



Scaling Up Nesting Monitoring for Enhanced Conservation Efforts of Painted and River Terrapins in Terengganu, Malaysia

Final Project Report 2024-2025



Acknowledgement

WWF-Malaysia would like to express its sincere appreciation to the **Mohamed bin Zayed Species Conservation Fund** for its generous financial support, which made the implementation of this terrapin conservation project possible. The support provided was instrumental in sustaining critical nest monitoring, hatchery operations, awareness activities, and community engagement efforts throughout the project period.

We would also like to acknowledge the invaluable support and cooperation of relevant government agencies, including the **Department of Wildlife and National Parks (PERHILITAN)**, **Department of Fisheries Malaysia (DOF)**, and **local district authorities**, whose guidance, permissions, and coordination contributed significantly to the successful implementation of project activities. Appreciation is also extended to the **Royal Malaysia Police (PDRM)** for receiving project notifications and providing support related to safety and precautionary measures during field operations.

Our sincere thanks go to the local communities, beach tenderers, and hatchery workers for their collaboration and commitment to protecting terrapin nests and supporting conservation activities on the ground. We are also grateful to our partner non-governmental organisations, universities, volunteers, and students whose technical expertise, participation, and enthusiasm strengthened project delivery and outreach efforts.

Finally, WWF-Malaysia extends its gratitude to the project team and supporting staff whose dedication and perseverance ensured the effective implementation of this project despite operational challenges.

Front page photo:

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A female painted terrapin returns to the beach after nesting.

Executive Summary

WWF-Malaysia's terrapin conservation project in Terengganu focused on nest protection, egg incubation, community engagement, and awareness-raising to support the long-term conservation for two critically endangered species: the river terrapin in Setiu and painted terrapin in Kerteh. The project strengthened on-the-ground conservation efforts by safeguarding nests, improving hatchery management, and engaging local communities to reduce key threats such as egg poaching and habitat disturbance. The project also prioritised securing immediate conservation gains while generating baseline data to inform adaptive management and future conservation planning.

Over the project period from mid-2024 to the end of 2025, **162 painted terrapin nests (1,835 eggs)** and **five river terrapin nests (86 eggs)** were secured and incubated. The project achieved an **81% hatching success rate** for painted terrapins, resulting in **1,482 eggs successfully hatched**, while river terrapins recorded a **35% hatching success** producing **16 hatchlings**. Despite historical gaps in monitoring and on-going challenges related to egg collection, the project successfully secured all available eggs, preventing losses that would otherwise have been vulnerable to illegal collection and consumption. In parallel, **14 awareness activities** and **two capacity-building sessions** were conducted, reaching **more than 700 participants** and strengthening public awareness, local capacity, and stewardship for terrapin conservation. Educational materials, including flyers and stickers which produced under this project were distributed, while hands-on learning sessions at the Kontena Tuntung gallery further enhanced public engagement and outreach.

Despite challenges such as historically low nesting numbers, restricted access to tendered beaches, and occasional inconsistencies in egg handover, the project maintained a continuous conservation presence at the sites. **Donor support proved instrumental** in maintaining monitoring and hatchery operations, enabling the protection of all available eggs during the project period, and **strengthening collaboration** with local communities and partner agencies. Overall, the project delivered **measurable conservation outcomes**, mitigated immediate threats to terrapins, and established **critical baseline data** to inform and support long-term conservation efforts in Terengganu.

1. Background & Rationale

1.1 Painted terrapin

The painted terrapin (*Batagur borneoensis*), also locally known as *tuntung laut* in Malaysia, is a critically endangered freshwater turtle species native to Southeast Asia, including Malaysia, Thailand, and Indonesia. Known for the striking white and red patterns that males display during mating season, these terrapins primarily inhabit coastal river systems and migrate between freshwater rivers and estuarine areas. They play an important ecological role as seed dispersal agents in the ecosystem by helping to maintain the balance of aquatic vegetation, contributing to the health of riverine and associated ecosystems.

1.2 River terrapin

The river terrapin (*Batagur affinis*), known as *tuntung sungai* in Malay, is a critically endangered freshwater turtle species found primarily in riverine and estuarine environments across Southeast Asia, including parts of Malaysia, Thailand, and Cambodia. Unlike other turtle species, river terrapin is well adapted to freshwater and brackish systems, whereby it forages on aquatic vegetation and other organic matters. During the nesting season, river terrapins migrate to sandy riverbanks to lay their eggs, which are buried and incubated naturally by the heat of the sand.

1.3 Threats to terrapins

The primary threats to terrapins include habitat loss, illegal egg collection, and the poaching of adult terrapins for meat, particularly during the nesting season. Sand mining, river pollution, and land development along riverbanks also impact their nesting sites, reducing the availability of suitable and safe places for laying eggs. Additionally, climate change and rising temperatures can affect the sex ratio of hatchlings, as warmer nest conditions tend to produce more females, disrupting population balance over time.

1.4 Conservation Efforts by WWF-Malaysia

Conservation efforts are underway to protect terrapins across various regions in Malaysia. In areas like Setiu in the state of Terengganu, WWF-Malaysia has been conducting these activities since the 1990s. With more recent expansion of efforts to Kuala Kerteh, WWF-Malaysia hopes to increase the population of river and painted terrapins in the wild, thereby helping to rejuvenate their numbers and improve their conservation status. Our programs focus on monitoring and protecting nesting sites, engaging local communities in conservation, and raising public awareness about the importance of this species. WWF-Malaysia is not alone in these efforts; we collaborate with local organizations and government agencies to safeguard nesting beaches, operate hatcheries, and address key threats to the species. Through these combined efforts, all parties involved strive to restore terrapin populations and safeguard their habitats for future generations.

