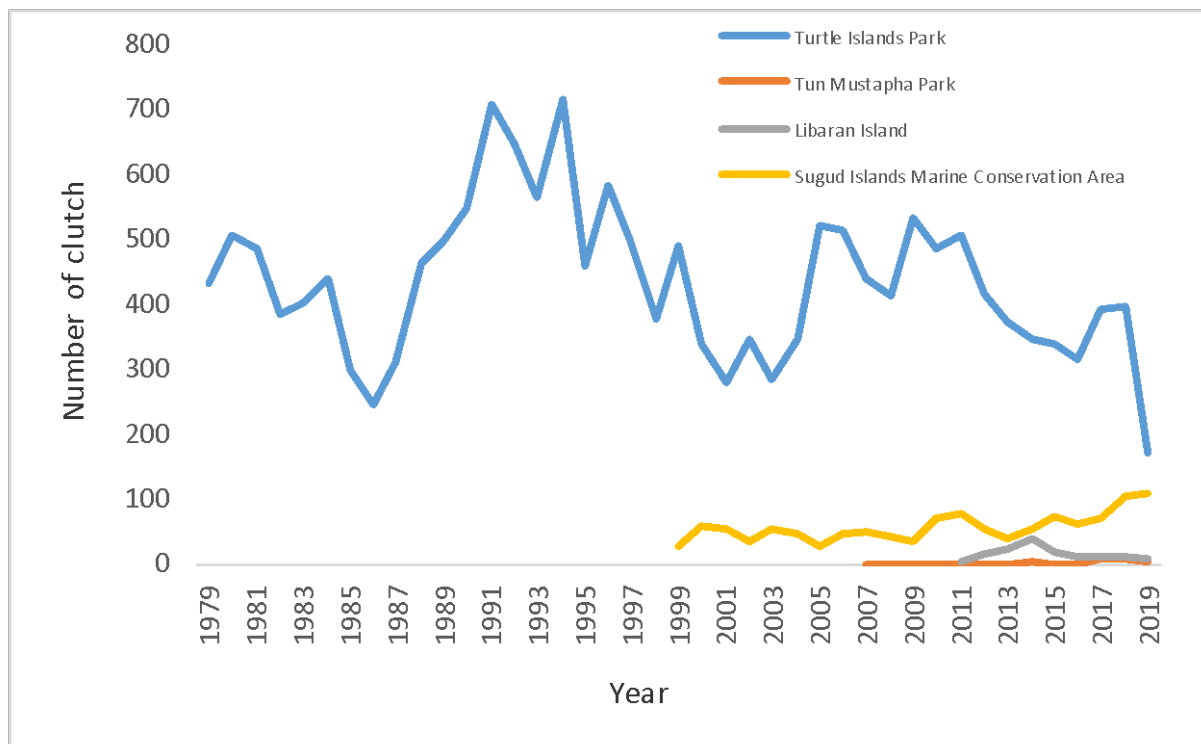
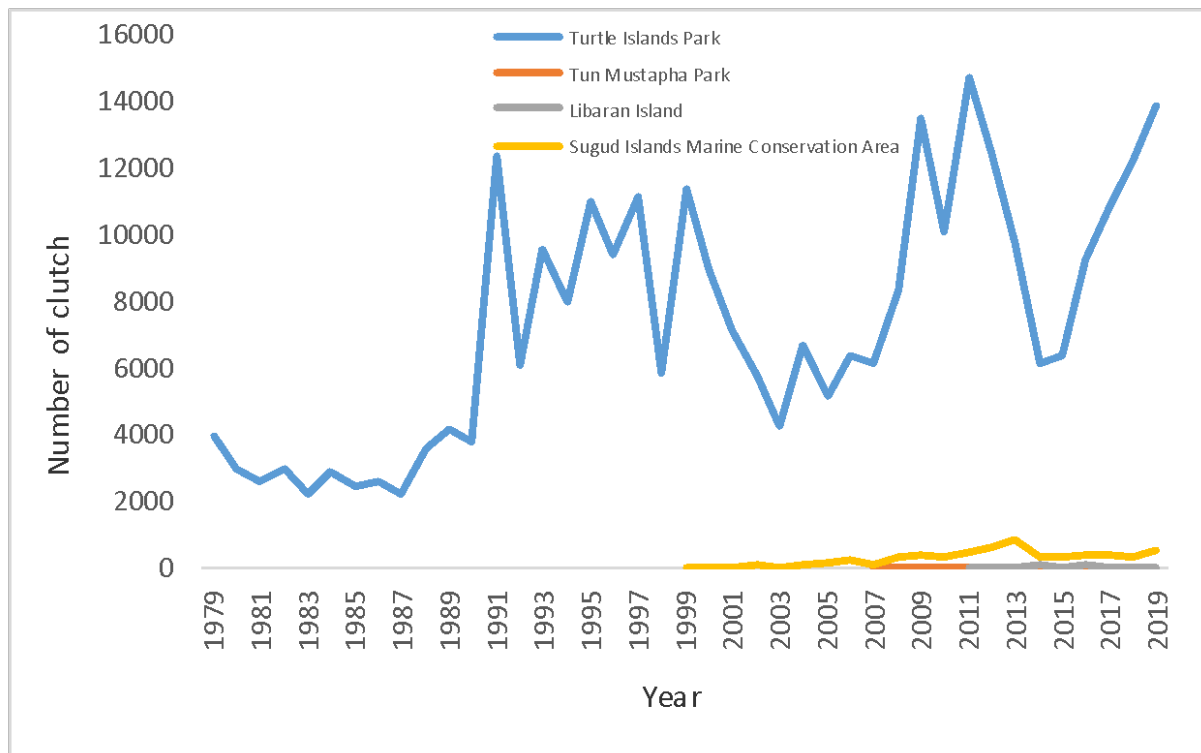


Figure 2: Green (above) and hawksbill (below) clutch abundance of nesting sites in the Sulu Sea.

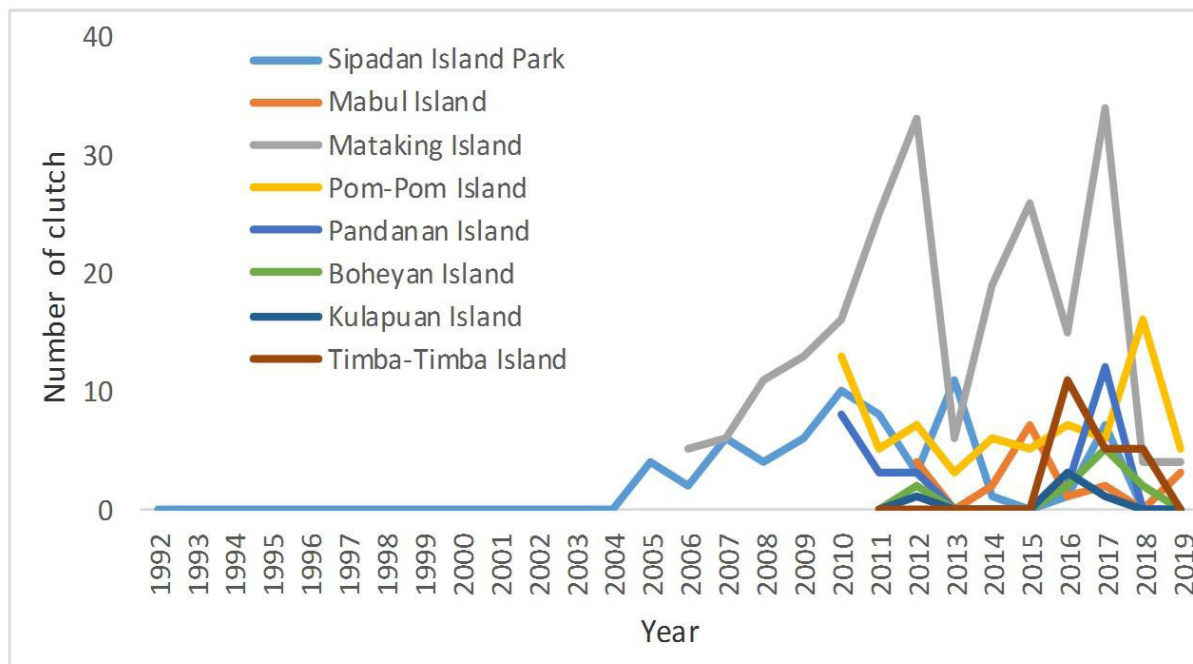
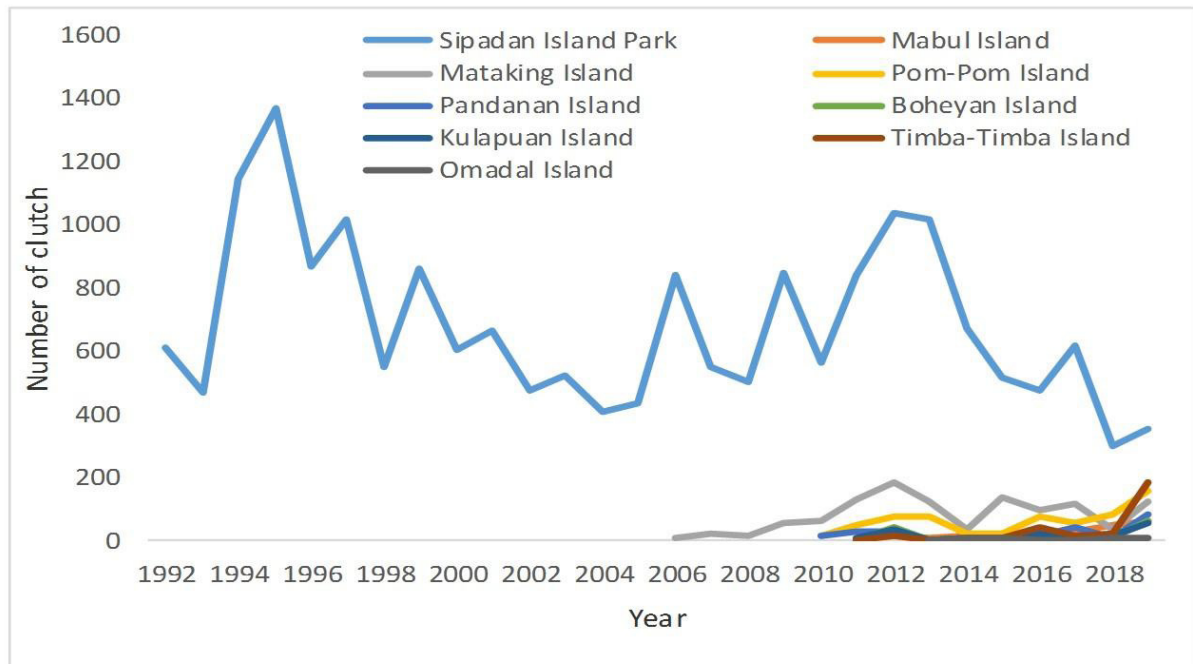


Figure 3: Green (above) and hawksbill (below) clutch abundance of nesting sites in the Celebes Sea.



### 1.3.2 Foraging grounds

While important foraging grounds of green and hawksbill turtles have already been identified (Jensen et al., 2016; Jolis, 2014; Joseph et al., 2014, 2016, 2017, 2021; Lim et al., 2020; Nishizawa et al., 2016, 2018, 2024; Palaniappan, 2017; Palaniappan & Hamid, 2017; Palaniappan et al., 2021), information on the abundance and trends in these areas are slowly being uncovered. Some foraging grounds are protected such as Tun Mustapha Park, Tiga Island Park, Tun Sakaran Marine Park and Sipadan Island Park, while the remaining areas are not protected. Figure 4 shows the distribution of marine turtle foraging grounds in Sabah.

# FORAGING GROUNDS OF MARINE TURTLE IN SABAH



Figure 4: Distribution of marine turtle foraging grounds in Sabah.

Recent work in Sipadan Island Park, Mabul and Mantanani islands indicate that the juvenile green and hawksbill turtles are most abundant (Tinsung et al., 2011; Palaniappan, 2017; Palaniappan & Hamid, 2017). Recent work on health of green and hawksbill turtles also revealed interspecific differences in blood values of turtles in the Celebes Sea (Syamsyahidah et al., 2025).

### 1.3.3 Movements

Compilation of metal tag recoveries shows that post-nesting turtles tagged in Sabah moved to other countries within the region (Veyra, 1994). This indicates that turtles are transboundary resources and require international collaboration and interventions. Nesting green turtles tagged in Turtle Islands Park and Sipadan Island Parks have been reported nesting, caught or stranded in the Philippines, Indonesia and Papua New Guinea (Veyra, 1994; Adnyana et al., 2008; Syed Kadir & Abe, 2009). Conversely, reports of nesting green turtles from the Philippines Turtle Islands were found nesting in Kukuban Island of Tun Mustapha Park, and Pom-Pom Island in the district of Semporna (Jolis, 2014; WWF-Malaysia, pers. comm.).

There are also records of other nesting movements of green turtles within Sandakan and Semporna districts, for example nesting green turtles in Turtle Islands Park found to be nesting in Libaran and Lankayan islands (Chung, pers. comm.; Yee, pers. comm.), as well as between Mataking Island and Pandanan Island (Jolis, 2014). Other records include nesting green turtles tagged in Turtle Islands Park were found in Semporna and Papar in 1995 and 2007 respectively (Syed Kadir & Abe 2009). In 2012, an adult nesting green turtle tagged in Sipadan Island Park was found in Mataking Island (Jolis, 2014). Nesting green turtles tagged in Turtle Islands Park and Turtle Islands Heritage Protected Area (TIHPA) were also found in the foraging grounds of Mabul Island (Palaniappan, pers. com.). These records suggest that the turtles were moving out from their nesting sites to search for food or were on their way migrating to their foraging grounds.

Published satellite tracking movements of post-nesting turtles reveals the same and complemented tag metal tag recoveries (Pilcher et al., 2019). Hawksbill turtles from Turtle Islands Park were found to move southward to Indonesia, and northward to Sandakan Bay and Bankawan Island, Kudat (Basintal, 2001), while green turtles were found to move to TMP and Semporna (Pilcher et al., 2019). Post-nesting movements of turtles from other parts of Malaysia and countries moving across the Sabah waters were also documented (Pilcher et al., 2019). Both west and east coasts of Sabah provide migration pathways for green turtles from Peninsular Malaysia (Liew et al., 1995a; Liew et al., 1995b; Luschi et al., 1996; Van De Merwe et al., 2009) Indonesia (Adnyana et al., 2008), Sarawak Turtle Islands Park (Liew et al., 2000), Thailand (Charuchinda et al., 2000), China (Cheng 2007) and Micronesia (Kolinski et al., 2014); for hawksbill turtles from Sarawak Turtle Islands Park (Pilcher et al., 2019), and for leatherback turtles from Indonesia (Benson et al., 2007).

