Perhentian Turtle Project

2019

FUZE ECOTEER

TOURISM MALAYSIA

PERHENTIAN TURTLE PROJECT

OVERVIEW

Who We Are

PERHENTIAN TURTLE PROJECT

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- Officially established in 2015 as a sea turtle research and conservation initiative, under Fuze Ecoteer Outdoor Adventures Sdn. Bhd., in the Perhentian Islands Marine Park.
- Currently based in Kampung Pasir Hantu (Fisherman's Village) on Perhentian Kecil and Pantai Tiga Ruang (Turtle Beach) on Perhentian Besar.
- Monitors sea turtle population through photographic identification (photo ID).
- Works with the support and collaboration of the Terengganu State Department of Fisheries (TDoF) as well as the Marine Park Division.
- Also works among and with the local community and stakeholders (e.g. dive centers and resorts) to create and raise sea turtle as well as marine conservation awareness.
- Hopes to facilitate better conservation practices among the Perhentian Community to better conserve the islands and their inhabitants.

OVERVIEW

Why PTP?

The Perhentian Islands, besides their natural beauty, are unique as they host both foraging and nesting populations of green turtles. Hawksbill turtles are also frequently sighted at coral reefs during dives. Despite being the state icon, natural heritage, and tourist attraction, there is a lack of data on the Perhentian Islands' sea turtle populations. Moreover, besides the Bubbles Dive Resort and local TDoF rangers - both of which focus their efforts on the nesting population - there are no other parties actively engaging in sea turtle conservation.

Thus, PTP was established with the hopes of addressing the lack of data by monitoring the foraging and nesting populations of sea turtles in the Perhentian Islands. We also hope to facilitate more conversation and relationships among stakeholders who are key to the success of any conservation efforts.

OVERVIEW

Aims and Objectives

Aim: To conserve the sea turtle population of the Perhentian Island Marine Parks by monitoring them via photo ID and increasing awareness as well as engagement among the Perhentian Community

Objectives:

- To estimate the Perhentian sea turtle population size and dynamics
- To identify the Perhentian sea turtle habitat use and connectivity
- To respond to and determine causes of Perhentian sea turtle strandings
- To create and raise awareness about sea turtles and marine conservation among the Perhentian Community (i.e. local community, stakeholders, tourists, and government)

OVERVIEW

Thank you

Our deepest gratitude goes to:

- our 2019 interns for your hard work, passion and dedication.
- our volunteers, groups, and visitors - without your contributions, our work would be impossible.
- the residents of Kampung Pasir Hantu for their patience, understanding, and knowledge. Special shout out to the boatmen for always being there whenever we need to get anywhere, and to the local TDoF rangers for allowing us to assist them in their jobs.
- our stakeholders for their support and constructive feedback that have fuelled our desire to be better at our work.
- the TDoF and Marine Park Division for permitting us to conduct our work
- the FE team for their support and motivation. Special shout out to Long Seh Ling and Wan Zuriana Wan Sulaiman for their advice that inspired and improved our ideas, and prevented us from re-inventing wheels.

OVERVIEW

Project Activities

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1. **In-water Surveys**: Identify foraging green turtles via photographs taken through kayak and snorkel surveys at Teluk Pauh
2. **Night Patrol**:
    a. Assist TDoF rangers to patrol Tiga Ruang
    b. Collect biometrics of nesting green turtles including photographs for photo ID
    c. Record nesting activities
3. **The Hatchery**: Assist TDoF rangers to relocate eggs, excavate nests, release hatchlings, and record hatchery activities
4. **Beach Clean-Ups**: Collect and separate rubbish from Perhentian beaches
5. **Public Outreach**:
    a. Conduct Turtle (Awareness) Talks
    b. Conduct Turtle Camps at Tiga Ruang
    c. Develop a Citizen Science Initiative where stakeholders are encouraged to contribute to the photo ID database by submitting turtle sighting photos
    d. Develop a Response Network for stakeholders to report turtle nesting and stranding activities

PROJECT OUTCOMES

1. In-Water Surveys

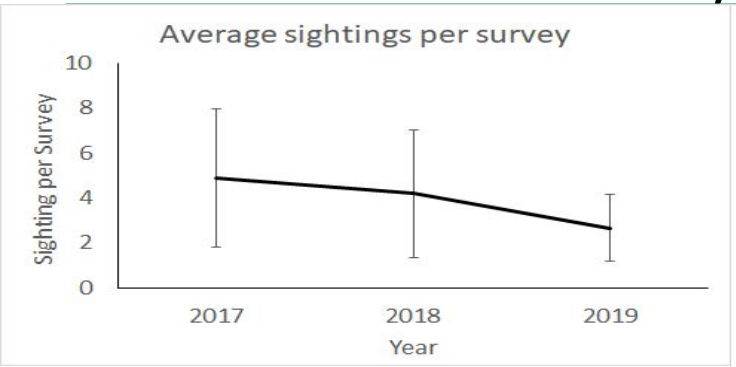

Figure 4: The average number of green turtle sightings per survey at Teluk Pauh. Error bars represent standard deviation.