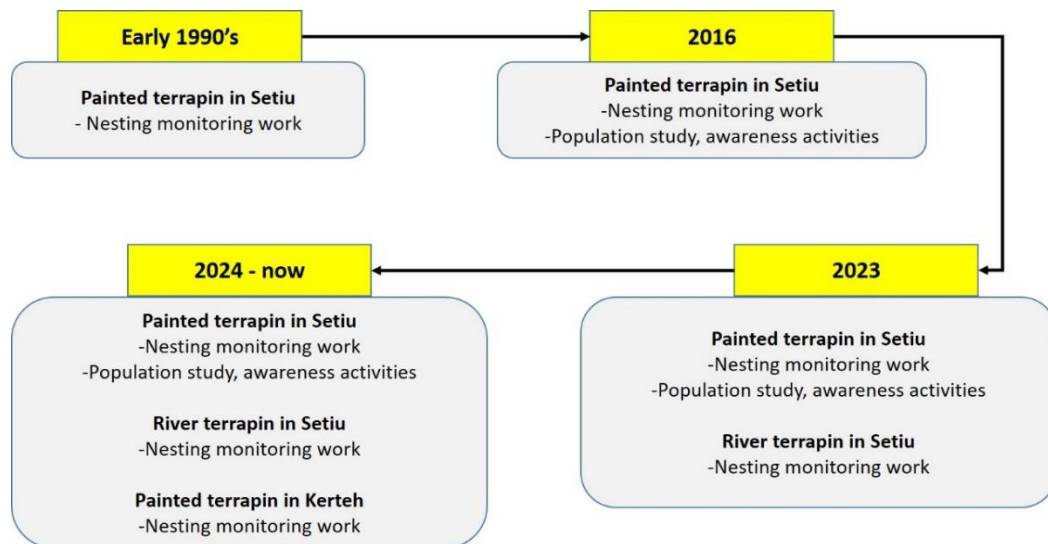


Figure 1: Progress of WWF-Malaysia's Terrapin Conservation Project in Terengganu.

1.5 Kontena Tuntung Information Gallery

Kontena Tuntung in Kampung Mangkok, Setiu, Terengganu, functions as an educational and awareness centre dedicated to the conservation of the painted and river terrapins. It serves as an interactive space where visitors can learn about this critically endangered species, their nesting habitats, and the conservation efforts taken by WWF-Malaysia to protect them.

This centre, set up by WWF-Malaysia with funding from CIMB Islamic Bank and officially launched in September 2021, serves as a hub for conservation awareness. The centre features educational displays, conservation information, and replicas or visuals related to the terrapin's lifecycle and threats. By providing a space where both locals and visitors can engage with conservation topics, the Kontena Tuntung helps build community support for terrapin conservation while raising awareness of Setiu's unique biodiversity.

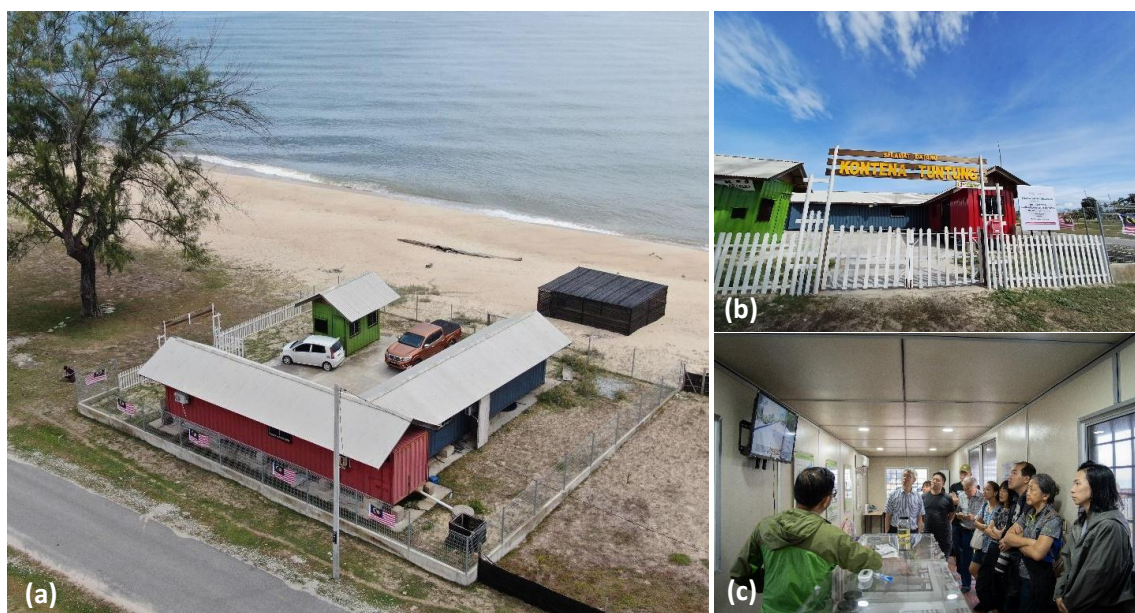


Figure 2: (a) Aerial view of the Kontena Tuntung in Kg. Mangkok, Setiu, Terengganu; (b) Front view of the Kontena Tuntung; (c) Internal view of the Kontena Tuntung.

2. Project Objectives

Objectives of the project are:

- To establish critical baseline data for river terrapins in Setiu River, Terengganu.
- To establish critical baseline data for painted terrapins in Kuala Kerteh, Terengganu.
- To enhance awareness, knowledge and capacity of target community groups.

3. Summary of Activities

3.1 Beach patrolling and hatchery operation

Regular beach patrolling was conducted throughout the nesting season at key nesting sites for both terrapin species in Setiu and Kerteh. For river terrapin in Setiu, the nesting season occurs from January to March while painted terrapin in Kerteh from June to August. Patrolling activities were carried out nightly throughout the nesting season to detect nesting activity, secure eggs, and directly deter poaching.

Nest locations were recorded with Geographical Positioning System (GPS). Once nests were detected, eggs were carefully taken out from the original nests in the nesting beaches/riverbank and transported and incubated at the designated hatchery at each project site. Hatchery operations included nest labelling, monitoring of incubation conditions, predator control and routine maintenance of hatchery infrastructure. This hatchery remains operational until all nests have fully hatched.

River terrapin eggs typically begin hatching after 55-60 days of incubation, while painted terrapin need a longer period and will start to hatch after 90 days. All the hatchlings will be released to the river once their body parts are fully developed.



Figure 3: Hatchery constructed for the incubation of terrapin eggs.