## 1.4 Population genetics

Genetic studies have indicated that two green turtle nesting rookeries in Sabah are genetically distinct from other nesting rookeries, which means there are two green turtle breeding stocks in Sabah (Basintal, 2001; Dethmers et al., 2006; Syed Kadir & Abe, 2009; Jensen et al., 2016a; Nishizawa et al., 2018). These breeding stocks are the Turtle Islands Park and Sipadan Island Park. The Sabah Turtle Islands Park shares the same green turtle breeding stock with the Philippines Turtle Islands Park making it one of the largest green turtle nesting rookeries in Southeast Asia and further justifying the established of the Turtle Islands Heritage Protected Area (TIHPA). For hawksbill turtles, the hawksbill turtle nesting population in Turtle Islands Park is genetically distinct as well (Nishizawa et al., 2016).

Genetic studies showed that the green turtle rookeries of the Sarawak Turtle Islands Park (Nishizawa et al., 2024), the Turtle Islands Heritage Protected Area (TIHPA) and Peninsular Malaysia (Jensen et al., 2016b), and Micronesia (Nishizawa et al., 2018) contribute to foraging ground populations in Sabah (i.e. Tun Mustapha Park, Sipadan Island Park and Tun Sakaran Marine Park). In addition, the hawksbill turtle rookeries of the Sulu Sea, Philippines and Turtle Islands Park, Apo Reef Natural Park and Misamis Oriental also contribute to similar foraging ground populations (Nishizawa et al., 2016). Conversely, the Sulu Sea nesting populations are found to contribute to the foraging population in Brunei Bay, Sarawak (Joseph et al., 2016; 2023).

Studies on foraging grounds coupled with genetics revealed new insights on the population structure of turtles at foraging grounds. Joseph et al. (2016; 2023) suggested that there is an ontogenetic life stage shift of green turtle juveniles from developmental Mantanani and Layang-Layang foraging grounds could move to permanent Brunei Bay (Sarawak) foraging grounds. However, this result must be interpreted carefully as there are other foraging grounds that are yet to be identified in Sabah waters for example in northern Sabah and the Balabac Strait, which are hotspots for turtle poaching (Jensen et al., 2016; Joseph et al., 2019). A study on green turtle foraging population in Tun Mustapha Park found to have its natal origin to be from Turtle Islands Park and the Sarawak Turtle Islands Park (Nishizawa et al., 2024). Post-nesting green and hawksbill turtles from Turtle Islands Park are found to end at north of Sabah (Pilcher et al. 2019).

## 1.5 Importance

Marine turtles provide ecological, economic and cultural importance to Sabah.

Marine turtles maintain healthy marine habitats such as seagrass beds and coral reefs; provide key habitat for other marine life; help to balance marine food webs and facilitate nutrient cycling from water to land. Green turtles help to maintain seagrass beds. When they graze seagrasses, they increase the productivity and nutrient content of seagrass blades (Bjorndal 1980). Without constant grazing, seagrass beds become overgrown and obstruct currents, shade the bottom, begin to decompose and provide suitable habitat for the growth of slime moulds that are unsuitable for other marine life (Zieman et al., 1999). Seagrass beds are breeding and nursery grounds for juvenile-commercial fishes to grow, and these commercial fishes are a source of protein for community to consume. Unhealthy nursery grounds influence the growth of these fishes and subsequently the community's protein source.

Commercially important species (e.g. shrimp, lobster, and fish) thrive in healthier and productive seagrass beds and coral reefs, which are known to be important breeding and nursery areas for many species of fish and other marine life. Marine turtles maintain these areas thus contribute to better marine harvest, partly benefitting the fishery industry. All turtle species are also prey, providing food for other animals, both on shore and at sea. Reef fish, such as groupers and jacks, are common predators of both hatchlings and juvenile turtles (Gulko & Eckert 2004), and these fishes will eventually end up in commercial markets of the fishery industry. Unhealthy breeding and nursery grounds could impact the fishery industry.

The rich marine biodiversity of Sabah within the Coral Triangle makes marine life and recreation a top tourism attraction in Sabah. Turtles are one of the main attractions for tourism in Malaysia, repeatedly used in promoting Malaysia as a tourism destination and generating revenue for the country. In Sabah, the Ministry of Culture, Tourism and Environment (MTCE) views turtles as prominent species for promoting Sabah's marine ecosystem to tourists. Along with other key terrestrial species, turtles are considered one of Sabah's flagship species and heavily featured in promotional tourism videos and advertisements. The tourism industry continues to remain a key-income generating sector for the state. In 2016, the industry generated a revenue of RM7.25 billion in tourism receipts with 3.427 million tourist's arrival (The Star, 2017). The estimated total economic value of marine turtles in the Semporna Priority Conservation Area (PCA) in Sabah is USD 23 million per year, ranging from USD 21-25 million. The estimated non-consumptive value of marine turtles far exceeded the consumptive use value. Moreover, the protection of marine turtles could potentially generate 1146 tourism jobs, equivalent to USD 469,000 in employment income per year. The study highlighted that marine turtles have a positive economic impact on the tourism sector in Semporna (Teh et al., 2018). A reduced population of marine turtles could give a negative impact the state's tourism industry.

Furthermore, marine turtles have been showcased to give positive impacts to community through eco-tourism. A local community-based organisation namely the Kudat Turtle Conservation Society (KTCS) conducts turtle eco-tourism through hatchling release activities that generates additional income more than RM400 per nest to the community members (The Malaymail Online, 2016).

Culturally, marine turtles have existed as an integral part of Malaysia’s rich historical and cultural context and even recognised in this modern era. Positive values of turtles were documented in cultural stories such as ‘The Blind Women and the Turtle’ and ‘Why Turtles Live in the Sea’ (Borneo Literature Bureau; Sabah Folklore Online).

## 1.6 Major threats

Worldwide, marine turtles face numerous threats during all their life stages. Natural mortality (due to predation) is usually high during the first life stages, then drastically reduced once the turtle reaches maturity and a certain size. However, in recent years, human-induced threats have dramatically increased the mortality rates of marine turtles in all life stages. Threats impacting turtle populations in Sabah are unsustainable fishing practices; unregulated tourism practices; egg poaching and consumption; turtle poaching; improper conservation operations; impacts of climate change; unsustainable coastal development, and pollution and marine debris. Tables 2 and 3 explains the main threats identified, and the conservation challenges faced in Sabah in relation to marine turtles.

Table 2: Summary of major threats to marine turtles in Sabah.

THREATS	HUMAN ACTIVITIES CAUSING THREATS	IMPACT OF THREATS	DESCRIPTION
Unsustainable fishing practices	Gill nets, fish and shrimp trawls nets	Direct mortality as bycatch	Estimated annual catch of 4,490 turtles in Sabah (Pilcher et al., 2008). In TMP, estimated annual catch of 1,326.6 turtles by gill nets, fish trawl net and shrimp trawl (Beliku & Saleh, 2013).
	Blast and cyanide fishing	Predominantly habitat degradation; occasional documented direct mortality	1,195 blasts were recorded between June to September 2018 in Semporna through blasts detectors (WWF-Malaysia, unpublished data).  47 cases of blasts were heard in 2017 at TMP during a scientific expedition (WWF-Malaysia, unpublished data).

THREATS	HUMAN ACTIVITIES CAUSING THREATS	IMPACT OF THREATS	DESCRIPTION
Unregulated tourism practices	Boat movements and water-related activities	Direct mortality due to boat strike	<p>15 turtles were reported dead with distinct signs of boat strike between 2009 and 2018, but believed to be underreported (Sabah Wildlife Department, unpublished data). Boat strike is a threat to marine turtles in Mabul Island, where repeated injuries are recorded (Phu &amp; Palaniappan 2019).</p> <p>Threat is increasing due to expansion of the tourism and dive industry, and introduction of new water sports activities e.g. parasailing and jetskis.</p>
	Infrastructure and water-related activities	Habitat degradation due to man-made infrastructures, or water-related activities i.e. SCUBA, snorkelling, and boat anchor	<p>Construction of resorts and hotels at nesting sites or foraging grounds led to degradation of those habitats, subsequently led to unsuitable nesting conditions, or limited food availability. The sandy beaches of islands in Semporna are focus for tourism development.</p> <p>Excessive water-related activities such as large amount of divers or snorkelers, and dive anchors can stress or damage habitats.</p>
	Tourists	Direct stress due to direct interaction of tourists	Several cases of indiscriminate man-handling of turtles in Sabah in recent years.
Egg poaching	Demand for sale and consumption	Direct mortality	132 cases of seizures of eggs were recorded between 1999 and 2019 (WWF-Malaysia & Jabatan Hidupan Liar Sabah, 2018; Gomez and Krishnasamy 2019; WWF-Malaysia, unpublished data).

THREATS	HUMAN ACTIVITIES CAUSING THREATS	IMPACT OF THREATS	DESCRIPTION
			<p>Majority of seized eggs are sourced from the Philippines, but could be sourced locally too. Trading hotspot is Sandakan, with occasional reports in Kota Belud and Kota Kinabalu.</p> <p>Trading routes include Southern Philippines – Sabah; Sabah/ Indonesia/Philippine – Terengganu; and possibly Sabah – Brunei (WWF-Malaysia, 2009).</p>
Turtle poaching	Demand for sale and consumption	Direct mortality	<p>24 cases of seizures of whole parts or parts of turtles were recorded between 2004 and 2019. Turtles could be locally sourced and poaching hotspot is Semporna (WWF-Malaysia &amp; Jabatan Hidupan Liar Sabah, 2018; WWF-Malaysia, unpublished data).</p> <p>A consistent illegal trade route to mainland China from the Coral Triangle region of Southeast Asia (mainly the Philippines, Malaysia and Indonesia) (Lam et al., 2012), included turtle shell being harvested in Sabah (Gailard et al., 2020; Kirishnamoorthie et al., 2023; Joseph et al., 2014; Pertiwi et al., 2020)</p> <p>Turtle meat as exotic dishes for tourists (Gomez and Krishnasamy 2019).</p>

THREATS	HUMAN ACTIVITIES CAUSING THREATS	IMPACT OF THREATS	DESCRIPTION
Improper turtle conservation operations	Lack of guidelines adherence and lack of capacity	Indirect and direct mortality	Inconsistent and improper handling of egg relocation and incubation; female tagging or rehabilitation techniques could cause low hatch success of eggs, imbalanced natural sex-ratios of released hatchlings, biological data gaps, etc.
Impacts of climate change	All activities with high fossil fuels consumption that release greenhouse gasses to the atmosphere subsequently influenced the climate system	Indirect mortality, habitat degradation	<p>The changes may impact natural sex ratios of hatchlings, increase likelihood of disease outbreaks for turtles, and increase severe extreme weather events which then can lead to loss of nesting sites and foraging grounds.</p> <p>Gulisaan Island is facing continuous erosion possibly influenced by both human and natural factors (Saleh et al., 2013; Saleh, 2017; Chen et al., 2018).</p>
Unsustainable coastal development	Economic and human needs	Habitat degradation	<p>Construction of public recreational areas, industrial plants at nesting sites or foraging grounds led to degradation of those habitats subsequently provide unsuitable conditions for nesting attempts, or cause limited availability of food. Sedimentation also contributes to degradation of foraging grounds.</p> <p>Seaweed aquaculture farms are also found to be harvested at the same areas as turtle foraging grounds and can led to degradation of those habitats.</p>

THREATS	HUMAN ACTIVITIES CAUSING THREATS	IMPACT OF THREATS	DESCRIPTION
Pollution and marine debris	Tourism, ship activities, human wastage, usage of single- plastics	Direct mortality (including disease) and habitat degradation	<p>Oil, chemical and debris significantly contribute to the degradation of turtle populations and habitats. Non-biodegradable garbage thrown in the sea, particularly plastic could pose major mortality to turtles.</p> <p>Death of turtles could be seen due to ingestion of plastic led to “floater syndrome” seen on turtles rescued and rehabilitated in Sabah. Post-mortem revealed death due to intestinal tract damage or blockage with plastics. Presently, five cases reported with such syndrome (Sabah Wildlife Department, unpublished data).</p> <p>Recent study revealed presence of Fibropapilloma found in green turtles of Mabul Island. Causes of presence is unclear but could be related to pollution (Loganathan et al., 2021; Mashkour et al., 2020; Robben et al., 2023).</p>

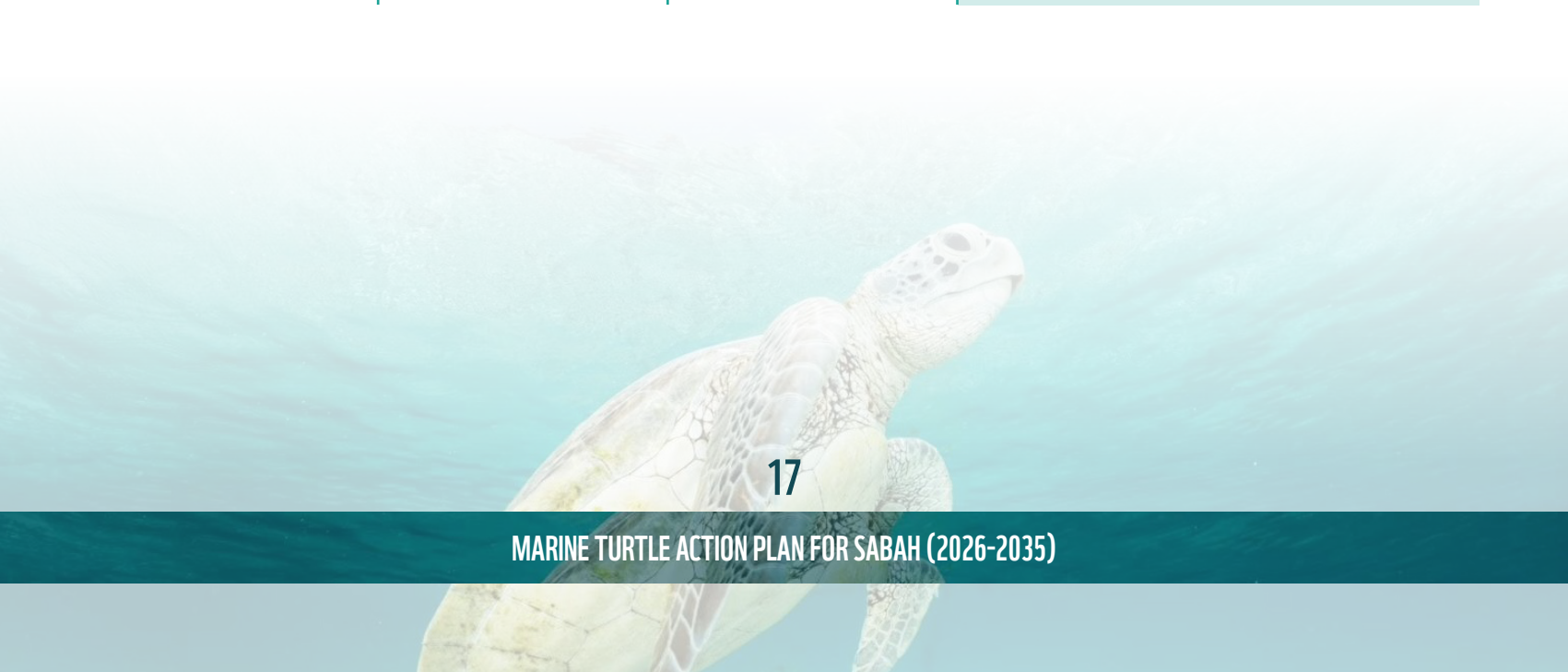


Table 3: Description of challenges to conservation of marine turtles in Sabah.