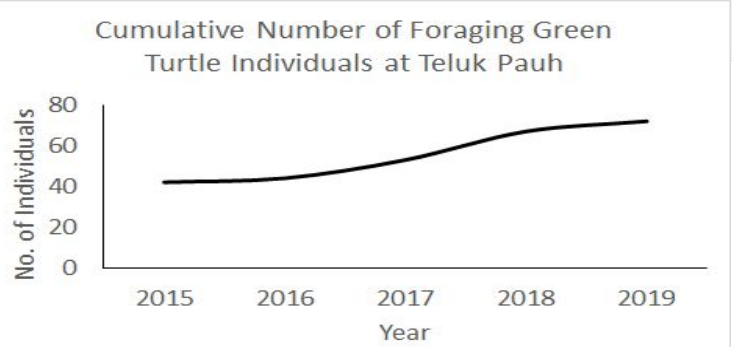

Figure 5: The cumulative number of foraging green turtles at Teluk Pauh.

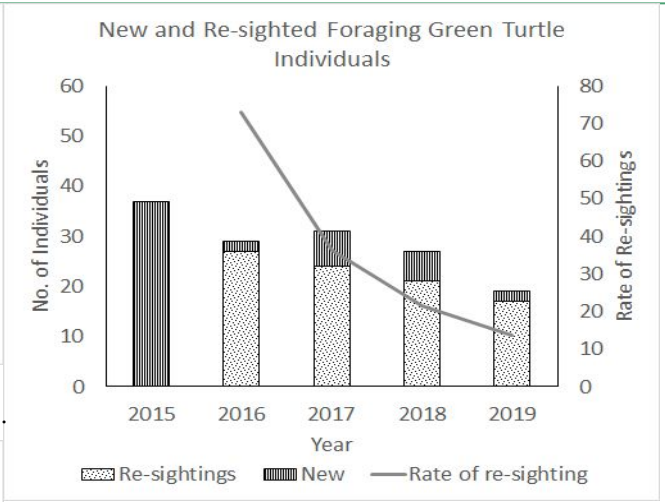

Figure 6: The number of new and re-sighted foraging green turtles at Teluk Pauh. The stacked bar graph corresponds to the left y-axis while the line graph corresponds to the right y-axis

- 2019: not as many sightings and individuals (new and re-sighted) sighted
- Maybe due to not as many surveys conducted compared to previous years (2019: 97, 2018: 133, 2017: 125)
- Rate of re-sighted individuals over the years decreasing drastically concerning
- Maybe due to individuals feeding at multiple sites

(1,5,6), decrease in Teluk Pauh's seagrass health (8), perhaps due to overgrazing (2), human overcrowding, differences in feeding times (4), or permanent emigration (including death).

PROJECT OUTCOMES

2. Night Patrol

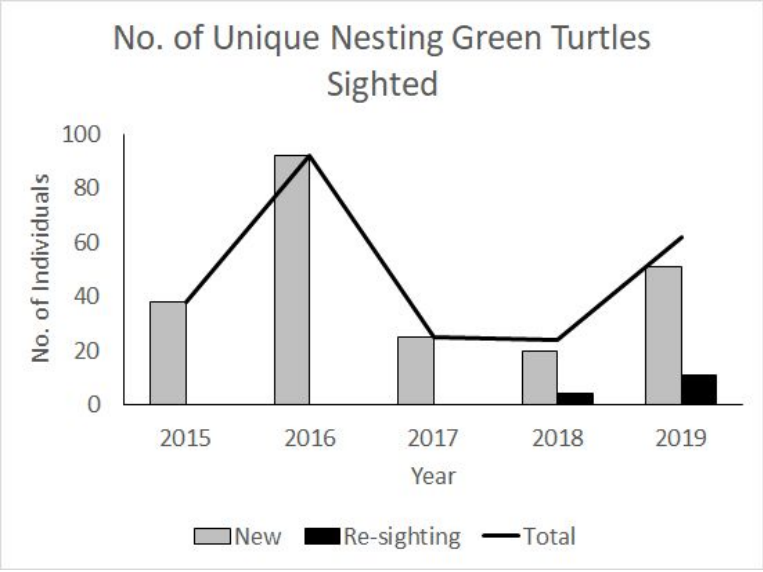

Figure 7: The number of nesting green turtles sighted at Tiga Ruang and the Bubbles Dive Resort.