3.2 Community Engagement

Local community members were actively engaged as rangers and hatchery workers, playing a critical role in daily conservation operations. Selected community members were trained and employed to support beach patrolling, hatchery management and basic data recording.

This approach not only strengthened on-ground conservation capacity but also fostered a sense of ownership and responsibility among the local community towards terrapin protection. Community involvement helped improve local surveillance, reduce the risk of illegal egg collection and ensure timely response to nesting events.

Through this project, a new collaboration was initiated with beach tenderers to secure eggs from nesting beaches that are classified as tendered beaches. A tendered beach is leased to members of the local community through a formal tendering process. The leaseholder of the beach is granted the right to control access and may impose restrictions on other parties entering the beach. According to the terms of the lease, leaseholders are required to sell all eggs collected from the beach to the DOFT and regularly update the DOFT with nesting data from their respective areas. However, due to the low purchase price offered by the DOFT, many leaseholders prefer to sell the eggs through illegal channels and withhold accurate nesting data. As a result, nesting activity is under-reported, leading to artificially low official records. This in turn contributes to the continued classification of these sites as tendered beaches in subsequent years, **despite high actual nesting activity in the area**, thereby undermining conservation efforts.

Under this project, Kuala Kerteh beach was one of tendered beaches and has recorded high nesting activity of painted terrapins over the past two years. WWF-Malaysia received approval from the DOFT to purchase eggs from the leaseholder in this area. Following discussions with the leaseholder, both parties mutually agreed to collaborate at this site. All painted terrapin eggs collected from this beach were sold to WWF-Malaysia, and the eggs were subsequently transferred to a designated hatchery for incubation.



Figure 4: Local communities and WWF-Malaysia's officers involved in this project; (a) Year 2024; (b) Year 2025.

3.3 Awareness and Capacity Building

Awareness and capacity building activities were implemented to improve understanding of terrapin conservation among local stakeholders, communities and relevant partners, including students. These activities included briefings at project sites, hands-on training for hatchery work, and knowledge sharing on terrapins through awareness talks, exhibitions, events and the production of educational materials.

Capacity building, on the other hand, focused on improving technical skills related to nest handling, hatchery management, basic monitoring techniques, and adherence to standard operating procedures. Project staff and community members benefited from a series of training sessions delivered through hands-on field experience and mentoring by experienced practitioners.

These efforts helped ensure that conservation activities were carried out consistently and according to best practices, while also building long-term local capacity to support terrapin conservation beyond the project period.

3.4 Partnerships & Government Engagement

The project was implemented in close collaboration with relevant government agencies, local authorities and strategic partners to ensure compliance, effective implementation, and alignment with conservation priorities.

Key contributions included:

No.	Agencies/ Partners	Roles
1.	Department of Wildlife and National Parks (PERHILITAN)	Provision of permits and authorisation to carry out conservation activities involving protected wildlife.
2.	Department of Fisheries Terengganu (DOFT)	Permission and coordination to conduct conservation and monitoring activities at designated terrapin nesting beaches.
3.	Local District Authorities	Information sharing and coordination to support smooth project implementation at the district level.
4.	Royal Malaysia Police (PDRM)	Provision of safety and security coordination support to safeguard project personnel, participants and activities at the project site.
5.	University Sultan Zainal Abidin (UniSZA)	Technical advice, scientific input, and expert guidance to strengthen monitoring and implementation.

These partnerships ensured that project activities were carried out responsibly, safely, and in accordance with regulatory requirements, while benefiting from multi-disciplinary expertise and institutional support.



Figure 5: Discussion between the Director of PERHILITAN Terengganu and representatives from WWF-Malaysia.



Figure 6: Meeting between the Director of Fisheries Terengganu and representatives of WWF-Malaysia.



Figure 7: Expert guidance and awareness support provided by the UniSZA team to WWF-Malaysia's terrapin conservation efforts.

4. Project Location



Figure 8: Map showing the location of Terengganu in Malaysia (orange colour).