CHALLENGE	DESCRIPTION
Lack of understanding of biodiversity and ecosystem value	Lack of understanding on the important link and inter-dependence between socio-economic well-being and the health of marine ecosystems. There is growing evidences of marine ecosystems provides ecosystem services such as breeding and nursery grounds for fisheries, or coastal protection from extreme events which in turn benefits socio-economic well-being.
Lack of biological data sharing	There is a concern in Sabah on the improper usage of data. The inability to share data at regular intervals prevents informed and better understanding of the present status of turtles in the state.
Limited and fragmented protection	<p>Limited political support on marine turtle issues often lead to prioritisation of economic growth (such as tourism) over a long-term sustainable use and management of marine resources. Such prioritisation leads to continuous limited manpower and assets for wildlife management in Sabah.</p> <p>Fragmentation can be seen through the existing management and legislation of turtles in Malaysia that fall under the jurisdiction of the states i.e. legislation and management of marine turtles are different and varies according to states. Within Sabah level, there are two government bodies that oversee the management of turtles, which are the Sabah Parks (only for marine parks) and Sabah Wildlife Department. Marine turtles are fully protected species in Sabah. At the federal level, turtles are managed by the Department of Fisheries. However, not all species of turtles are protected in Peninsular Malaysia. In addition, this fragmentation also leads the disintegrate approach when comes to the interstate wildlife transit or crimes.</p> <p>There could be a lack of sustainable land use measures and policy that are needed to improve conditions for marine turtles.</p>
Lack of financial support	A lack of financial support backing conservation in Sabah limits the progress towards research and the conservation measures needed for marine turtles. This financial support is needed to support manpower and assets for wildlife management.
Low environmental awareness	Lack of awareness from decision-makers, tourists, consumers of marine products and maritime industries that directly or indirectly impacts the marine environment.



## 1.7 Management and conservation

Currently, all four species of marine turtles found in Sabah are listed in Appendix 1 of the global Convention of International Trade in Endangered Species of Wild Fauna and Flora, prohibiting all international commercial trade, as well as the global IUCN Red List of Threatened Species. While Malaysia does not have a species-specific conservation categorisation for marine turtles, the hawksbill is globally categorised as critically endangered, and if conservation efforts are not stepped up, the other species which are globally listed as least concern - green, or vulnerable – leatherback, and olive ridley, will follow suit.

In Sabah, two government bodies oversee the management of turtles, which are Sabah Parks and the Sabah Wildlife Department, while at the federal level, turtles are managed by the Department of Fisheries Malaysia. The jurisdiction of marine turtle management for the whole of Sabah falls under the Sabah Wildlife Department, through the Wildlife Conservation Enactment (WCE) 1997, while Sabah Parks oversees turtles and their associated habitats within the parks area through the Parks Enactment 1984. The green, hawksbill and olive Ridley turtles are currently totally protected under the Schedule 1, Section One of the WCE1997. Totally protected animals under Schedule 1 cannot be hunted. For those killing marine turtles illegally and found guilty of an offence under Section 25 WCE 1997, the penalty is a minimum fine of RM50,000 and maximum of RM250,000 plus imprisonment for no less than six months and up to five years.

At present, various activities and advocacy to manage marine turtles are being implemented at both state and on the ground levels. These activities range from legal protection of turtle habitats through establishments of marine parks or conservation areas; patrolling and monitoring on both sea and land (preventing turtle and egg poaching); development of guidelines; research, awareness, amongst others that are implemented by government agencies (i.e. Sabah Parks, Sabah Wildlife Department, Malaysian Maritime Enforcement Agencies, Marine Police, etc.), non-government organisations (i.e. WWF-Malaysia), private sectors (i.e. Reef Guardian, Scuba Junkie S.E.A.S, resort operators), research institutions (Universiti Malaysia Sabah, Marine research Foundation, etc.) and community-based organisations (*Persatuan Wanita Pulau Omadal*, *Persatuan Kekal Asli Tigabu*, *Kelab Belia Batu Sirih*, *Persatuan Pemuliharaan Penyu Kudat*, *Kelab Pencinta Alam Semporna*, etc.).

The management and conservation of marine turtles should be based on the existing legislative framework while contributes and provides synergy with existing conventions and plans either at national, regional or international levels. Table 4 shows the legislative framework for the protection of marine turtles in Sabah. Table 5 shows the international agreements relevant to marine turtles in which Malaysia is a party to, and Table 6 shows the state, national and international policies relevant to marine turtles.

Table 4: Summary of legislative framework for the protection of marine turtles in Sabah.

LAW	ACTION	COVERAGE
Wildlife Conservation Enactment 1997	Concerns regulating animals that should not be hunted, possession of protected animals and animal products and control of collection of animal products of species listed in Part 1 of Schedule 1. Green, Hawksbill and Olive Ridley are listed in Schedule 1 and are not allowed to be hunted or possessed. For those killing marine turtles illegally and found guilty of an offence under Section 25 WCE 1997, the penalty is a minimum fine of RM50,000 and maximum of RM250,000 plus imprisonment for no less than six months and up to five years.	This law operates at the state level.
Parks Enactment 1984	Concerns the prohibition of certain acts and offence. Marine turtles within a park or nature reserve are not allowed to be hunted, killed, injured, captured or disturb. All animal within park and nature reserve is protected. Sabah Park officer is also an authorised officer to enforce Wildlife Conservation Enactment 1997, therefore all animal listed in WCE 1997 is protected within park and nature reserve.	This law operates in the park and nature reserves of Sabah.
Environment Protection Enactment 2002	Concerns protection and management of the environment. An enactment related to the protection and management of the environment.	This law operates at the state level.
Ports and Harbours Enactment 2002	Concerns the speed and navigation of vessels. No vessel shall proceed at any speed contrary to speed restrictions imposed and navigated in a reckless or negligent manner.	This law operates at the state level.
Sabah Biodiversity Enactment 2000	Concerns access license to access biological resources in Sabah for research purposes.	This law operates at the state level.
Fisheries Act 1985	Concerns the protection of living aquatic resources in Malaysian fisheries waters. No person shall fish for, disturb, harass, catch or take any aquatic mammal or turtle which is found beyond the jurisdiction of any state of Malaysia.	This law operates at the federal level.



Table 5: Summary of international agreements relevant to marine turtles in which Malaysia is a party to.

TREATY	DESCRIPTION	
Marine Biodiversity	Convention on Biological Diversity (CBD)	The CBD’s objective is to develop national strategies for the conservation and sustainable use of biological diversity.
	Coral Triangle Initiative (CTI-CFF)	An initiative among six countries, including Malaysia, regarding the protection and management of coastal ecosystems and communities through seascape, ecosystem based fisheries management, climate change, marine protected areas and threatened and migratory species.
Endangered Species	Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES)	CITES aims to ensure that international trade in specimens of wild animals and plants does not threaten their survival.
	The Memorandum of Understanding on the Conservation and Management of Marine Turtles and their Habitats of the Indian Ocean and South-east Asia (IOSEA MoU)	This is an intergovernmental regional agreement under CMS that aims to protect, conserve, replenish and recover marine turtles and their habitats in the Indian Ocean and Southeast Asian region, working in partnership with other relevant actors and organisations.
	Turtle Islands Heritage Protected Area (TIHPA)	An agreement between Malaysia and the Philippines on the management of turtle’s islands.

Table 6: Summary of state, national and international policies relevant to marine turtles in Sabah.

LEVEL	POLICY	DESCRIPTION
State	Sabah Structure Plan 2033	Strives for long-term development in Sabah with strategic policies to determine the direction and pattern of the state’s physical development. This policy has been gazetted by the state assembly in 2016.
	Sabah State Policy on the Environment	As a guiding document in managing the State’s natural resources and environmental affairs.
	Sabah Biodiversity Strategy 2024-2034	The Strategy is a 10-year strategy that seeks to conserve Sabah’s biological diversity and to ensure that its components are utilised in a sustainable manner for the continued progress and socioeconomic development of the state.
	Sabah Shoreline Management Plan	The plan establishes a strategic framework for effective management of Sabah’s shorelines.
	Integrated Shoreline Management Plan	The plan is a guiding document to harmonise all the activities in the coastal area to support a broader set of management objectives for the coastal area.
	Sabah Island Management Plan	The plan provides the framework of strategies, regional priorities and tools to promote and guide the sustainable management of the islands.
	Sabah Parks Strategic Plan 2025	A plan that acts as a guiding document for Sabah Parks to achieve the vision of the agency.
	Tun Mustapha Park Integrated Management Plan 2017-2026	The plan is a guiding document for TMP management authorities to perform mandated functions in the park.

LEVEL	POLICY	DESCRIPTION
National	Thirteenth Malaysia Plan 2026-2030	This plan advances environmental sustainability by conserving biodiversity including endangered wildlife species, strengthening the protection and sustainable management of natural resources, and enhancing climate resilience.
	National Policy on Biological Diversity 2022-2030	The policy provides the direction and framework for Malaysia to conserve its biodiversity and use it sustainably in the face of the increasingly complex challenges.
	National Plan of Action for Conservation and Management of Sea Turtles	This plan lists priorities which comprise of comprehensive programs and actions for protecting, conserving and enhancing the population of marine turtles in Malaysia.
	National Policy on the Environment	The policy was established for continuous economic, social and cultural progress and enhancement of the quality of life of Malaysians through environmentally sound and sustainable development.
	National Ecotourism Plan 2016-2025	The plan serves as an instrument within the overall sustainable development of Malaysia and the economy, and as a tool for conservation of ecotourism sites in the country.
	National Policy on Climate Change	The policy serves as the framework to mobilise and guide government agencies, industry, community as well as other stakeholders and major groups in addressing the challenges of climate change in a concerted and holistic manner.
	CTI-CFF National Plan of Action 2.0 2025-2030	This plan aims to improve health of coastal and marine ecosystems and priority threatened species in Malaysia through effective management actions that supports the implementation of CTI-CFF Regional Plan of Action

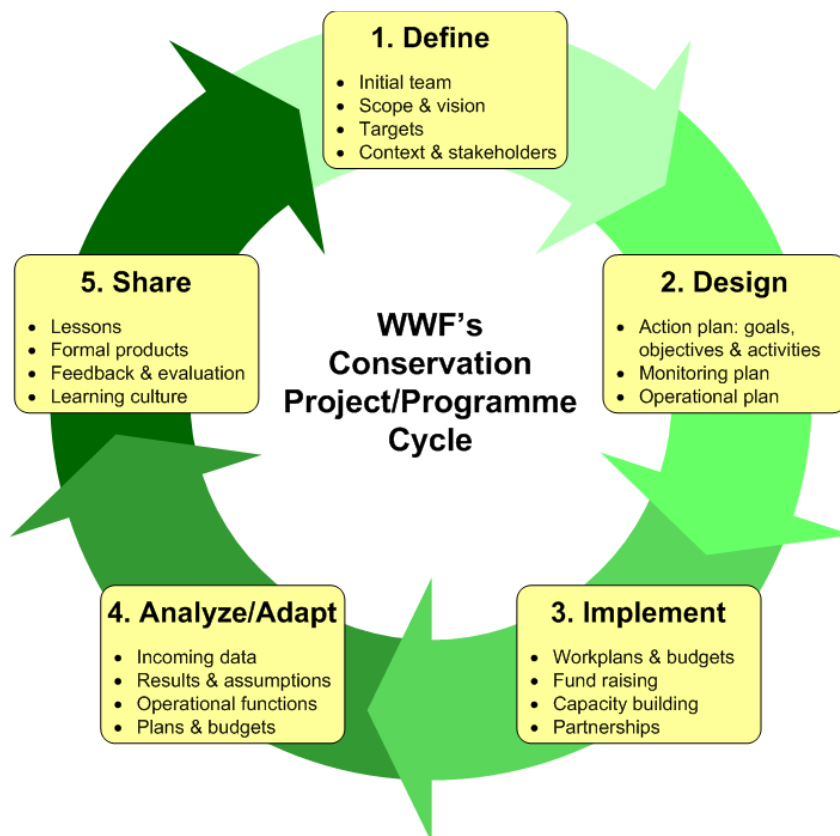
LEVEL	POLICY	DESCRIPTION
Regional	CTI-CFF Regional Plan of Action (RPOA) 2.0 2021-2030	This plan aims to improve health of coastal and marine ecosystems and priority threatened species in the Coral Triangle region through effective management actions.
	Single Species Action Plan for the Hawksbill Turtle in South-east Asia and the Western Pacific ocean Region (SSAP)	The SSAP provides a coordinated, regional framework to recover and safeguard hawksbill turtle populations across South-East Asia and the Western Pacific. It guides governments, NGOs, researchers, and communities to work together across borders
International	Kunming-Montreal Global Biodiversity Framework	Four long-term goals for 2050 and twenty-three action targets for 2030, the framework charts an ambitious pathway toward achieving the global vision of living in harmony with nature by 2050.
	Sustainable Development Goals 2016-2030	These are a global agenda, adopted by countries in 2015, with a vision of ending poverty, protecting the planet and ensuring that all people enjoy peace and prosperity.
	Integrated Coastal Zone Management	The plan is a resource management system following an integrative, holistic approach and an interactive planning process in addressing the complex management issues in coastal areas.
	United Nations Environment Programme	This programme of the United Nations coordinates the organisation's environmental activities and assists developing countries in implementing sound policies and practices.
	CITES Conf. 19.5. Conservation of and trade in marine turtles	CITES Conference of the Parties (CoP19) adopted Resolution Conf. 19.5 to strengthen global action on marine turtle conservation and to curb illegal trade in turtle products, eggs, and by-products.

## 2) FRAMEWORK

### 2.1 Purpose of plan

The Marine Turtle Action Plan (MTAP) of Sabah is a guiding comprehensive document for the Sabah Wildlife Department which has the mandate to protect and manage marine turtles in the State. It is acknowledged that responsibilities for the conservation actions outlined in the Plan may be shared among the relevant stakeholders. The MTAP sets the framework and operational mechanisms by which the Sabah Wildlife Department and relevant stakeholders can base their decisions and actions. The Plan also establishes the goals, strategies, objectives and activities for the next 10 years (2026-2035). This document was produced through a participatory process and an extensive consultation process at both state and districts level.

### 2.2 Planning process



The development of the MTAP was carried out by the Sabah Wildlife Department with technical support by WWF-Malaysia.

The starting point was the preparation of the analysis of the present state of marine turtles in Sabah, which includes the analysis of nesting and foraging abundance, distribution, legislation, policies, and existing conservation mechanisms based on existing data.

The vision of the MTAP, the most relevant threats, strategies, objectives and activities were identified through state- and district-level workshops. WWF-Malaysia as the technical facilitator, prepared the MTAP draft document taking account the results of analysis of the present state and outputs of the previous workshops. The draft was sent to technical experts and partners for

final comments. For consistency in planning, implementing and monitoring effective programmes, the development of the MTAP adopted the WWF Project and Programme Management Standards (PPMS) (Figure 5). The adoption of PPMS in developing MTAP also meets the needs of the stakeholders to have a clear, comprehensive and implementable plan.