- 2019 sighting trend was expected to be similar to that of 2016
- Sighted more individuals this year, but not as many nesting turtles compared to that of 2016
- Concerning that only 12% of those sighted in 2016 were re-sighted this year
- May be due to individuals having different nesting cycles (3), nesting at other beaches (7) or they are facing high mortality rates.

** data in Figure 7 consists only of individuals sighted at Bubbles Dive Resort and Tiga Ruang (except for 2017 which is only for Tiga Ruang) as those are the only two beaches where individuals are catalogued and past years have shown there are individuals that nest between the two beaches.*

PROJECT OUTCOMES

3. The Hatchery

Table 1: The number of nests and eggs relocated into the hatchery between 2015-2019.

Year	# Nests	# Eggs
2015	260	20723
2016	423	38360
2017	141	12544
2018	76	6924
2019	316	28801

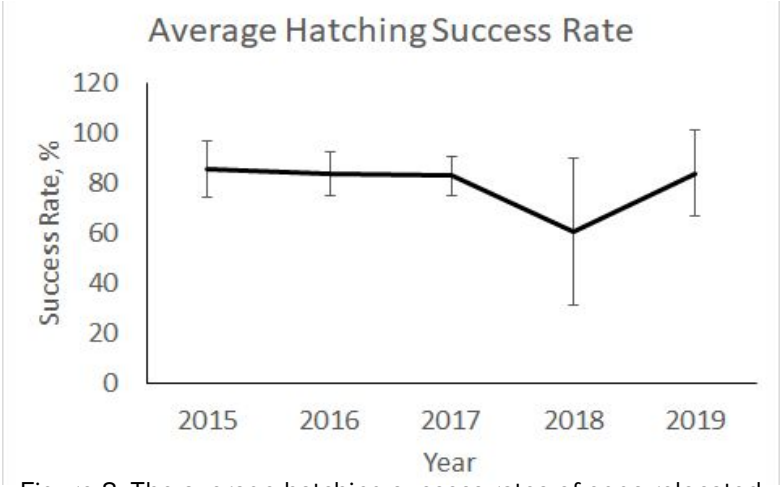

Figure 8: The average hatching success rates of eggs relocated into the hatchery. Error bars represent standard deviation

- 2019 nesting trend also expected to be similar to that of 2016
- Not as many nests relocated as 2016 but difference not as big as that of the number of individuals sighted
- Data doesn't include nests from the Bubbles Dive Resort but hatchery still received nests collected from ≤6 other beaches around the islands.
- Possible that nesting individuals were nesting at different locations than in the past.

PROJECT OUTCOMES

4. Beach Clean-Ups

Figure 1: Count of the most common categories of items collected from BCUs ranked from most to least.

- Conducted 23 Beach Clean Ups (BCUs) at 9 different beaches with the Perhentian Eco-Education Project and the Perhentian Marine Research Station.
- Total of 484 participants and overall rubbish weight of 458.76 kg.

PROJECT OUTCOMES

5. Public Outreach

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5(a) Awareness Campaigns

- Gave 28 talks (~1 per week from Mar-Sept)
- Hosted by 7 stakeholders: 5 dive shops and 2 resorts

5(b) Turtle camps

- 11 April – Junior (7-9 yo) Turtle Camp @SKPP & Village Beach
- 28-29 June – Senior (10-12 yo) Turtle Camp @ Tiga Ruang
    - 16 Students | 6 Project Staff | 4 Teachers
- 28-29 Sept – Senior (10-11 yo) Turtle Camp @ Tiga Ruang
    - 11 Students | 6 Project Staff | 3 Volunteers | 3 Teachers

PROJECT OUTCOMES

5. Public Outreach

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5(c) Citizen Science Initiative (CSI)

- To increase sea turtle sightings around the islands
- Engage tourists and stakeholders to join our photo-ID citizen science initiative to submit facial photographs of sea turtles sighted within the Perhentian Islands.
- Mainly for in-water sightings because:
  - tourists more likely to see turtles under instead of above water
  - mostly lack foraging turtle data
- Received submissions since 2015
- CSI contributed **3%*** of 3130 total sightings and **21%*** of the individuals in our database.

** only includes green turtle sightings*

PROJECT OUTCOMES

5. Public Outreach

Figure 9: The number of sea turtles we received and responded to between 2015-2019. Numbers do not reflect actual numbers of dead and injured individuals

5(d) Response Network

Strandings

- Received and responded to 16 reports of stranded turtles (dead or injured)
- 14 dead; 2 injured upon reporting
  - 1st injured turtle disappeared before we could get to it. O
  - 2nd injured turtle died after being rescued. It was a turtle from our database, Mila (PG0027U).