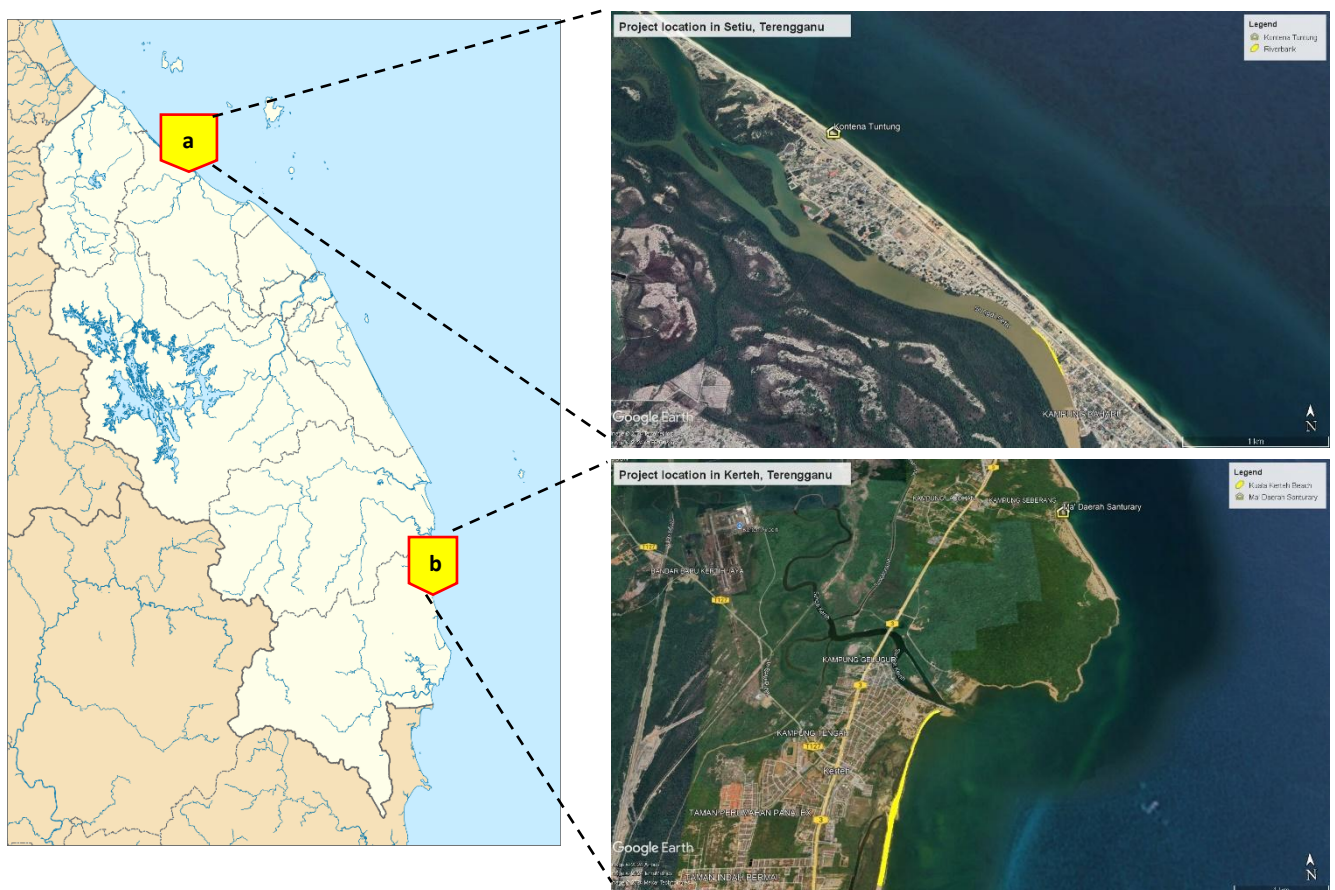


Figure 9: Project locations in Terengganu: (a) River terrapin project in Setiu, Terengganu; (b) Painted terrapin project in Kerteh, Terengganu.

**The Kontena Tuntung and Ma'Daerah Sanctuary accommodate the hatchery facilities for the respective project areas.*

5. Results & Outcomes

The grant has significantly contributed to the conservation of painted terrapins in Kerteh and river terrapins in Setiu by enhancing nest protection, hatchery management and community engagement. Although originally planned as a one-year project, the funding enabled the successful implementation of activities over a two-year period.

5.1 River terrapin project in Setiu, Terengganu

The river terrapin nesting monitoring project was conducted during the 2024 and 2025 nesting seasons, which span from late January to June, with a focus on the primary nesting site in Setiu, known as Tebing Penarik.

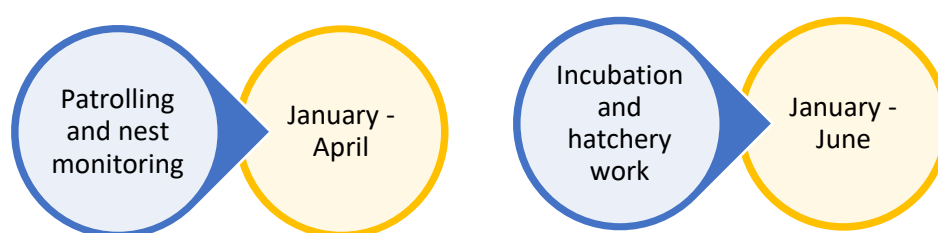
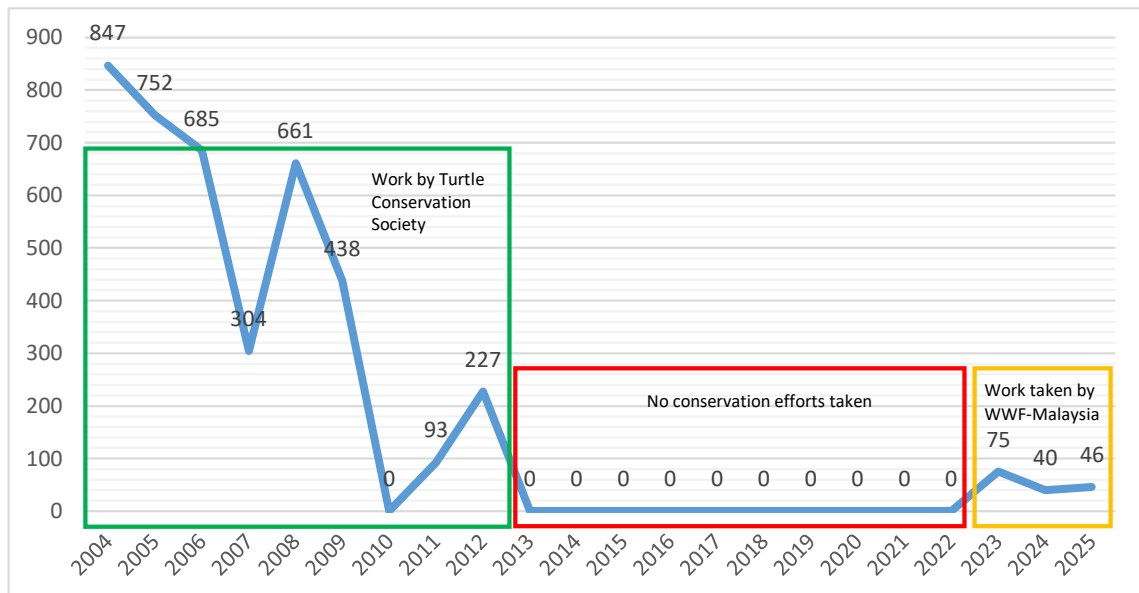


Figure 10: Timeline for river terrapin project in Setiu.

Four (4) local community members—two rangers and two hatchery workers—were hired to support the project. The rangers were responsible for patrolling a 1,000-meter stretch along the riverbank and collecting any eggs found during their shifts. All collected eggs were transferred to the hatchery for incubation. Table 1 showed the nesting data recorded over the two-year project under this grant.

Table 1: Nesting data of river terrapins in Setiu for 2024 and 2025.

Year	2024	2025
Number of nests	2	3
Number of eggs	40	46
Number of hatchlings	0	16
Hatchling rate (%)	0%	35%
Manpower / Community involvement (number of pax)	4	4



Graph 1: Nesting trend of river terrapins in Setiu from 2004 to 2025.