The PPMS consists of a series of five steps, as follows:

1. Define who will be involved on the project team in the early stages, your projects geographic or thematic scope, your vision of what you hope to achieve, the context in which you intend to work including threats and opportunities, and who are the key stakeholders.
2. Design your action plan (including goals, objectives and activities), monitoring plan and operation plan.
3. Implement your workplans while ensuring sufficient funding, capacity and partners.
4. Analyse your data, results, assumptions and operation and financial performance then adapt your plans as necessary based on your findings.
5. Share lessons, formal communication products, feedback and evaluations, and a performance and learning culture with key external and internal audiences.

## 2.3 Vision

The desired ideal future for the marine turtles in Sabah is determined as follows:

**People of Sabah living in harmony with marine turtles**

## 2.4 Goals

To realise the vision, MTAP will strive to deliver two goals, namely:

1. **By 2035, nesting trend of marine turtles shows an increase or stabilising trend due to increased monitoring<sup>2</sup>, and**
2. **By 2035, critical turtle habitats are maintained or increasing<sup>3</sup>.**

To realise the vision, MTAP will strive to deliver two goals, namely: a To reflect the unique biology of marine turtles, a long-term 20-year goal is also developed, which is that by 2045, the nesting trends of marine turtles will show an increase or stabilising trend.



## 2.5 Guiding principles

To achieve the two goals, all decisions about the development and management of the MTAP are guided by the following guiding principles:

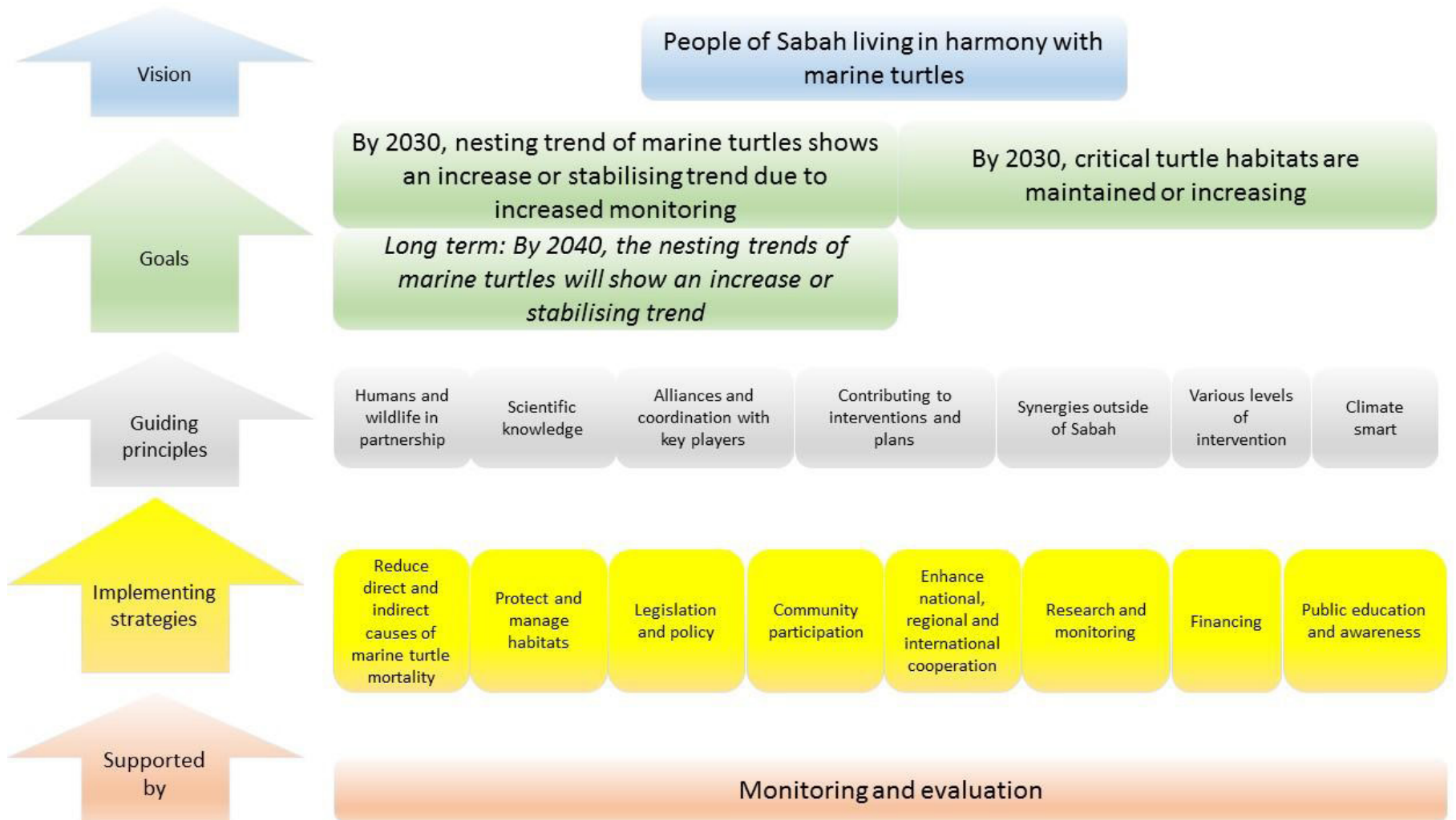
1. Outcomes of the MTAP takes into account the needs of humans and wildlife in partnership of shared benefits where threats are reduced and human well-being are maintained.
2. The MTAP will base its conservation actions on available scientific knowledge and the unique biological characteristics of marine turtles.
3. The MTAP acknowledges that the challenge of marine turtle conservation implies joint effort between all stakeholders, including governments, communities, non-governments, industries, other interest groups and key individuals. The MTAP foresees alliances and coordination with keys players in the conservation realm.
4. Contributing to various levels of conventions and plans (e.g. Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), the IOSEA MoU Conservation and Management Plan, the CTI-CFF Regional and National Plan of Action, the National Plan of Action for Conservation and Management of Sea Turtles, the Sabah Biodiversity Strategy 2024-2034).
5. Considering that marine turtles in Sabah travel to other regions (e.g. Indonesia, the Philippines, and Micronesia Federation, etc.), MTAP seeks synergies with marine turtle conservation opportunities and initiatives outside of Sabah.
6. The MTAP includes various levels of intervention through policy, research, education and awareness, and on-site actions.
7. Climate change has direct impacts on biodiversity and people, and the way that people adapt to the changing climate may put further pressure on the environment, including wildlife. Therefore, it is important that the MTAP is climate smart. Action Plan should identify and address climate and non-climate related threats and/or drivers together and consider the relationship between them.

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<sup>2</sup>The 2035 milestone goal is developed to reflect the increased monitoring efforts and nesting areas that are protected. In addition, a long term goal is set for 2045 because recruitment of turtles to nesting population can also be seen after a long period of time where hatchlings takes at least 20 years to mature and reproduce.

<sup>3</sup>The 'critical habitats' are identified turtle habitats that could be increased as compared to existing baseline gazettement of areas as marine parks or wildlife reserves (Strategy 2).

The following framework encapsulates the key components of MTAP and outlines the relationships between them (Figure 6).





### 3) STRATEGIES & ACTIVITIES

To achieve its vision and goals, the MTAP will focus on addressing the following eight strategies:

1. Reduce direct and indirect causes of marine turtle mortality;
2. Protect and manage habitats;
3. Legislation and policy;
4. Community participation;
5. Enhance national, regional and international cooperation;
6. Research and monitoring;
7. Financing, and
8. Public education and awareness.

The overall theory of change for the MTAP is shown in Figure 7. The activities that will be carried out to implement the strategies will achieve the various objectives and these will collectively produce the outcome of reduction in threats, which in turns improve the marine turtle nesting population and its associated habitats. Such improvement on the status of turtles and their habitats will contribute to the people of Sabah's well-being.

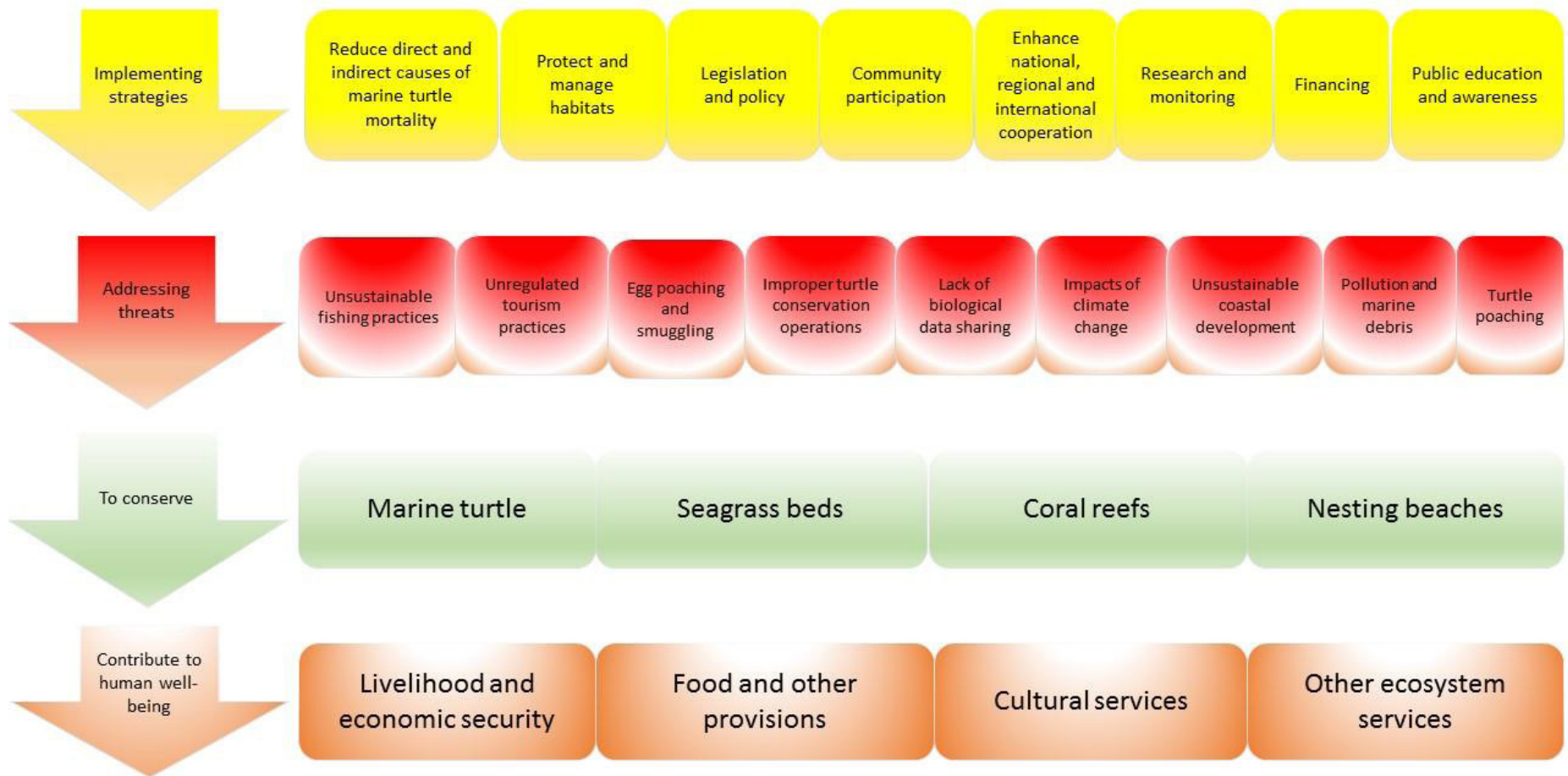


Figure 7: Theory of change of action plan



The objectives are as follow:

- a. By 2035, marine turtle mortalities due to direct and indirect causes shows a reducing trend;
- b. By 2035, critical turtle habitats are protected or effectively managed;
- c. By 2035, enforcement agencies capacity has increased by 10 times;
- d. By 2035, community-managed areas for marine turtle conservation has increased;
- e. By 2035, cooperation between stakeholders in national, regional or international levels has increased;
- f. By 2035, knowledge about the state of marine turtles in Sabah has improved;
- g. Financial budget for MTAP is allocated annually; and
- h. By 2035, education and awareness amongst public is raised.

Within each strategy, objective and activities have been defined, based on outputs from the stakeholders' workshops. These are presented in the following section and summarised in Table 7.

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<sup>4</sup> Does not include community-managed areas. This include marine protected areas, wildlife reserves and unprotected tourism areas.

Table 7: Strategies, objectives, outcomes and goals

STRATEGIES	OBJECTIVES	Threats / Issues addressed	Outcomes/Reduction in threats achieved	How it translates to achieving goals (reducing threats > improving status of target)	Goals and targets served
Reduce direct and indirect causes of marine turtle mortality	By 2035, marine turtle mortalities due to direct and indirect causes shows a reducing trend	<p>Direct causes: Unsustainable fishing practices, turtle poaching, egg poaching and consumption that impacts eggs and turtles</p> <p>Indirect causes: unregulated tourism practices, impacts of climate change, improper turtle operations by personnel with poor knowledge and skills</p>	Low mortality rates and number of animals injured through reduced threats by improvement of management, trainings and implementation of controlling and monitoring measures	Reduced mortalities will provide chances for hatchlings to be released to the sea and adult turtles to reproduce hence increase or maintain the populations	By 2035, nesting trend of marine turtles shows an increase or stabilising trend due to increased monitoring
Protect and manage habitats	By 2035, critical turtle habitats are protected or effectively managed	Unregulated tourism practises, unsustainable coastal development, pollution and marine debris, impacts of climate change that impacts the seagrass beds, coral reefs and sandy beaches	Pressures of unregulated tourism activities, unsustainable coastal development, pollution and impacts of climate change to the turtle habitats are reduced through protection or effectively managing the habitats	Protected or well-managed habitats for juvenile and adult turtles to forage and nests from human and non-human threats would enable more turtles to reproduce or forage for food safely	By 2035, critical turtle habitats are maintained or increasing
Legislation and policy	By 2035, enforcement agencies capacity has increased by 10 times	The lack of manpower in enforcement authorities in managing turtle poaching, egg poaching and consumption in Sabah	Turtle poaching, and egg poaching and smuggling in Sabah are reduced due to increase of manpower and resources of enforcement authorities. Sabah would also halt as a transit for egg trade to other states or countries	Reduced turtle poaching, and egg poaching and smuggling will allow adult turtles to be able to reproduce, and more eggs will be able to hatch and produce hatchlings to maintain population.	By 2035, nesting trend of marine turtles shows an increase or stabilising trend due to increased monitoring

