



SEA VOICE DIVERS (KT0389165-M)

Black Tip Reef Shark Sighting in Perhentian Island, Malaysia.

Abstract

This study is collect data and to futher understand the behavior of the Black Tip reef shark around Perhentian Island, Malaysia. As apex predators, sharks play an important role in the ecosystem by maintaining the species below them in the food chain and serving as an indicator for ocean health. They help remove the weak and the sick as well as keeping the balance with competitors helping to ensure species diversity.

As predators, they shift their prey's spatial habitat, which alters the feeding strategy and diets of other species. Through the spatial controls and abundance, sharks indirectly maintain the seagrass and corals reef habitats. The loss of sharks has led to the decline in coral reefs, seagrass beds and the loss of commercial fisheries.

By taking sharks out of the coral reef ecosystem, the larger predatory fish, such as groupers, increase in abundance and feed on the herbivores. With less herbivores, macroalgae expands and coral can no longer compete, shifting the ecosystem to one of algae dominance, affecting the survival of the reef system. Oceana released a report in July 2008, "Predators as Prey: Why Healthy Oceans Need Sharks", illustrating our need to protect sharks.

The research from August to October 2019 showed signal of positive correlations between the existences of Black Tip Shark at a healthy coral reef. As the shark can be worth more alive for shark diving tourism than dead in a fish market, the health of coral reef is also important. In the long term, this highlights the importance of coral reef health in Perhentian Island to enable the establishment of appropriate and effective reef sharks conservation.

1. Introduction

The **Blacktip Reef Shark** (*Carcharhinus melanopterus*) is a species of requiem shark, in the family Carcharhinidae, easily identified by the prominent black tips on its fins (especially on the first dorsal fin and its caudal fin). Among the most abundant sharks inhabiting the tropical coral reefs of the Indian and Pacific Oceans, this species prefers shallow, inshore waters. Its exposed first dorsal fin is a common sight in the region. The Black Tip reef shark is usually found over reef ledges and sandy flats, though it has also been known to enter brackish and freshwater environments. It typically attains a length of 1.6 m (5.2 ft). Human activity affects the on-going collapse of coral reef ecosystem which further domino effect to lesser the reef sharks population. Recent estimation suggested the shark population has declined regionally by 90% or more in 30 years. Coral reefs are used by variety of shark species as their unique habitat. Black Tip reef shark (*Carcharhinus melanopterus*) is known for its relatively high site fidelity by living in their coral reef's home range (up to 21 km²) for 12.61% to 84.57% of their life. Given this high residency of Black Tip reef sharks, the change in this predator population has caused trophic cascading effect in their coral reef's habitat.



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Tropical lagoons or coral reefs have ten components of food chain: macroalgae, planktons (zooplankton and phytoplankton), and coral reef at the base of food chain; omnivore (including corallivore), planktivore, and herbivore at the second level of trophic; piscivore and large carnivore at the trophic level three; mesocarnivore (reef sharks) at the trophic level four; and apex predator (pelagic sharks) at the top trophic level. One indicator of a healthy coral reef ecosystem is the abundance of herbivore fishes - as well as omnivore and planktivore , as this means the reduced population of macroalgae. The dynamic of the food chain in the coral reef ecosystem shows that the presence of reef sharks (mesopredator) may promote the abundance of herbivore, as this group are critical to the progress and outcome of coral recovery



Adult **Blacktip Reef Shark** (*Carcharhinus melanopterus*)

2. Methodology

Shark sightings were recorded at 14 different dive sites around Perhentian Island for three months between Augusts – October 2019 by dedicated professional scuba divers working at Sea Voice Divers dive center.

The shark sighting were only recorded if the shark swims within 15 meters range from the dive professional in order to eliminate the possibility of wrong species ID.