Based on Graph 1, **86 river terrapin eggs** were collected and incubated over the two-year project period. This represents a relatively low number compared to earlier conservation efforts conducted by other NGO between 2004 and 2012, which were eventually discontinued due to declining nest numbers, poor hatching success, and limited community support.

Between 2013 and 2022, no formal and systematic nesting data were recorded, as no conservation programme was in place. Community reports indicated that nesting still occurred during this period, although at low numbers and most, if not all eggs were believed to have been taken by villagers for consumption, posing a threat to the species' long-term survival.

In 2023, WWF-Malaysia, which has a strong focus on painted terrapins in the area, included river terrapins as a priority species. This initiative aimed to maintain the remaining population and prevent local extinction. Despite on-going challenges, the project successfully secured all available eggs within the project area, enabling hatchlings to be produced and released, thereby contributing to the continued conservation of river terrapins in Setiu.

The low number of nests recorded is likely the result of long-term egg harvesting, habitat modification along the riverbanks, and the small size of the remaining breeding population, compounded by a prolonged absence of protection and monitoring efforts. Some nestings were also reported nesting outside the designated monitoring area.

Hatching success was also very low, with several factors that may have contributed to this outcome, including:

1. Inexperience or immaturity of the female terrapins.
2. Possibility of limited number of male individuals affecting fertilization rates.
3. Potential bacterial contamination in the hatchery area affecting egg viability.
4. Predation by ghost crabs as evidenced by three missing eggs from one nest, and the presence of a deep hole beneath the nest, suggesting crab activity.



Figure 11: (a) A female river terrapin spotted after laying eggs on the nesting riverbank; (b) Eggs of river terrapin removed from their original nests and prepared to be transferred to the hatchery for incubation.



Figure 12: Several eggs were observed to have decomposed after 60-70 days of incubation in the hatchery.

5.2 Painted terrapin project in Kerteh, Terengganu

The painted terrapin nesting monitoring project in Kuala Kerteh, Terengganu, was conducted from June to November in 2024 and 2025. The nesting beaches in this area span approximately 9 km; however, the project team concentrated the patrolling efforts only **on a 3-km nesting hotspot** for this species.

Since Kuala Kerteh is a new project site, several site visits were conducted to assess beach conditions and engage with local community members who could be hired to assist with the project.

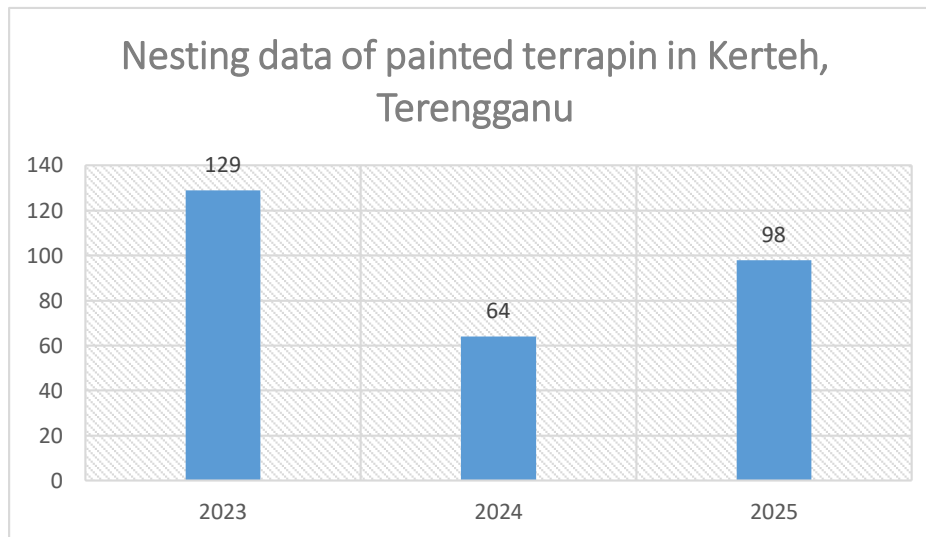
Initially in 2024, two rangers and one hatchery worker were hired from early July to the end of the project. However, due to unforeseen circumstances, the two rangers were terminated by mutual agreement. This decision followed the tenderer's unwillingness to collaborate with the rangers for personal reasons. As an alternative, the team hired a project assistant from outside the local area to replace the two rangers. This adjustment helped preserve a positive relationship with the tenderer, who then allowed the continuation of our patrols and egg collection on the beach. The tenderer also permitted the project to purchase the collected eggs, though all activities on the beach would be managed by him.

In 2025, the project was implemented using the same methods and operational arrangements as in the previous year. However, the project team encountered a new challenge during the early stage of the project when another NGO operating nearby offered a higher price for turtle and painted terrapin eggs. This situation created an incentive for the beach tenderer to sell eggs to that party instead of the project team, despite the project team having mandate from the Department of Fisheries Terengganu to manage conservation activities in the area.

To address this issue and ensure complete and consistent nesting data for the area, the project team introduced an additional incentive mechanism to encourage the beach tenderer to sell all collected eggs to the project team. This approach enabled continued nest protection, maintained data integrity and ensured that all nesting activities in the area were properly recorded. The issue was resolved once the beach tenderer responded positively to the revised incentive arrangement.

Table 2: Nesting data of painted terrapins in Kerteh for 2024 and 2025.

Year	2024	2025
Number of nests	64	98
Number of eggs	585	1250
Number of hatchlings	467	1015
Hatchling rate (%)	80%	81%
Manpower / Community involvement (number of pax)	3	3



Graph 2: Nesting trend of painted terrapins in Kerteh, Terengganu.

In **2024**, a total of **64 painted terrapin nests containing 585 eggs** were collected and incubated, while in **2025, 98 nests** comprising **1,250 eggs** were recorded over the two-year project period. The findings showed that the number of eggs per clutch ranged between 5 to 15 eggs. Of the total eggs incubated, **467 eggs (80% hatching success)** in 2024 and **1,015 eggs (81% hatching success)** in 2025 successfully hatched into hatchlings, while the remaining eggs did not hatch.