STRATEGIES	OBJECTIVES	Threats / Issues addressed	Outcomes/Reduction in threats achieved	How it translates to achieving goals (reducing threats > improving status of target)	Goals and targets served
Community participation	By 2035, community-managed areas for marine turtle conservation has increased	Egg poaching and smuggling, turtle poaching, unsustainable coastal development that occurred surrounding the community areas which are also habitats for turtles. The lack of manpower in enforcement authorities in community areas.	Community efforts associated with turtle nesting (e.g. low-nesting) or foraging would be able to reduce pressures of egg poaching and smuggling, and turtle poaching at those areas	Protection of adult turtles and nests from poaching and smuggling will allow turtles to reproduce or hatchlings be able to produced	By 2035, nesting trend of marine turtles shows an increase or stabilising trend due to increased monitoring  By 2035, critical turtle habitats are maintained or increasing
Enhance national, regional and international cooperation	By 2035, cooperation between stakeholders in national, regional or international levels has increased	Pollution and marine debris, unsustainable coastal development that occurs at foraging areas beyond the state, and the limited cooperation between Sabah and the Philippines, Indonesia and China on turtle poaching, and egg poaching and smuggling. In addition, there are encroachment of foreign fishing vessels to Sabah waters	Turtle poaching and egg poaching and smuggling are reduced due to all strategic decisions made and implemented with active involvement of stakeholders at different levels	Protection of adult turtles and nests from poaching and smuggling, as well as habitat protection will allow turtles to reproduce or hatchlings be able to produced	By 2035, nesting trend of marine turtles shows an increase or stabilising trend due to increased monitoring
Research and monitoring	By 2035, knowledge about the state of marine turtles in Sabah has improved	The non-existent of a centralised database on turtle data and lack of research on certain parameters i.e. other identified nesting and foraging sites, and threats i.e. impacts of climate change,	New information on the status of turtles in Sabah in relation to egg poaching and smuggling, turtle poaching and impacts of climate change will guide relevant agencies to plan conservation effectively thus reducing impacts of those	Better understating will reduce turtles from pressures of poaching, smuggling and climate change will allow adult turtles to reproduce	By 2035, nesting trend of marine turtles shows an increase or stabilising trend due to increased monitoring

STRATEGIES	OBJECTIVES	Threats / Issues addressed	Outcomes/Reduction in threats achieved	How it translates to achieving goals (reducing threats > improving status of target)	Goals and targets served
		disease, improper turtle operations improper turtle operations by personnel with poor knowledge and skills	threats to turtles		
Financing	Financial budget for MTAP is allocated annually	The lack of funds to implement activities to reduce unsustainable fishing practices, unregulated tourism practices, egg poaching and smuggling, improper turtle conservation operations by personnel with poor knowledge and skills, lack of biological data sharing, impacts of climate change, unstainable coastal development and turtle poaching.	More funding available to fund for turtle related conservation activities will be able to fund key activities to reduce threats to the marine turtles	Through reduction of threats through implemented activities, turtles in the adult, egg and hatchling phases will be able to survive	By 2035, nesting trend of marine turtles shows an increase or stabilising trend due to increased monitoring  By 2035, critical turtle habitats are maintained or increasing
Public education and awareness	By 2035, education and awareness amongst public is raised.	The lack of awareness among public on the impacts of unsustainable fishing practices, unregulated tourism practices, egg poaching and smuggling, improper turtle conservation operations by personnel with poor knowledge and skills, impacts of climate change, unsustainable coastal development and turtle poaching.	General public and other relevant stakeholders are aware of marine turtles and the need for their conservation, thus which could influence their actions towards turtle conservation issues.	Through reduction of threats, turtles in the adult, egg and hatchling phases will be able to survive	By 2035, nesting trend of marine turtles shows an increase or stabilising trend due to increased monitoring  By 2035, critical turtle habitats are maintained or increasing

Table 8: The activities of Marine Turtle Action Plan for Sabah.

ACTIVITIES	PRIORITY	MAIN IMPLEMENTER	SUPPORTING IMPLEMENTER	START BY WHEN	ONE-OFF ESTIMATED COSTS (RM)
<b>Objective 1: By 2035, marine turtle mortalities due to direct and indirect causes shows a reducing trend</b>					
1. Manage impact of boat propellers to marine turtles through implementation of (i) determination of boat's speed limit for boats at identified turtle habitats, (ii) speed traps, and (iii) spotters on boats and awareness; and monitor implementation	H	SWD	JPDS MMEA Marine Police	Jan 2026	600,000
2. Implement the use of Turtle Excluded Devices (Distribute free TEDs) including distributing TED to trawler boat fishers in Sabah (i.e. Sandakan, Kudat and Tawau)	H	DOFS	MRF	Ongoing	Depending on the amount
3. Build capacity of trawler boat fishermen in using TED	H	MRF	DOFS	Ongoing	10,000
4. Phasing out trawler boats in Sabah	H	DOFS		2030	500,000
5. Continue to document marine turtle mortality from poaching, bycatch and boat propellers by (i) collecting mortality records annually, (ii) identify hotspots of mortality, and (iii) analyse to determine trends and suggest suitable	H	SWD	DOFS, Sabah Parks	2026-2035	500,000
6. Implement monitoring and analyse marine patrolling around nesting beaches	H	SWD, Sabah Parks	Resorts, hatchery managers	Ongoing	110,000
7. Implement monitoring and patrolling around foraging grounds to reduce turtle poaching	H	SWD, Sabah Parks	Resort, MMEA, Marine Police CBOs	Ongoing	200,000
8. Implement and continue collaborative enforcement patrols at both Sandakan town and seas to address egg selling	H	SWD	Sabah Parks, Marine Police, Royal Malaysian Customs, Immigration, MMEA	Ongoing	50,000
9. Use temperature probes to monitor temperatures in hatchery operations.	H	SWD, Sabah Parks	Hatchery managers	Dec 2030	100,000
10. Introduce circle hooks instead of J-hooks by (i) banning the import and manufacture of J-Hooks, and (ii) monitoring a grace period of 6-12 months	M	DOFS		2030	50,000

ACTIVITIES	PRIORITY	MAIN IMPLEMENTER	SUPPORTING IMPLEMENTER	START BY WHEN	ONE-OFF ESTIMATED COSTS (RM)
11. Procure, install and maintain critical equipment and technologies to implement enforcement efforts including those enforcements at airports and ports.	M	Royal Malaysian Customs Department	MAHB	Jan 2031	4,000,000
12. Expand turtle rehabilitation and hatcheries programme, if needed.	M	SWD	STGA	Ongoing	1,000,000
13. Develop a marine turtle conservation subject in courses for tour operators and guides as part of the terms for application or renewal of permits or licenses	M	SWD		Jan 2030	10,000
14. Develop and implement best practices of turtle eco-tourism	M	SWD	Resorts, tour operators	Jan 2030	10,000
15. Explore possibilities of introducing penalties for tour operators that harm the environment	L	EPD, DOE		2030	10,000
16. Implement ex-situ incubation for confiscated turtle eggs for reintroduction of turtles to other areas for example, Kuala Penyu	L	SWD		Ongoing	20,000
<b>SUBTOTAL</b>					<b>7,170,000</b>
<b>Objective 2: By 2035, critical turtle habitats are protected or effectively managed</b>					
1. Revise the existing Sabah Shoreline Management Plan and Integrated Shoreline Management Plan, and ensure that marine turtle habitats are effectively managed taking consideration from research results and impacts of climate change.	H	EPD, DID		Ongoing	3,000,000
2. Sabah Wildlife Department to be a permanent member in the Land Utilisation Committee for important district offices that are key districts for marine turtles such as Semporna, Kudat, Sandakan and Kuala Penyu.	H	Land and Survey Department		Dec 2026	5,000
3. Assess and identify environmentally sensitive areas (ESA) or high conservation value (HCV) areas for marine turtles and establish or improve their management plans for the identified ESA/HCV areas (this includes expansion of marine protected areas such as Taman Tun Sakaran Marine Park, Libaran and Mantanani islands as protected areas).	H	Sabah Parks, SWD	NGOs, TRPD	Dec 2035	900,000

ACTIVITIES	PRIORITY	MAIN IMPLEMENTER	SUPPORTING IMPLEMENTER	START BY WHEN	ONE-OFF ESTIMATED COSTS (RM)
4. Establish specific committees, such as Semporna Turtle Management Body, wildlife taskforce etc., to be strengthened and used as a platform for habitat Protection (this include consultation with stakeholders on the ground).	H	SWD		Ongoing	5,000
5. Patrol and monitoring blast fishing occurrences in addressing fish bombing in coral reefs	H	Sabah Parks, DOFS	Marine Police, MMEA	Ongoing	100,000
6. Implement beach restoration due to erosion, with study done on determining the suitable ways for restoration	H	DID, Universities		Ongoing	1,500,000
7. Usage of turtle-friendly lights in key turtle nesting beaches by replacing beach-facing lights and usage of suitable light colour	M	Resorts, tour operators		2030	50,000
8. Develop a state-wide policy to enhance waste management systems and infrastructure, supported by the phasing out of single-use plastics (including bags, straws, and similar disposable items), and informed by a comprehensive feasibility study	M	MLGH University		Jan 2026 - 2029	500,000
9. Implement best practices waste disposal programmes to reduce impact of debris at key turtle habitats, including annual beach or reef clean-ups programmes (i.e. International Coastal Clean-Up Day) at identified areas, such as islands.	M	DOE, NGOs	Resorts, community	Ongoing	600,000
10. Ensure IUCN Greenlist certification for MPAs in Sabah	M	Sabah Parks		Ongoing	100,000
11. Implement the use of artificial reefs to provide more habitats for turtles and prevent encroachment of trawlers	M	DOFS		Ongoing	100,000
12. Identify and assess areas of seaweed farming and turtle habitats to ensure foraging areas are not repurposed as seaweed farms	L	DOFS		Ongoing	50,000
13. Monitor and promote the protection of water quality from maritime pollution, including marine debris and petroleum industry derivatives and sewage	L	DOE		Jan 2030	500,000
14. Map migratory corridors linking Sabah's turtle nesting sites to regional foraging and breeding areas using satellite and flipper tagging data.	H	SWD, Sabah Parks	WWF	2028	100,000
<b>SUBTOTAL</b>					<b>7,510,000</b>

ACTIVITIES	PRIORITY	MAIN IMPLEMENTER	SUPPORTING IMPLEMENTER	START BY WHEN	ONE-OFF ESTIMATED COSTS (RM)
<b>Objective 3: By 2035, enforcement agencies capacity has increased by 10 times</b>					
1. Establish permanent office and personnel in key districts with significant turtle habitats and populations, such as Kudat and Semporna	H	SWD		2035	1,000,000
2. Prepare and submit a cabinet paper highlighting the economic benefits of turtle conservation to the state and highlighting the turtle as an important safety issue, to increase manpower for marine turtle enforcement in key districts of Sabah.	H	SWD		2026	None
3. Implement trainings and gazette more Honorary Wildlife Wardens and parks rangers in key districts of Sabah with significant turtle habitats.	H	SWD, Sabah Parks		Annually	50,000
4. Establish a wildlife intelligence unit in Sabah Wildlife Department	H	SWD		2026	100,000
5. Conduct series of capacity building and technical training courses for enforcement agencies and judges on investigation in relation to wildlife crimes.	H	SWD		Ongoing	60,000
6. Monitor cases of successful convictions	H	SWD		Ongoing	None
7. Establish an information Sharing Platform – within the relevant government agencies	M	SWD		2027	10,000
8. Implement and evaluate taskforces (i.e. State-level Wildlife Taskforce, Semporna Turtle Management Body, Tun Mustapha Park Collaborative Enforcement Committee).	L	SWD, Sabah Parks		Ongoing	4,000
9. Introduce and integrate genetic tools to support law enforcement investigations and strengthen prosecution of marine turtle trafficking cases	H	SWD	WWF	2028	100,000
<b>SUBTOTAL</b>					<b>424,000</b>

ACTIVITIES	PRIORITY	MAIN IMPLEMENTER	SUPPORTING IMPLEMENTER	START BY WHEN	ONE-OFF ESTIMATED COSTS (RM)
<b>Objective 4: By 2035, community-managed areas for marine turtle conservation has increased</b>					
1. Establish community-managed areas for marine turtles and establish their management plans for the identified areas together with assessing their plans	H	NGOs, SWD, SaBC	District office	Jan 2030	900,000
2. Identify sustainable financing opportunities, support and guidance for the implementation of the management plan, including tapping on relevant funding applications platforms such as SGP, SWOT.	H	NGOs		Ongoing	50,000
3. Implement a study to identify suitable alternative livelihoods (including income generating activities) that are not detrimental to marine turtles and their habitats, in consultation with local communities and other stakeholders such as eco-tourism providers (ensure equitable sharing of benefits with villagers).	H	Universities		Ongoing	100,000
4. Exchange, at regular intervals, efforts and successes of community-managed areas through suitable platforms (such as symposium, conference) or communication materials (such as annual reports, newsletters) between community groups, government organizations, non-government organizations and education institutions.	M	NGOs		Annually	100,000
5. Provide recognition and benefits to community members or individuals that have actively provide effort and assistance to enforcement agencies on marine turtle conservation	M	SWD		Annually	1,000,000
<b>SUBTOTAL</b>					<b>2,150,000</b>
<b>Objective 5: By 2035, cooperation between stakeholders in national, regional and international levels has increased</b>					
1. Explore the strength and opportunities of existing national, regional and international platforms suitable to address threats to marine turtles related to Sabah such as BIMP-EAGA, CTI-CFF, TIHPA	H	DOFS, Sabah Parks	SWD	Ongoing	5,000
2. Establish transboundary partnerships with other countries such as Brunei, China, Indonesia and the Philippines on poaching and egg trade issues	H	MTCE	SWD	2030	50,000
3. Establish a collaboration with Sarawak state and advocate for the protection of Brunei Bay as key foraging grounds for marine turtles from Sabah.	H	MTCE	SWD	2030	10,000

ACTIVITIES	PRIORITY	MAIN IMPLEMENTER	SUPPORTING IMPLEMENTER	START BY WHEN	ONE-OFF ESTIMATED COSTS (RM)
4. Information sharing engage regularly with the Southeast Asia Enforcement platform	H	SWD		Ongoing	10,000
5. Organise events between states or transboundary that encourage partnerships to address marine turtle threats	M	SWD	MTCE	2028	50,000
6. Advocate the importance of marine turtle conservation based on scientific evidence at national and regional platforms	M	SWD	MTCE	Ongoing	1,000
<b>SUBTOTAL</b>					<b>126,000</b>
<b>Objective 6: By 2035, knowledge about the state of marine turtles in Sabah has improved</b>					
1. Identify areas of critical habitat such as migratory corridors, nesting beaches, inter-nesting and foraging areas and subsequently incorporated in management plans.	H	University, NGOs		2030	500,000
2. Establish and maintain centralised database (nesting, stranding and other data) with terms and conditions of data sharing and usage of data are agreed upon by stakeholders	H	SWD		2030	200,000
3. Encourage innovation of data collection or environment monitoring such in turtle studies as Survey123 for ArcGIS, Photo-ID, etc that is accepted by local authorities (moving towards non-invasive methods)	H	SWD	Sabah Parks	2026-2035	100,000
4. Publish research in peer-reviewed journals that combines collaboration between universities and government agencies	H	Universities		Ongoing	3,000
5. Monitor implementation of standard operating procedures for marine turtles in Sabah with annual checks, and review of procedures every two years	H	SWD		2026-2035	50,000
6. Conduct capacity building for stakeholders involved in marine turtle management including hatcheries, patrols and tagging	H	SWD		2030	100,000
7. Encourage more studies on climate change impacts to the marine turtle populations and habitats specifically nesting and foraging grounds.	H	University, MRF		Ongoing	50,000