Nesting Activity

- Received and responded to reports of nesting events from locations other than those we and the TDoF rangers patrol
  - Long Beach - 8; Tuna Bay - 1; Rainforest Resort - 1

Conclusion

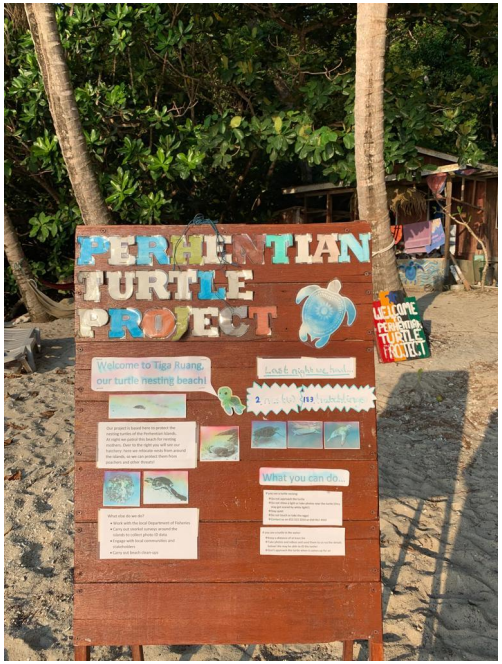
What we learnt

- In-water surveys need to be done more often more regularly during the season, and more consistently over the years so that it is easier to compare annual data
- The quality and frequency of awareness talks need to be maintained throughout the season
- Stakeholders need to be engaged frequently to ensure both parties stay up-to-date with the progress of any collaboration and projects such as the citizen science initiative and response network.
- The swap-over process between night patrol groups need to be more smooth to ensure all data and updates regarding the camp and hatchery at Tiga Ruang are handed over sufficiently by the outgoing group to the incoming group.
- Project equipment need to be well-equipped, upgraded and maintained for data collection and analysis to be accurate, efficient and productive

Conclusion

Next year and beyond

- Develop the Tiga Ruang Camp to include an education corner that focuses on the nesting part of a sea turtle's life cycle and the development stages from egg to hatchling
- Collaborate with the Island Watch Conservation Initiative to co-monitor the foraging population and tourist-turtle interaction at PIR
- Expand manpower either in terms of intern and volunteer numbers, research collaborations, and/or stakeholder involvement to expand in-water survey sites
- Survey seagrass beds for density, abundance, diversity, health and productivity to link with foraging population dynamics
- Increase citizen science photo submissions, especially encourage snorkel boatmen and divers.
- Satellite-track nesting individuals within the nesting season to determine nesting patterns



Conclusion

Reference List

(1) K. A. Bjorndal. Foraging ecology and nutrition of sea turtles. *In*: P. Lutz, and J. Musick (ed.),. *The biology of sea turtles*. Boca Raton, FL, USA: CRC Press, 1997, pp.199–232.

(2) M. J. A. Christianen *et al.* Habitat collapse due to overgrazing threatens turtle conservation in marine protected areas. *Proceedings of The Royal Society*, 2014. [Online] Available from: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3896025/. [Accessed 30 Dec 2019].

(3) G. C. Hays *et al.* Different male vs. female breeding periodicity helps mitigate offspring sex ratio skews in sea turtles. *Frontiers in Marine Science*, 2014, 1, pp.1–9.

(4) J. C. Ogden *et al.* Diel foraging patterns in juvenile green turtles (*Chelonia mydas L.*) in St. Croix United States Virgin Islands. *Journal of Experimental Marine Biology and Ecology*, 1983, 66, pp.199-205.

(5) J. A. Seminof *et al.* Home range of green turtles *Chelonia mydas* at a coastal foraging area in the Gulf of California, Mexico. *Marine Ecology Progress Series*, 2002, 242, pp.253–265.

(6) J. Senko *et al.* Immature East Pacific green turtles (*Chelonia mydas*) use multiple foraging areas off the Pacific coast of Baja California Sur, Mexico: first evidence from mark-recapture data. *Pacific Science*, 2010, 64, pp.125–130.

(7) A. D. Tucker. Nest site fidelity and clutch frequency of loggerhead turtles are better elucidated by satellite telemetry than by nocturnal tagging efforts: Implications for stock estimation. *Journal of Experimental Marine Biology and Ecology*, 2010, 383, pp.48-55.

(8) S. D. Whiting *et al.* Short term foraging ranges of adult green turtles (*Chelonia mydas*). *Journal of Herpetology*, 1998, 32, pp.330–337.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