As noted earlier, this beach area represents a relatively new project site for the team. In 2023, conservation activities at this site were initiated by colleagues from the Marine Programme before being transferred to our programme to ensure continuity in 2024 and 2025. Prior to 2023, no formal nesting data were recorded, as egg collection and management were believed to have been carried out by the beach tenderer without systematic monitoring, and the data were not formally reported to the Department of Fisheries Terengganu. Despite this, accounts from local community members consistently indicate that the area supports high painted terrapin nesting activity almost every year.

Based on the Graph 2, the nesting trend did not show any significant change over the three-year project period. Several factors may have contributed to the unhatched eggs, including:

1. Predation observed in the hatchery area by crabs, rats, and ants, with evidence of missing body parts in some hatchlings, such as heads and limbs.
2. Potential presence of bacteria in the hatchery area.
3. Sand type unsuitable for nesting and incubation.



Figure 13: Female painted terrapins spotted on the nesting beach after laying their eggs.



Figure 14: Eggs collected from the nesting beach were counted for confirmation before being reburied in the sand.



Figure 15: Some of the eggs has developed into embryo but not survive because of the predation possibly by the crabs and rats from under the nests.

5.3 Awareness activities and capacity building

A total of **14 awareness activities** and **two (2) capacity-building** sessions were conducted throughout the project period. Awareness activities included talks, hatchling release programmes, sharing sessions, and a series of exhibitions. Through these activities, **752 participants** from various groups – including secondary school students, local institutions, government agencies, and local communities – were reached. In addition, numerous groups visited the project’s information gallery, Kontena Tuntung. Throughout these activities, the project promoted terrapin conservation efforts and acknowledged the support and contribution of the Mohamed bin Zayed Species Conservation Fund.

Two capacity-building sessions on best hatchery practices were conducted for hired hatchery workers, project assistants, and internship student. These sessions were held prior to the start of the project and were facilitated by the project team in collaboration with experienced hatchery workers from the Setiu site. In addition, **two educational and awareness materials** - a flyer and a set of stickers- were produced and distributed during awareness activities to further support outreach and education efforts.

Table 3: List of activities, events and capacity building conducted throughout the project.

No.	Activities/Events/Capacity Building	Date	Number of participants
2024			
1.	Awareness talk and Hatchling Release Event in conjunction with the technical visit of the Malaysia SDG Summit 2024	18 May 2024	80
2.	Exhibition for Silver Jubilee Celebration of Ma’ Daerah, Terengganu	10-12 August 2024	200
3.	Capacity Building: Hatchery Management Workshop	28 August 2024	7
4.	Awareness talk and Hatchling Release event for Setiu Cakna Alam Sekitar 2024	10 October 2024	40
5.	Awareness talk and Hatchling Release event for Terengganu Eco-Fest 2024	26 October 2024	25
6.	Awareness talk, hatchling release and plogging for Tuntung Edu-Rescue event	29 November 2024	70
TOTAL			422
2025			

7.	Exhibition for National Science Week East Zone 2025	24 – 26 June 2025	*5,000
8.	Capacity Building: Hatchery Management Workshop	30 June 2025	10
9.	Madani Tour IPGM East Zone 2025	17 July 2025	60
10.	Exhibition during World Ranger Day Celebration 2025	31 July 2025	80
11.	Sharing session during eDNA presentation session	20 August 2025	30
12.	Eco Talk and hatchling release : Terrapin Conservation Story - Terengganu Eco-Fest	4 October 2025	20
13.	Awareness talk and hatchling release with Geng Plastik Ija	18 October 2025	20
14.	Awareness talk and hatchling release with Geng Plastik Ija 2.0	30 October 2025	30
15.	Awareness talk for Kita & Tuntung event with UniSZA	15 November 2025	30
16.	Awareness talk for Terengganu Setiu Wetlands Camp 2025	4 December 2025	50
TOTAL			330
GRAND TOTAL			752

**Figure showed official number of participants visited Terengganu Science Centre for the whole National Science Week East Zone 2025.*

6. Challenges & Mitigation

6.1 Changes in Staffing Plans for Nesting Beach Patrols

Initially, the project planned to hire two rangers in Kerteh to patrol and monitor the nesting activities on the beach. However, these hiring plans were cancelled when the leaseholder did not agree to collaborate with the hired rangers due to personal issues. The status of tendered beach gives the right to the leaseholder to restrict the access to the beach making the need for rangers less viable. Besides that, there is a plan to hire a hatchery worker for six months to monitor all nests in the hatchery. However, this hiring lasted for two months only due to bad performance and poor commitment given by the hired worker.

As an alternative, the budget originally allocated for the two rangers and one hatchery worker was redirected towards hiring a single project assistant. This adjustment allowed the project to maintain oversight and ensure continued data collection while staying within the permitted boundaries set by the beach's tendered status.

6.2 Challenges working and collaborating with leaseholders

6.2.1 Concerns regarding the integrity and transparency of the beach tenderer

These were identified during project implementation. No eggs were submitted to the project team during weekends, raising questions about the completeness of egg collection and reporting. In addition, it is believed that not all eggs laid were handed over to the project team, as access to the beach during night-time—when nesting typically occurs—was not permitted for project patrols. This limitation reduced the team’s ability to independently verify nesting activities and egg collection.

6.2.2 Operational inefficiencies in egg handling and management

These were also observed. Eggs were believed to be mixed between different nests, as indicated by noticeable variations in egg size, resulting in incomplete or less reliable nesting data. Furthermore, eggs were transported in plastic bags, which is not an appropriate handling method, as vibration and movement during transportation may negatively affect egg viability and reduce hatching success rates.



Figure 16: Eggs were collected by the leaseholder and packed in plastic bags. This practice may negatively affect hatching success, as vibrations during transport to the hatchery can cause damage to the eggs. As a result, some eggs were found broken upon arrival at the hatchery prior to incubation. The use of pails or other suitable containers is recommended to minimise vibration and reduce egg damage.