ACTIVITIES	PRIORITY	MAIN IMPLEMENTER	SUPPORTING IMPLEMENTER	START BY WHEN	ONE-OFF ESTIMATED COSTS (RM)
8. Conduct genetic studies at unsampled nesting rookeries such as in Tun Mustapha Park and Semporna islands, and integrate it into genetic databases.	M	University		2030	500,000
9. Conduct genetic studies at unsampled foraging grounds such as Tun Mustapha Park and Mabul Island	M	University		2030	500,000
10. Continue in-depth research on chelonid fibropapilloma-associated herpesvirus (CFPHV) and monitoring of marine turtles with occurrence of these diseases	M	University		2035	25,000
11. Forward confiscated marine turtles to researchers to be used to identify the origin of marine turtles poached from foraging grounds and reconstruction of marine turtles based on morphometric parameters to assist enforcement investigations.	L	SWD	University, Marine Police, MMEA, Malaysian Armed forces	Ongoing	50,000
12. Organise events at regular intervals to share scientific and technical information and expertise within the state and beyond, involving scientific institutions, non-governmental and international organisations.	L	NGOs		Every 3 years	300,000
13. Review the marine turtle conservation program in key nesting populations (i.e. Turtle Islands Park) for 5-10 years (including data from the Philippines Turtle Islands Park) through computer program in collaboration with researchers.	L	Sabah Parks		2030	50,000
<b>SUBTOTAL</b>					<b>1,928,000</b>
<b>Objective 7: Financial budget for MTAP is allocated annually</b>					
1. Develop a sustainable financing plan for marine turtle conservation in Sabah, listing out possible ways in financing activities in Sabah (from tourism, other platforms).	H	SWD	Sabah Parks, university	2030	50,000
2. Prepare and submit a cabinet paper highlighting the economic benefits of turtle conservation to the state and highlighting turtles as an important safety issue to obtain funding for priority activities of action plan	H	SWD		2026	None
3. Establish a Marine Turtle Trust Fund (Tabung Amanah Penyu) that acts as a source of funds to implement activities in Marine Turtle Action Plan for Sabah.	H	SWD		2026	None

ACTIVITIES	PRIORITY	MAIN IMPLEMENTER	SUPPORTING IMPLEMENTER	START BY WHEN	ONE-OFF ESTIMATED COSTS (RM)
4. Identify available funding sources at a number of levels, including government and intergovernmental i.e. SWOT, GEF, UNDP, IUCN, etc.	H	SWD	NGOs	Ongoing	None
5. Develop capacity at a various levels (ministry, government, and state-level) to prepare proposals which secure funding from government and inter-governmental programmes and non-government institutions.	H	NGOs		Ongoing	100,000
<b>SUBTOTAL</b>					<b>150,000</b>
<b>Objective 8: By 2035, awareness and education amongst public is raised.</b>					
1. Conduct awareness programmes or campaigns for target groups (e.g. teachers, schools, fishing communities). The programmes must focus on the plight of marine turtles and the urgent need to protect them and their habitats, and reduction of use of plastics	H	SWD	EPD, SEEN	Annually	500,000
2. Organise special events related to marine turtle conservation e.g. World Sea Turtle Day or similar events	H	SWD	NGOs, resorts	Annually	200,000
3. Raise awareness among tourism operators, and dive and tourist guides on marine turtle conservation and Do's and Don'ts.	H	SWD	STGA, MTCE	2027	20,000
4. Organise survey on level of awareness of public on marine turtles	H	SEEN		2026 and 2035	100,000
5. Raise awareness and promote marine turtle conservation to state representatives and non-conservation ministry as a priority among ministries, policy-makers, authority officers and prosecutors.	H	SWD		Annually	100,000
6. Develop in a creative manner education materials which demonstrate the ecological and economical value of marine turtles	M	SWD	EPD, SEEN	2030	50,000
7. Develop an appreciation programme for community members or tourist and dive guides who have contributed in marine turtle conservation	M	SWD		Annually	300,000
8. Develop a structured volunteer programme to assist monitoring work, data collection and research activities	L	SWD	NGOs	2027	20,000
<b>SUBTOTAL</b>					<b>1,290,000</b>



## 4) IMPLEMENTATION, MONITORING AND EVALUATION AND BUDGET

### 4.1 MTAP implementation

This is a 10-year action plan which will commence in 2026 and end by 2035. In order for this plan to achieve its ultimate objective of securing the future of the marine turtles in Sabah, all recommendations should be formulated by SWD and endorsed by the Sabah State Cabinet.

The monitoring of implementation of the MTAP remains the responsibility of SWD. However, implementation of action plan is under the responsibility of relevant stakeholders.

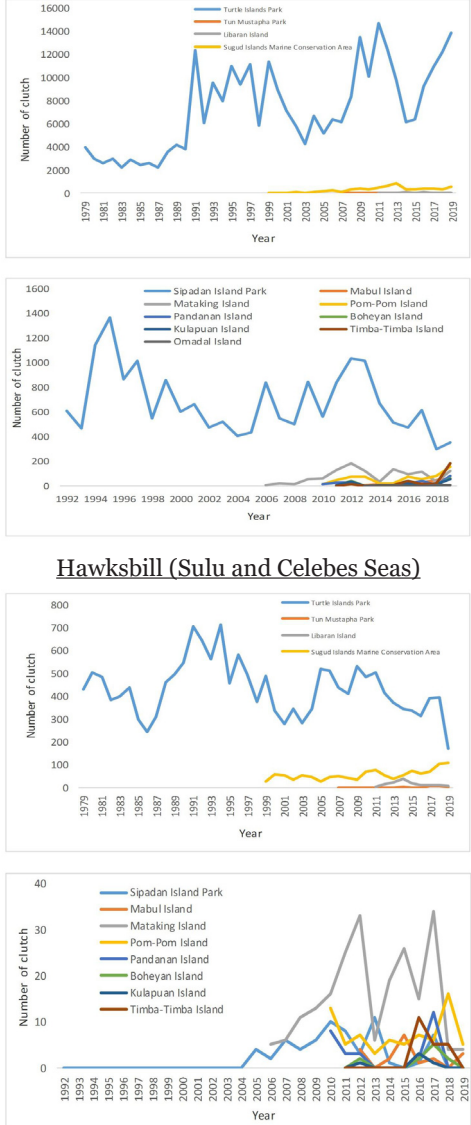
A Plan of Operation (PoA) for all suggested activities and its timeline is prepared to implement the MTAP. The PoA will also serve as a basis for monitoring the implementation of the activities. The PoA has been prepared and next step would be some of the baselines would need to be established.

It is proposed that a Species Action Plan Committee led by Ministry of Tourism, Culture and Environment is created, consisting of members from relevant NGOs, research institutions and government departments who will assess the implementation for each species action plan.

### 4.2 MTAP monitoring and evaluation

An overview and analysis of progress will be produced by SWD on a yearly basis and circulated to the relevant government departments and stakeholders. A mid-term review will be carried out at the end of 2030 (five years) by SWD, with the assistance of the main stakeholders. The plan will be fully reviewed and rewritten at the end of 2035 (10 years). SWD will be assisted by the Endangered Species Conservation Unit.

Table 9: Goals

ACTIVITIES	INDICATOR(S)	SOURCE OF DATA / METHOD	WHO	BASELINE	PLANNED INTERMEDIATE RESULT 2030
<p>1. By 2035, nesting trend of marine turtles shows an increase or stabilising trend due to increased monitoring</p> <p>Long-term: By 2045, the nesting trends of marine turtles in Sabah shows an increase or stabilising trend</p>	<p>Nesting trend or nest numbers</p>	<p>Report</p>	<p>SWD, Sabah Parks</p>	<p><b>Green (Sulu and Celebes Seas)</b></p>  <p><b>Hawksbill (Sulu and Celebes Seas)</b></p>	<p>Nesting trend of marine turtles shows an increase or stabilising</p>

ACTIVITIES	INDICATOR(S)	SOURCE OF DATA / METHOD	WHO	BASELINE	PLANNED INTERMEDIATE RESULT 2030
2. By 2035, critical turtle habitats are maintained or increasing	Hectares of seagrass beds	Report	Sabah Parks, NGOs	To be determined in 2026 based on existing latest baselines All marine parks	Seagrass beds are maintained or increasing
	Health status of seagrass beds				
	Hectares of coral reefs	Report	Reef Check Malaysia, Sabah Parks, NGOs,	2025 baseline All marine parks	Coral reefs are maintained or increasing
	Live coral cover of coral reefs				
	Hectares of sandy beaches	Report	SWD, Sabah Parks	To be determined in 2026 based on existing latest baselines Nesting beaches in marine parks	Sandy beaches are maintained or increasing

Table 10: Objectives

OBJECTIVES	INDICATOR(S)	SOURCE OF DATA / METHOD	WHO	BASELINE	PLANNED INTERMEDIATE RESULT 2030
1. By 2035, marine turtle mortalities due to direct and indirect causes shows a reducing trend	Marine turtle mortality trends in relation to abundance	Annual reports on mortality	SWD	To be determined in 2026 based on existing latest baselines	Decreased mortality rate and number of animals injured due to human activities is showing a reducing trend compared to baseline
2. By 2035, critical turtle habitats are protected or effectively managed	Number of identified habitats for marine turtles in Sabah with effective management plans in place	Reports to SWD and Sabah Parks	SWD, Sabah Parks	Pulau Tiga Park, Tun Mustapha Park, Turtle Islands Park, Tun Sakaran Marine Park, Sipadan Island Park  SIMCA	Management plans is in place at least one of the identified critical turtle habitats

OBJECTIVES	INDICATOR(S)	SOURCE OF DATA / METHOD	WHO	BASELINE	PLANNED INTERMEDIATE RESULT 2030
3. By 2035, enforcement agencies capacity increased by 10 times	Number of enforcement trainings conducted  Number of new enforcement and honorary wildlife wardens/rangers/staffs allocated  Number of successful convictions	Report and list of participants	SWD	To be determined in 2026 based on existing latest baselines	Enforcement agencies capacity increased by five times
4. By 2035, community-managed areas for marine turtle conservation has increased	Number of identified habitats for marine turtles managed by community with effective management plans in place	Report	SWD, Sabah Parks	Tun Mustapha Park, Omadal Island	Management plan is in place in at least one of the community-managed areas
5. By 2035, cooperation between stakeholders in national, regional and international levels has increased	Number of partnerships (MoU, MoA, etc.) established	MoU, MoA, etc.	SWD, Sabah Parks	TIHPA BIMP-EAGA CTI-CFF	At least one new partnership is established
6. By 2035, knowledge about the state of marine turtles in Sabah has improved	Number of published papers in peer-reviewed journals and technical reports produced	Peer-reviewed publications	University, and other research and academic institutions	+16 papers (2012-2025)	Status of critical turtle habitats and population size in Sabah mapped
7. Financial budget for MTAP is allocated annually	Number of activities stipulated in the action plan implemented  Number of funded and unfunded activities	Report	SWD	None	Marine Turtle Trust Fund established or sustainable funding mechanism plan for marine turtles in Sabah developed
8. By 2035, awareness and education amongst public is raised.	Number of awareness activities and campaigns conducted  Level of awareness through surveys	Report	EPD SWD	To be determined in 2026 based on existing latest baselines	World Sea Turtle Day event organised yearly for the past five years



### 4.3 MTAP budget

Objective 1: RM7,170,000

Objective 2: RM7,510,000

Objective 3: RM424,000

Objective 4: RM2,150,000

Objective 5: RM126,000

Objective 6: RM1,928,000

Objective 7: RM150,000

Objective 8: RM1,290,000

The breakdown of activities and associated costs for each objective are shown in Table 8.

# LIST OF ABBREVIATIONS

CBO	Community-based organisation
CITES	Convention on International Trade in Endangered Species of Wild Fauna and Flora
CTI-CFF	Coral Triangle Initiative on Coral Reefs, Fisheries and Food Security
CMS	Convention on the Conservation of Migratory Species of Wild Animals
DOE	Department of Environment
EPD	Environment Protection Department
et al.	And others
DOFS	Department of Fisheries Sabah
HWW	Honorary Wildlife Warden
IOSEA	Indian Ocean's South-East Asian
IUCN	International Union for Conservation of Nature
JPDS	Jabatan Pelabuhan dan Dermaga
KTCS	Kudat Turtle Conservation Society
MAHB	Malaysia Airports Holdings Berhad
MMEA	Malaysian Maritime Enforcement Agency
MPA	Marine Protected Area
MTAP	Marine turtle action plan
MTCE	Ministry of Tourism, Culture and Environment
MoU	Memorandum of Understanding
MRF	Marine Research Foundation
NGO	Non-government organisation
PoA	Plan of Operation
PCA	Priority Conservation Area
PPMS	Project and Programme Management Standards
RM	Ringgit Malaysia
RMU	Regional Management Unit
SEEN	Sabah Environmental Education Network
STGA	Sabah Tourism Guide Association
SWD	Sabah Wildlife Department
SCUBA	Self-contained underwater breathing apparatus
TIHPA	Turtle Islands Heritage Protected Area
TMP	Tun Mustapha Park
TRPD	Town and Regional Planning Department
USD	United States Dollar
WCE	Wildlife Conservation Enactment
WWF	World Wide Fund for Nature