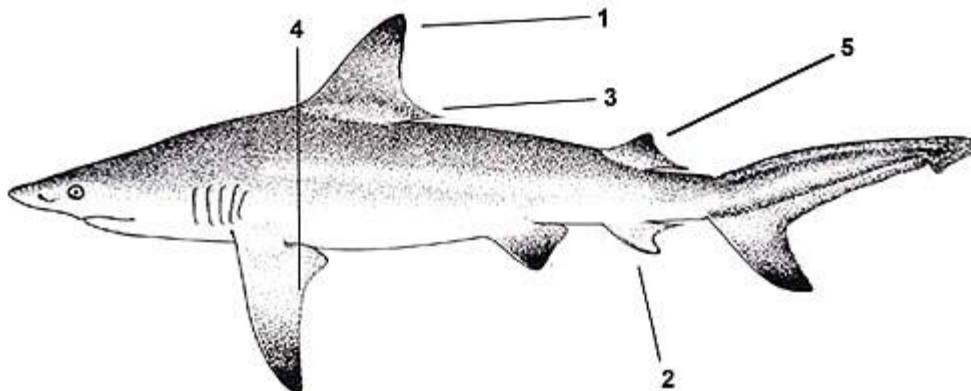
Both adult and juvenile Black Tip Reef Shark are recorded in the data.

Materials used for this research are the standard basic SCUBA diving gear, dive computer and underwater slate.



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How to ID Black Tip Shark

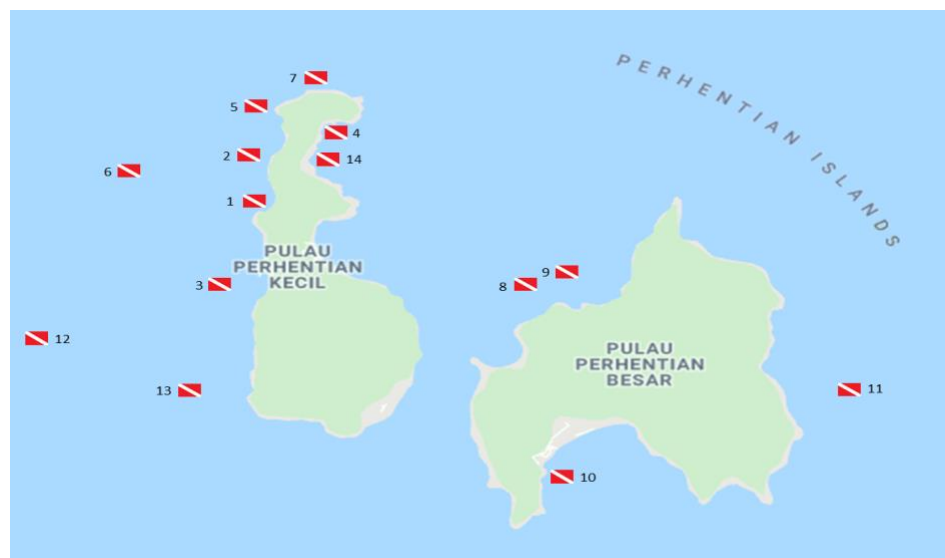


Anatomy of Black Tip shark (*Carcharhinus limbatus*).

1. First, second dorsal fins, pectoral fins, and lower lobe of caudal fin black-tipped (black markings may fade in adults; may be indistinct in juveniles)
2. Anal fin is unmarked
3. First dorsal fin has a short free rear tip
4. The first dorsal fin originates slightly over or behind insertion point of pectoral fins along inner margin
5. The second dorsal fin originates over or slightly in front of the anal fin origin

Dive Site Sampling:

1. Romantic Beach
2. San Choi Wreck
3. Seabell Reef
4. D'Lagoon
5. Panglima Abu
6. Temple
7. Kerma Darat
8. Batu Layar
9. Police Wreck
10. Shark Point
11. Terumbu Tiga
12. Sugar Wreck
13. Vietnamese Wreck