6.2.3 Market price

Although initial approval had been obtained from the leaseholder, we faced unexpected difficulties when he chose to sell the terrapin eggs to other buyers who offered a higher price. This situation disrupted our planned egg acquisition and required us to allocate additional budget to provide fair incentives, ensuring that the leaseholder remains motivated to sell the eggs to WWF. This challenge highlights the ongoing issue of fluctuating market demand and the need for competitive community-based incentive structures to secure conservation outcomes.

6.3 Eggs loss during incubation due to predation

We experienced several cases of egg damage during the incubation period at the designated hatchery. Predators such as rats and crabs managed to access the hatchery area, resulting in eggs being eaten or damaged before hatching. This indicates gaps in the current hatchery protection structure and highlights the need to reinforce physical barriers, improve maintenance routines, and enhance predator-proofing measures to ensure better egg survival in future seasons.

6.4 Low spending rate due to collaborative awareness events

The relatively low spending rate for awareness activities is attributed to the implementation of several programmes through collaboration with strategic partners/ organisations. In many cases, key costs such as venue, logistics, and materials were shared or fully covered by partners, resulting in lower project expenditure than initially planned. This collaborative approach enabled the project to maximise resources and deliver a greater number of awareness activities with wider outreach and impact, despite reduced spending.

6.5 Limited Internship Applications

The project also allocated a portion of the budget for hiring internship students, who would assist with fieldwork and data collection, offering valuable support during peak activity periods. However, within this period, no suitable internship application was received. As a result, the funds designated for intern support have not yet been spent. Plans are underway to expand recruitment efforts to fill these roles, which will help improve project's river terrapin conservation efforts for next year and achieve targeted outcomes.

The project allocated a portion of its budget to recruit internship students to assist with fieldwork and data collection, providing valuable support during peak activity periods. Although no suitable applications were received initially, the team later successfully recruited two interns during the project period. Their involvement contributed positively to ongoing activities, particularly in supporting field operations.

The remaining balance originally allocated for internship allowances was redirected to support awareness programmes, helping to strengthen outreach efforts and enhance the overall impact of the river terrapin conservation initiative.

7. Financial Summary

Expenses	Amount (US)	Amount (RM)
River terrapin project In this project, the expenses were spent for hiring local communities (as rangers, hatchery workers and project assistants), hatchery development and management, and purchasing items for supporting the project.	11,000	51,370
Painted terrapin project In this project, the expenses were spent for site visits, hiring local communities (as rangers, hatchery workers and project assistants), hatchery development and management, eggs buy back with incentives, and purchasing items for supporting the project.	11,000	51,370
Awareness activity In this activity, the expenses were spent for event preparation and capacity building (including meals, banner and certificate printing, and accommodation) and designing and production of materials (i.e. flyer and stickers).	2,000	9,340
Miscellaneous Under this section, the expenses were spent for supporting and maintaining the operation of the Kontena Tuntung (including annual fees for the temporary occupancy of land and building, painting work and monthly electricity bill) and maintaining the project car.	1,000	4,670
GRAND TOTAL	25,000	116,750

8. Recommendations / Way Forward

8.1 Continue nesting monitoring in the next nesting season

Continued and sustained monitoring of nesting activity is essential to establish and strengthen baseline data for river terrapin in Setiu and painted terrapin in Kerteh. Consistent data collection over multiple seasons will allow the project team to identify trends in nesting frequency, hatching success, and emerging threats. This information is crucial for adaptive management, planning future interventions, and demonstrating measurable conservation outcomes to stakeholders and donors.

8.2 Pursue designation of Kerteh nesting beach as reserved beach

Designating the nesting beach as a reserved beach and give mandate to project team to monitor the beach would allow better management to be conducted. The project team would ensure more effective and efficient monitoring, standardised egg collection, and better protection of nests. A reserved status would also enable stronger enforcement, reduce egg loss, and facilitate consistent application of conservation protocols, thereby improving overall project impact.

As a note, in December 2025, the project team developed and submitted a recommendation paper to the Department of Fisheries Terengganu proposing the reclassification of Kerteh Beach as a reserved beach to enable better management of painted terrapins in the state. The team hopes to receive positive feedback from them.

8.3 Regular participation of enforcement agencies in nesting sites

Regular participation of relevant enforcement agencies in monitoring activities, particularly during peak nesting seasons, would strengthen on-ground presence and act as an effective deterrent against illegal egg collection. Consistent visibility and engagement would support compliance, reduce poaching risks, and complement ongoing conservation efforts by the project team.

8.4 Legal awareness and compliance

Future awareness efforts should include greater emphasis on sharing information about the legal protection status of both terrapins and relevant regulations. Enhancing community understanding of these provisions can help encourage responsible behaviour and strengthen local support for conservation initiatives.

8.5 Sustaining funding support

Securing sustained funding is essential to ensure the continuity of conservation efforts for both terrapin. Continuous financial support will enable consistent monitoring, hatchery operations, enforcement coordination and expanded awareness initiatives. In addition, stable funding will allow the project to sustain core activities, strengthen partnerships, and build long-term data sets necessary to demonstrate impact and support adaptive management.

9. Annexes

Photographic documentation of Awareness and Capacity-Building Activities

1) Awareness Talks



Photo a: Awareness talk on terrapin conservation work by WWF-Malaysia and PERHILITAN during a technical visit of Malaysia SDG Summit 2024 which attended by various sectors, including federal agencies, state agencies, private sectors, and tourism stakeholders around Terengganu - 18 May 2024.

Photo b: Awareness talk on terrapin conservation work by WWF-Malaysia during a Terengganu Eco Festival 2025 which attended by state and district agencies, institutions, and tourism players and local community around Terengganu - 4 October 2025.

2) Hatchling Release Programmes



Photo a: Hatchling release programme with community from Kerteh area -18 October 2025.

Photo b: Representative from WWF-Malaysia deliver a short briefing with the Setiu community before hatchling release activity - 26 October 2024.

3) Exhibitions and Events



Photo a: The Chief Minister of Terengganu, YAB Dato' Dr. Ahmad Samsuri Mokhtar and the Minister of Science, Technology and Innovation Malaysia visited WWF-Malaysia's booth during the National Science Week (East Zone) 2025 – 24 June 2025.