# REFERENCES

- Adnyana, Windia, L. P. Soede, G. Gearheart, and M. Halim. 2008. Status of Green Turtle (*Chelonia Mydas*) Nesting and Foraging Populations of Berau, East Kalimantan, Indonesia, Including Results from Tagging and Telemetry. *Indian Ocean Turtle Newsletter* (7): 2–11. [http://www.seaturtle.org/iotn/pdfs/issue-7/iotn7\\_1.pdf](http://www.seaturtle.org/iotn/pdfs/issue-7/iotn7_1.pdf).
- Basintal, Paul. 2001. *The Status of Sea Turtle Populations in the State of Sabah, Malaysia. Technical Report for World Wild Fund for Nature Malaysia, Sulu Sulawesi Marine Ecoregion (SSME) Conservation Program (Project MYS 458/01)*. Kota Kinabalu.
- Beliku, J, and E Saleh. 2013. Threats of Fishing Gears on Turtles in Proposed Tun Mustapha Park, Kudat, Sabah. *Borneo Science* 33: 31–39. [http://www.seaturtle.org/PDF/BelikuJ\\_2013\\_B.pdf](http://www.seaturtle.org/PDF/BelikuJ_2013_B.pdf).
- Benson, Scott R. et al. 2007. Post-Nesting Migrations of Leatherback Turtles (*Dermochelys Coriacea*) from Jamursba-Medi, Bird's Head Peninsula, Indonesia. *Chelonian Conservation and Biology* 6(1): 150–54.
- Bjorndal, K. A. 1980. Nutrition and Grazing Behavior of the Green Turtle *Chelonia Mydas*. *Marine Biology* 56(2): 147–54.
- Borneo Literature Bureau. *Why Turtles Live in the Sea and Other Stories*. Sabah Museum.
- Charuchinda, Mickmin, Somchai Monanunsap, Sakamoto Wataru, and Arai Nobuaki. 2000. Migration Paths of Adult Female Green Turtles Detected by Satellite Telemetry. In *Proceedings of the First SEASTAR2000 Workshop (2000)*, 17–23.
- Chen, Nuo-Geng, Ejria Saleh, Tzuen Kiat Yap, and Irwan Isnain. 2018. Effect of Artificial Structures on Shoreline Profile of Selingan Island, Sandakan, Sabah, Malaysia. *Borneo Journal of Marine Science and Aquaculture* 2(December): 9–15.
- Cheng, I-Jiunn. 2007. Nesting Ecology and Postnesting Migration of Sea Turtles on Taipin Tao, Nansha Archipelago, South China Sea. *Chelonian Conservation and Biology* 6(2): 277–82.
- Dethmers, Kiki E.M. et al. 2006. The Genetic Structure of Australasian Green Turtles (*Chelonia Mydas*): Exploring the Geographical Scale of Genetic Exchange. *Molecular Ecology* 15(13): 3931–46.
- Gailard et al. 2020. Lost at sea: Determining geographic origins of illegally traded green sea turtles (*Chelonia mydas*) rescued on Hainan Island, China. *Wildlife Research* 48(1): 55-63.
- Gomez, Lalita, and Kanitha Krishnasamy. 2019. *A Rapid Assessment on the Trade in Marine Turtles in Indonesia, Malaysia and Viet Nam*.
- Gulko, David, and Karen Eckert. 2004. *Sea Turtles: An Ecological Guide*. Mutual Publishing.
- Jensen, Michael P. et al. 2016. Spatial and Temporal Genetic Variation among Size Classes of Green Turtles (*Chelonia Mydas*) Provides Information on Oceanic Dispersal and Population Dynamics. *Marine Ecology Progress Series* 543(January): 241–56.
- Jensen, Michael P., Nicolas Pilcher, and Nancy N. FitzSimmons. 2016. Genetic Markers Provide Insight on Origins of Immature Green Turtles *Chelonia Mydas* with Biased Sex Ratios at Foraging Grounds in Sabah, Malaysia. *Endangered Species Research* 31(1): 191–201.
- Jolis, Gavin. 2014. *An Update on the Marine Turtle Status in the Northeast Semporna Priority Conservation Area*.
- Jolis, G. Joseph, J., Nishizawa, H., Irwan, I. & Hussien, M. 2023. Marine turtle nesting and hatching in Tun Mustapha Park, Malaysia, revealed by community-based monitoring. *Herpetological Conservation and Biology*, 18(2): 275-289.

- Joseph, Juanita et al. 2016. Genetic Stock Compositions and Natal Origin of Green Turtle (*Chelonia Mydas*) Foraging at Brunei Bay. *Global Ecology and Conservation* 6: 16–24. <http://dx.doi.org/10.1016/j.gecco.2016.01.003>.
- . 2017. *Marine Turtle Landing, Hatching, And Predation In Turtle Islands Park (TIP), Sabah. Coastal And Marine Resources Management In The Coral Triangle-Southeast Asia (TA 7813-REG)*. <https://iwlearn.net/documents/25260>.
- . 2017. Utilization of Brunei Bay (Malaysia) as a Developmental and Foraging Habitat for Hawksbill Turtle (*Eretmochelys imbricata*). *Regional Studies in Marine Science* 16(October): 304–7. <http://dx.doi.org/10.1016/j.rsma.2017.09.012>.
- . 2019. Mass Sea Turtle Slaughter at Pulau Tiga, Malaysia: Genetic Studies Indicate Poaching Locations and Its Potential Effects. *Global Ecology and Conservation* 17: 1–8.
- . 2021. Chapter 7. Research and conservation of marine turtles at nesting and foraging grounds. In: Yoshida, T. & B.M. Manjaji-Matsumoto (Eds.). *The Marine ecosystems of Sabah*. Penerbit: Universiti Malaysia Sabah, Kota Kinabalu, Malaysia.
- . 2023. Health status and genetic compositions of green turtles (*Chelonia mydas*) foraging in Brunei Bay. *PLoS ONE* 18(11): e0293979.
- Joseph, Juanita, Yee Kuen Chong, P. Palaniappan, and Hock Chark Liew. 2014. Genetic Investigation of Green Turtles (*Chelonia Mydas*) Harvested from a Foraging Ground at Mantanani, Sabah, Malaysia. *Herpetological Conservation and Biology* 9(3): 516–23.
- Jumin, Rebecca, Sikula Magupin, et al. 2008a. *BIODIVERSITY CONSERVATION IN TUN MUSTAPHA PARK, KUDAT-BANGGI, SULU-SULAWESI MARINE ECOREGION: Recommended Inputs to the TMP Management Plan*. WWF-Malaysia.
- Jumin, Rebecca, Nattana Simon, et al. 2008b. *Habitats of and Threats on Sea Turtles in Kudat Priority Conservation Area - Results of Local Knowledge and Socio-Economic Surveys*. WWF-Malaysia.
- Kirishnamoorthie, J., Nishizawa, H., Alin, J., Hussien, M. & Joseph, J. 2023. Illegal tortoiseshell harvest of hawksbill turtles (*Eretmochelys imbricata*) in Southeast Asia: Evidence from Baturua Reef, Semporna, Sabah, Malaysia. *Journal of Sustainability Science and Management* 18(7): 54-67.
- Kobayashi, Donald R. et al. 2011. Loggerhead Turtle (*Caretta Caretta*) Movement off the Coast of Taiwan: Characterization of a Hotspot in the East China Sea and Investigation of Mesoscale Eddies. *ICES Journal of Marine Science* 68(4): 707–18.
- Kolinski, S P et al. 2014. Migrations and Conservation Implications of Post-Nesting Green Turtles from Gielop Island, Ulithi Atoll, Federated States of Micronesia. *Micronesica* 4: 1–9.
- Lam, Timothy, Xu Ling, Soyo Takahashi, and Elizabeth A Burgess. 2012. *Market Forces: An Examination of Marine Turtle Trade in China and Japan a Traffic East Asia Report*. Hong Kong. [http://www.trafficj.org/publication/12\\_Market\\_Forces\\_an\\_Examination\\_of\\_Marine\\_Turtle\\_Trade.pdf](http://www.trafficj.org/publication/12_Market_Forces_an_Examination_of_Marine_Turtle_Trade.pdf).
- Liew, H-C. C., E. H. Chan, F Papi, and P. Luschi. 1995. Long Distance Migration of Green Turtles from Redang Island, Malaysia: The Need for Regional Cooperation in Sea Turtle Conservation. In *Proceedings International Congress of Chelonian Conservation 6-10 July 1995*, 73–75.
- Liew, Hock-Chark, James; Bali, Eng-Heng; Chan, and Qswald Braken. 2000. Satellite Tracking of Green Turtles from the Sarawak Turtle Islands, Malaysia. *Marine Turtle Newsletter* (87): 20. <http://www.seaturtle.org/mtn/archives/mtn87/mtn87p20.shtml>.
- Liew, Hock Chark et al. 1995. Satellite Tracking Data on Malaysian Green Turtle Migration. *Rendiconti Fis Acc Lincei* 6: 239–46.
- Lim et al., 2020. Abundance, placement and sexual identity of the epizotic barnacle *Chelonibia testudinaria* relative to the size and species of host turtles in Mabul Island, Malaysia. *Journal of the Marine Biological Association of the United Kingdom* 100: 1299-1309.

- Loganathan, et al. 2021. First evidence of chelonid herpesvirus 5 (ChHV5) infection in green turtles (*Chelonia mydas*) from Sabah, Borneo. *Pathogens* 10, 1404.
- Luschi, P. et al. 1996. Long-Distance Migration and Homing after Displacement in the Green Turtle (*Chelonia mydas*): A Satellite Tracking Study. *Journal of Comparative Physiology A: Sensory, Neural, and Behavioral Physiology* 178: 447–52.
- Márquez, R.M. 1990. 11 Fao Species Catalogue *Sea Turtles of the World: An Annotated and Illustrated Catalogue of Sea Turtle Species Known to Date*.
- van De Merwe, Jason Paul, Kamarruddin Ibrahim, Shing Yip Lee, and Joan Margaret Whittier. 2009. Habitat Use by Green Turtles (*Chelonia mydas*) Nesting in Peninsular Malaysia: Local and Regional Conservation Implications. *Wildlife Research* 36: 637–45.
- Meylan, Anne. 1988. Spongivory in Hawksbill Turtles: A Diet of Glass. *Science* 239(4838): 393–95.
- Migliaccio et al. 2020. Nesting activity of *Chelonia mydas* and *Eretmochelys imbricata* at Pom-Pom Island, Sabah, Malaysia. *Marine Turtle Newsletter* 160, 8-13.
- Nishizawa, Hideaki et al. 2018. Comparison of the Rookery Connectivity and Migratory Connectivity: Insight into Movement and Colonization of the Green Turtle (*Chelonia mydas*) in Pacific–Southeast Asia. *Marine Biology* 165(4): 1–5. <https://doi.org/10.1007/s00227-018-3328-9>.
- Nishizawa, Hideaki, Juanita Joseph, and Yee Kuen Chong. 2016. Spatio-Temporal Patterns of Mitochondrial DNA Variation in Hawksbill Turtles (*Eretmochelys imbricata*) in Southeast Asia. *Journal of Experimental Marine Biology and Ecology* 474: 164–70.
- Nishizawa, Hideaki et al. 2024. Variations in body condition of green turtles (*Chelonia mydas*) in two nearby foraging grounds indicate their sensitivity to foraging habitats. *Aquatic Conserv: Mar Freshw Ecosyst*. 34:e4038. Online, Sabah Folklore. “Turtle Legends in Sabah.” [http://www.sabah.edu.my/itm07001/turtle\\_legend3.html](http://www.sabah.edu.my/itm07001/turtle_legend3.html).
- Palaniappan, P. 2001. *Distribution and Abundance of Sea Turtles in Sabah. Research Project 37/98*. Universiti Malaysia Sabah, Kota Kinabalu.
- . 2017. Morphometric Analysis of Resident Green Sea Turtles (*Chelonia mydas*) in Mabul Island, Sabah, Malaysia. *International Journal of Fisheries and Aquatic Studies* 5(6): 174–78.
- Palaniappan, Pushpa, and Haziq Harith Abd Hamid. 2017. Spatial Site Fidelity of Sea Turtles at a Foraging Ground in Mabul Island, Sabah. *International Journal of Fisheries and Aquatic Studies* 5(1): 140–44.
- Palaniappan et al. 2021. Demographic profile of the resident sea turtles in Mabul Island, Semporna. In: Yoshida, T. & B.M. Manjaji-Matsumoto (Eds.). *The Marine ecosystems of Sabah*. Penerbit: Universiti Malaysia Sabah, Kota Kinabalu, Malaysia.
- Pertiwi et al. 2020. Forensic genetic case study: Species identification and traceability of sea turtle caught in illegal trade in Bali, Indonesia. *Biodiversitas* 21(9): 4276-4283.
- Phu, Jun Lang, and Pushpa Palaniappan. 2019. Recaptured Wild Green Turtles (*Chelonia mydas*) with Newly Documented Boat Strike Injuries in Mabul Island, Sabah, Malaysia. *Chelonian Conservation and Biology* 18(2): 265.
- Pilcher, et al. 2008. *Rapid Bycatch Assessment - Malaysia*. Kota Kinabalu.
- Pilcher, N.J. et al. 2019. An Overview of Sea Turtle Tracking in Malaysia. *Indian Ocean Turtle Newsletter* (29): 1–17.
- Pilcher, N.J. 2025. *Chelonia mydas* (East Indian-West Pacific subpopulation). The IUCN Red List of Threatened Species.
- Pritchard, PCH. 1997. Evolution, Phylogeny, and Current Status. In: *The Biology of Marine Turtles*, Boca, Raton: CRC Press, 115–23.
- Robben et al. 2023. Increased prevalence and new evidence of multi-species chelonid herpesvirus 5 (ChHV5) infection in the sea turtles of Mabul Island, Borneo. *Animals* 13, 290.
- Saleh, Ejria et al. 2013. Changes in Small Islands of Tourist Destination Case Study: Turtle Islands Park, Sandakan, Sabah. *BIMP-EAGA Journal for Sustainable Tourism Development* 1(1): 21–33.

- Star, The. 2017. Sabah Posts Higher Tourism Receipts. 21 Feb 2017. : 2–7. <http://www.thestar.com.my/metro/community/2017/02/21/sabah-posts-higher-tourism-receipts/>.
- Syamsyidah, S., Mohd. Uzair, R., Kirishnamoorthie, J., Nishizawa, H., Hussien, M. & Joseph, J. 2025. Hematological and Blood Biochemical Variations, and their Correlation with Body Condition in Wild-Foraging Sea Turtles of the Celebes Sea. *Sains Malaysiana* 54(4): 959-974.
- Syed Kadir, Syed Abdullah, and Osamu Abe. 2009. SEAFDEC-MFRDMD *Report of the Third Regional Technical Consultation on Research for Stock Enhancement of Sea Turtles (Japanese Trust Fund IV Program)*.
- Teh, Louise S.L., Lydia C.L. Teh, and Gavin Jolis. 2018. An Economic Approach to Marine Megafauna Conservation in the Coral Triangle: Marine Turtles in Sabah, Malaysia. *Marine Policy* 89(July 2017): 1–10. <https://doi.org/10.1016/j.marpol.2017.12.004>.
- The Malaymail Online. 2016. “In Sabah’s North, Villagers Turn to Ecotourism (and Saving Turtles).” <http://www.themalaymailonline.com/malaysia/article/in-sabahs-north-villagers-turn-to-ecotourism-and-saving-turtles#sRPv58rvLyMw6rHb.99>.
- Veyra, Rhodora T D Ramirez De. 1994. Foreign Tag Recoveries from the Philippines. *Marine Turtle Newsletter* 64: 6–9.
- Wallace et al. 2023. Marine turtle regional management units 2.0: An updated framework for conservation and research of wide-ranging megafauna species. *Endangered Species Research* 52: 209-2023.
- WWF-Malaysia. 2009. Survey of Marine Turtle Egg Consumption and Trade in Malaysia. (March): 75.
- WWF-Malaysia, and Jabatan Hidupan Liar Sabah. 2018. *Perdagangan Telur Dan Pemburuan Penyu Di Sabah, Malaysia. Laporan Daripada WWF-Malaysia Dan Jabatan Hidupan Liar Sabah*. Kota Kinabalu.
- Zieman, Joseph C., James W. Fourqurean, and Thomas A. Frankovich. 1999. Seagrass Die-off in Florida Bay: Long-Term Trends in Abundance and Growth of Turtle Grass, *Thalassia Testudinum*. *Estuaries* 22(2 B): 460–70.

# NESTING DATA CITATIONS

## **TEMPURUNG**

Data source: Sabah Wildlife Department  
Year: 2018  
Species and counts: Hawksbill – 3 clutches

## **TURTLE ISLANDS PARK**

Data source: Sabah Parks  
Year: 2019  
Species and counts: Green - 13,886; hawksbill – 169; olive Ridley – 1 clutch

## **LIBARAN ISLAND**

Data source: Sabah Wildlife Department,  
Walai Penyu Libaran  
Year: 2019  
Species and counts: Green - 45; hawksbill – 5 clutches

## **LANKAYAN ISLAND**

Data source: Sabah Wildlife Department,  
Reef Guardian  
Year: 2019  
Species and counts: Green – 490; hawksbill  
– 92 clutches

## **BILLIEAN ISLAND**

Data source: Sabah Wildlife Department, Reef Guardian  
Year: 2019  
Species and counts: Green – 20; hawksbill – 8 clutches

## **TEGAIPIL ISLAND**

Data source: Sabah Wildlife Department,  
Reef Guardian  
Year: 2019  
Species and counts: Green – 68; hawksbill – 8 clutches

## **KUKUBAN ISLAND**

Data source: Sabah Wildlife Department,  
Persatuan Kekal Asli Tigabu  
Year: 2019  
Species and counts: Green – 4; hawksbill – 3;  
olive Ridley – 1 clutch

## **MANTABUAN ISLAND**

Data source: Sabah Wildlife Department,  
Persatuan Kekal Asli Tigabu  
Year: 2019  
Species and counts: Green – 2 clutches

## **TIBAKAN ISLAND**

Data source: Sabah Wildlife Department,  
Persatuan Kekal Asli Tigabu  
Year: 2019  
Species and counts: Green – 2 clutches

## **TIGABU ISLAND**

Data source: Sabah Wildlife Department,  
Persatuan Kekal Asli Tigabu  
Year: 2019  
Species and counts: Green – 1 clutch

## **MALAWALI ISLAND**

Data source: Sabah Wildlife Department,  
Kudat Turtle Conservation Society  
Year: 2017  
Species and counts: Green – 1 clutch

## **KALAMPUNIAN ISLAND**

Data source: Sabah Wildlife Department,  
Kudat Turtle Conservation Society  
Year: 2018  
Species and counts: Hawksbill – 1 clutch

## **KOK SIMPUL**

Data source: Sabah Wildlife Department,  
Kelab Belia Batu Sireh Balambangan  
Year: 2019  
Species and counts: Green – 1 clutch

## **KUKUS**

Data source: Sabah Wildlife Department,  
Kelab Belia Batu Sireh Balambangan  
Year: 2019  
Species and counts: Green – 1 clutch

## **KALUTAN ISLAND**

Data source: Sabah Wildlife Department,  
Kelab Belia Batu Sireh Balambangan  
Year: 2019  
Species and counts: Green – 1 clutch

## **TIGA ISLAND**

Data source: Sabah Wildlife Department,  
Kudat Turtle Conservation Society  
Year: 2019  
Species and counts: Green – 1 clutch

**BAVANG JAMAL**

Data source: Sabah Wildlife Department,  
Kudat Turtle Conservation Society

Year: 2019

Species and counts: Hawksbill – 1 clutch

**SIMPANG MENGAYAU**

Data source: Sabah Wildlife Department,  
Kudat Turtle Conservation Society

Year: 2019

Species and counts: Hawksbill – 1 clutch

**BERUNGUS**

Data source: Sabah Wildlife Department,  
WWF-Malaysia

Year: 2019

Species and counts: Green – 1 clutch

**MABUL ISLAND**

Data source: Sabah Wildlife Department,  
Scuba Junkie S.E.A.S.

Year: 2019

Species and counts: Green – 59; Hawksbill – 3 clutches

**MATAKING ISLAND**

Data source: Sabah Wildlife Department,  
The Reef Dive Resort

Year: 2019

Species and counts: Green – 117; Hawksbill – 4 clutches

**POM-POM ISLAND**

Data source: Sabah Wildlife Department,  
Pom-Pom Island Resort, Tropical Research and  
Awareness Centre, Mussah Poteh Resort

Year: 2019

Species and counts: Green – 151; Hawksbill – 5 clutches

**PANDANAN ISLAND**

Data source: Sabah Wildlife Department,  
WWF-Malaysia

Year: 2019

Species and counts: Green – 83 clutches

**BOHEYAN ISLAND**

Data source: Sabah Wildlife Department,  
WWF-Malaysia

Year: 2019

Species and counts: Green – 60 clutches

**KULAPUAN ISLAND**

Data source: Sabah Wildlife Department,  
WWF-Malaysia

Year: 2019

Species and counts: Green – 50 clutches

**TIMBA-TIMBA ISLAND**

Data source: Sabah Wildlife Department,  
Sipadan-Kapalai Dive Resort

Year: 2019

Species and counts: Green – 180 clutches

**OMADAL ISLAND**

Data source: Sabah Wildlife Department,  
Omadal Island Women Association

Year: 2019

Species and counts: Green – 4 clutches

**SIPADAN ISLAND PARK**

Data source: Sabah Parks

Year: 2019

Species and counts: Green – 349 clutches

**MANTANANI BESAR ISLAND**

Data source: Sabah Wildlife Department

Year: 2019

Species and counts: Green – 1 clutch

# WORKSHOP PARTICIPANTS

## Kota Kinabalu (Planning Workshops 1-3)

NO.	NAME	MINISTRY/DEPARTMENT/AGENCY
1.	Monica Gualin	Kementerian Pelancongan, Kebudayaan dan Alam Sekitar
2.	Mary Malangking	Kementerian Pelancongan, Kebudayaan dan Alam Sekitar
3.	Chelsea Daphne Charles	Kementerian Pelancongan, Kebudayaan dan Alam Sekitar
4.	Lawrence Kissol	Jabatan Perikanan Sabah
5.	Yong Kim Ming @ Henry	Jabatan Tanah dan Ukur Sabah
6.	Irwan Isnain	Taman-Taman Sabah
7.	Jumrafiah Abd. Shukur	Jabatan Hidupan Liar Sabah
8.	Hussien bin Muin	Jabatan Hidupan Liar Sabah
9.	Aznandy Md. Yakub	Jabatan Hidupan Liar Sabah
10.	Natalia Nadia Yahya	Jabatan Hidupan Liar Sabah
11.	Sailun bin Aris	Jabatan Hidupan Liar Sabah
12.	Zulkurnain Hashim	Jabatan Hidupan Liar Sabah
13.	Mohd. Soffian Abu Bakar	Jabatan Hidupan Liar Sabah
14.	Abd. Rahimin bin Ag Yahya	Jabatan Hidupan Liar Sabah
15.	Roland O. Niun	Jabatan Hidupan Liar Sabah
16.	Prof. Madya Dr. Juanita Joseph	Universiti Malaysia Sabah
17.	Roland Agansai	Persatuan Pemuliharaan Penyu Kudat (KTCS)
18.	Sofia Johari	Persatuan Pemuliharaan Penyu Kudat (KTCS)
19.	Eva Vivian Justine	Persatuan Pemuliharaan Penyu Kudat (KTCS)
20.	Roziyah binti Jalalid	Persatuan Wanita Pulau Omadal (WAPO)
21.	Sitti Rasah Hj Abdul	Persatuan Wanita Pulau Omadal (WAPO)
22.	Achier Chung	Reef Guardian Sdn Bhd
23.	Davies Austin Spiji	Reef Guardian Sdn Bhd
24.	Gavin Jolis	WWF-Malaysia
25.	Lavernita Pedro Bingku	WWF-Malaysia
26.	Choo Poh Leem	WWF-Malaysia
27.	Aarston Friend Dickson	WWF-Malaysia
28.	Joannie Jomitol	WWF-Malaysia
29.	Mohammad Asri Barail	WWF-Malaysia
30.	Prescilla Jane Peter	WWF-Malaysia
31.	Sheelasheena Damian	WWF-Malaysia
32.	Monique Sumampouw	WWF-Malaysia
33.	Susan Pudin	Jabatan Perlindungan Alam Sekitar Sabah
34.	Juitah binti Laipat	Jabatan Pelabuhan dan Dermaga Sabah
35.	Stephanie Kam Pui Kuan	Sabah Tourist Guides Association
36.	Betty Gaisong	WWF-Malaysia
37.	Ernest Jinaut	Jabatan Perikanan Sabah

# WORKSHOP PARTICIPANTS

## Tun Mustapha Park

NO.	NAME	MINISTRY/DEPARTMENT/AGENCY
1.	Intan Baijana Sapazi	Banggi Coral Conservation Society
2.	Juliana Digan	Banggi Coral Conservation Society
3.	Rosland	Kelab Belia Batu Sirih
4.	Razas bin Akbaru	Kelab Belia Batu Sirih
5.	Sofia Johari	Persatuan Pemuliharaan Penyu Kudat (KTCS)
6.	Rudy Agansai	Persatuan Pemuliharaan Penyu Kudat (KTCS)
7.	Saini Sangkiu	Persatuan Pemuliharaan Penyu Kudat (KTCS)
8.	Roland Agansai	Persatuan Pemuliharaan Penyu Kudat (KTCS)
9.	Eddy Oyoi	Persatuan Pemuliharaan Penyu Kudat (KTCS)
10.	Eva Justine	Persatuan Pemuliharaan Penyu Kudat (KTCS)
11.	Absan Saman	Persatuan Kekal Asli Tigabu
12.	Azrin Temhal	Persatuan Kekal Asli Tigabu
13.	Junaidi Awang bing Awang Bulat	Tajau Laut Guesthouse
14.	Ivan Tan	Blue Fin Surf and Dive
15.	Asmarina binti Usman	North Borneo Biostation Resort
16.	Diana Drisno	9 Huts on a Hill
17.	Tommy	Tommy's Place
18.	Jane	Tommy's Place
19.	Shahrizal Nizam bin Sahidal	Lembaga Kemajuan Ikan Malaysia Pejabat Kudat
20.	Josue Sammy	Agensi Penguatkuasaan Maritim Malaysia
21.	Insp Sujanto bin Sudarjo	BN16 Pasukan Gerakan Am Kudat
22.	Donald bin Ansaimoa	Pasukan Polis Marin Kudat
23.	Mohd. Zulhilmy Zakaria	Pejabat Daerah Kudat
24.	Jahari Hj. Saon	Pejabat Daerah Kecil Banggi
25.	Datu Afnan	Taman-Taman Sabah
26.	Roland Niun	WWF-Malaysia
27.	Gavin Jolis	WWF-Malaysia
28.	Sarmalin Sakirun	WWF-Malaysia
29.	Zaharen Awang	WWF-Malaysia
30.	Prescilla Jane Peter	WWF-Malaysia
31.	Lavernita Bingku	WWF-Malaysia
32.	Mohd. Asri Barail	WWF-Malaysia
33.	Mohd. Zulfikar Jaffar	WWF-Malaysia
34.	Gajar Ahmad	WWF-Malaysia
35.	Mohd. Omar Barail	WWF-Malaysia

# WORKSHOP PARTICIPANTS

## Semporna

NO.	NAME	MINISTRY/DEPARTMENT/AGENCY
1.	Sailun Hj Aris	Jabatan Hidupan Liar Sabah
2.	Zulkifli	Jabatan Hidupan Liar Sabah
3.	Zulkurnain bin Hashim	Jabatan Hidupan Liar Sabah
4.	Prescilla Jane Peter	WWF-Malaysia
5.	Gavin Jolis	WWF-Malaysia
6.	Aarston Friend Dickson	WWF-Malaysia
7.	Herminatalia Tabar	WWF-Malaysia
8.	Choo Poh Leem	WWF-Malaysia
9.	Nurulisma Mansula	Persatuan Wanita Pulau Omdal (WAPO)
10.	Sitti Rasah Abdul	Persatuan Wanita Pulau Omdal (WAPO)
11.	Jeethvendra	TRACC
12.	Kit	TRACC
13.	Yusuf Tangallah	Kulapuan Island Resort
14.	Askalani Ketin	Kulapuan Island Resort
15.	Oriana Miguaccio	Pom-Pom Island Resort
16.	Ismail bin Majid	Pulau Sipadan Resort Sdn. Bhd.
17.	Mohd. Khairuddin Riman	SJ SEAS
18.	David McCann	SJ SEAS
19.	Hamsani Insunan	Kapalai Island Resort
20.	Subuh Yunus	Borneo Divers and Sea Sports (Sabah) Sdn Bhd
21.	Rosland Maizim	Borneo Divers and Sea Sports (Sabah) Sdn Bhd
22.	Mark Michael	Sipadan Dive Centre
23.	Tan Chee Han	Mussah Poteh Resort
24.	Aaron Roa	Mataking The Reef Dive Resort
25.	Hafizul Hafiz bin Ladja Hassan	Pejabat Daerah Semporna
26.	Iskandar Mahadi	Pejabat Daerah Semporna
27.	Sj Ujam Sinjan	Ibu Pejabat Polis Daerah Semporna
28.	Up. Nuizi	Ibu Pejabat Polis Daerah Semporna
29.	Mejar Ariff	Angkatan Tentera
30.	Jasper Joel Veeter	Jabatan Pelabuhan dan Dermaga Pejabat Semporna
31.	Mohd. Farhan Ijaisian	Eastern Sabah Security Command

# WORKSHOP PARTICIPANTS

## Sandakan

NO.	NAME	MINISTRY/DEPARTMENT/AGENCY
1.	Gavin Jolis	WWF-Malaysia
2.	Prescilla Jane Peter	WWF-Malaysia
3.	Abd. Nasir Salahuddin	Taman-Taman Sabah
4.	Lt. (M) Rohayu Osman	Agensi Penguatkuasaan Maritim Malaysia
5.	Azizi bin Mohammad	Eastern Sabah Security Command
6.	Primus Lukas	Pejabat Perikanan Daerah Sandakan
7.	Hussien Muin	Jabatan Hidupan Liar Sabah
8.	Aznandy Md. Yakub	Jabatan Hidupan Liar Sabah
9.	Zulkiffle Mohd. Salleh	Jabatan Kastam Diraja Malaysia Sandakan
10.	Jamizan Ompios	Jabatan Kastam Diraja Malaysia Sandakan
11.	Cornelius Kee Seong	Jabatan Tanah dan Ukur Pejabat Ukur Daerah Sandakan
12.	Leony Sikim	Reef Guardian Sdn. Bhd.
13.	Alexander Yee	Friends of Sea Turtles Education and Research
14.	Fatihmah Johari	Crystal Quest Sdn. Bhd.





Figure 2: Participants of the planning workshop 1 in Kota Kinabalu.



Figure 9: Participants of the planning workshop 2 in Kota Kinabalu.



Figure 10: Participants of planning workshop 3 in Kota Kinabalu.



Figure 11: Participants of consultation workshop with Tun Mustapha Park stakeholders.



Figure 12: Participants of consultation workshop with Semporna district stakeholders.



Figure 13: Participants of consultation workshop with Sandakan district stakeholders.