Photo b: Tuntung Edu-Rescue was a collaborative event between WWF-Malaysia and the ALPHA Club from Universiti Sultan Zainal Abidin (UniSZA). The programme involved 40 secondary school students and featured several pocket activities including awareness talks, plogging, hatchling release and tree planting – 29 October 2024.

4) Kontena Tuntung visits



Photo a: A sharing session on terrapin conservation work was conducted at the gallery area for a group of researchers – 4 September 2025.

Photo b: Students from IPGM were given the opportunity to visit the hatchery during the incubation period and learn about the hatchery management practices – 17 July 2025.

5) Capacity building – Best Hatchery Practices



Photo a: Participants of the training attended a theory session with experienced hatchery workers (Photo a) followed by a practical session at the hatchery (Photo b). They were taught proper nest excavation techniques and correct egg arrangement.

6) Awareness materials

JOM KENALI TUNTUNG

TUNTUNG ialah spesies penyu air tawar bercengkerang keras yang hidup di ekosistem air payau dan air tawar.

Tuntung dikategori sebagai **TERANCAM KRITIKAL** dalam Senarai Merah IUCN.

Di Malaysia, tuntung dilindungi di bawah Akta Pemuliharaan Hidupan Liar 2010.

TABURAN TUNTUNG DI MALAYSIA

ANCAMAN TERHADAP TUNTUNG

- Kecurian telur
- Guna tanah yang tidak terkawal
- Penggunaan alat menangkap ikan yang tidak terkawal
- Penyeludupan haram

PERANAN TUNTUNG TERHADAP EKOSISTEM

- Berfungsi sebagai bio-indikator kesihatan sungai.
- Ejen penyebaran biji benih tumbuhan.
- Mengawal pemangsa di dalam rantai makanan.

Spesies tuntung di Setiu, Terengganu

- Tuntung sungai *Batagur affinis*
- Tuntung laut *Batagur borneoensis*

Projek pemantauan sarang

- Bertujuan menyelamatkan sarang tuntung di pantai dan sungai daripada ancaman pemangsa termasuk manusia.
- Aktiviti termasuklah rondaan pantai dan sungai, pengutipan telur, di hancir dan pelepasan anak ke sungai.

Kajian populasi

- Bagi mengenalpasti populasi semasa tuntung di Sg. Setiu.
- Kaedah mark-capture-recapture.
- Mikrochip digunakan sebagai tanda pengenalan.

Usaha konservasi WWF-Malaysia terhadap tuntung di Setiu, Terengganu

Program pendidikan dan kesedaran

- Sesi taklimat dan ceramah kesedaran.
- Pameran.
- Program pelepasan anak tuntung.

Advokasi kepada perlindungan

- Memberi input kepada agensi berkaitan bagi menambah baik perlindungan kepada spesies tuntung dan habitatnya.

Penubuhan Kontena Tuntung

- Sebagai pusat informasi dan galeri tuntung untuk orang ramai.
- Lokasi di Kg. Mangkok, Setiu, Terengganu.

Waktu operasi:

- Ahad - Khamis
- 10 pagi - 3.30 petang

Untuk sebarang pertanyaan lanjut, sila hubungi: 019-2414773/017-8815004 atau email: mzaid@wwf.org.my

Logos: WWF, JKKP, and PERHILITAN.

Figure 17: Flyers (with size A5) produced, printed and distributed to all participants who involved in our awareness activities.



Figure 18: Set of stickers produced, printed and distributed to all participants who involved with our awareness activities.



Figure 19: Banner produced with the donor's logo for any related awareness activities conducted in this project.

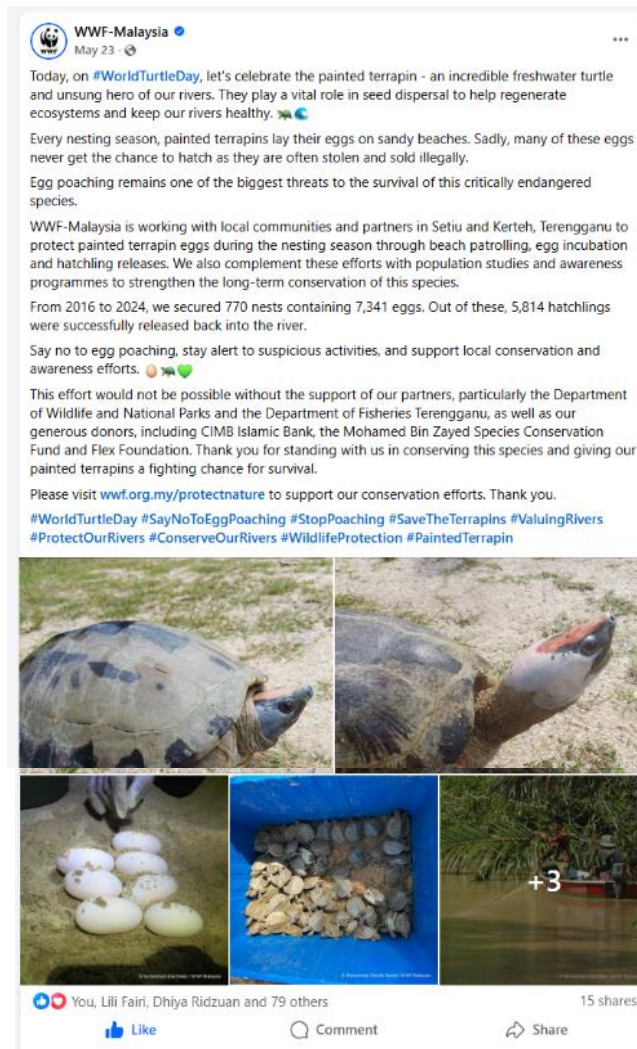


Figure 20: A social media posts by WWF-Malaysia on Facebook for World Turtle Day 2025 acknowledged the support of the Mohamed bin Zayed Species Conservation Fund in contributing to terrapin conservation efforts.

Reference: <https://www.facebook.com/share/p/1D5kKsTgPT/>



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