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14. Batu Nisan

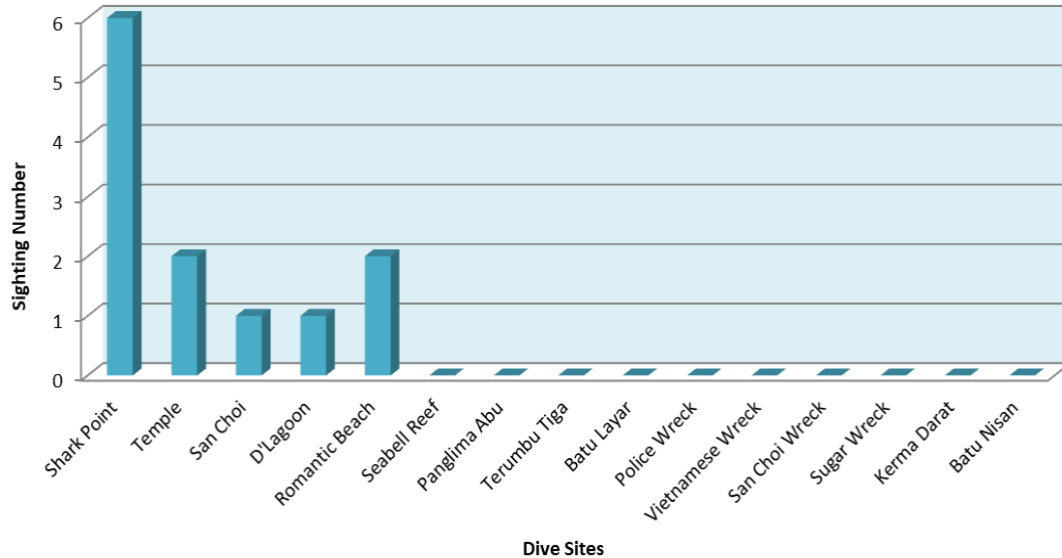
Data Recorded from August to October 2019

DATE	DIVE SITE	TIME	TEMPERATURE (°C)	DEPTH (meter)	TOTAL SHARK SEEN	SHARK SIZE
9.9.19	Shark Point	1330	30	1.5	3	Adult
15.9.19	Temple	0940	29	16.5	1	Adult
14.9.19	Shark Point	1235	29	10.1	2	Adult
28.9.19	Shark Point	1330	28	8.5	1	Adult
30.9.19	San Choi	0910	29	17	2	Adult
6.10.19	D'Lagoon	1240	29	7	1	Adult
7.10.19	Romantic Beach	1620	29	7	1	Adult
15.10.19	Temple	0940	28	16	1	Adult
14.10.19	Romantic Beach	1610	31	3	1	Adult
18.10.19	Shark Point	1600	30	9.5	1	Adult
19.10.19	Shark Point	1630	30	1	2	Adult
20.10.19	Shark Point	1705	30	5	1	Adult

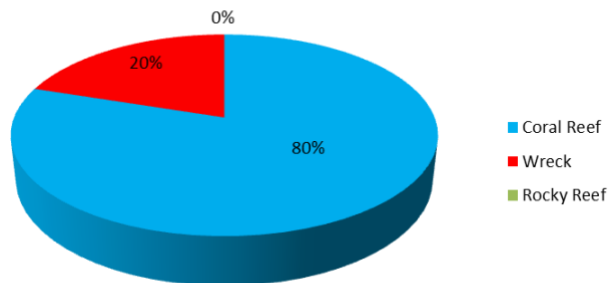


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Black Tip Shark Sighting in Perhentian Dive Sites Between Aug - Oct 2019



% Of Dive Site Topography VS Shark Sighting



Observation:

1. Shark Point dive site has the highest number of the shark sightings.
2. Four out of five dive sites that was spotted with shark are at coral reef topography (Shark Point, Temple, D'Lagoon, Romantic Beach), one dive site is at a ship wreck topography (San Choi) and no shark were spotted at any rocky reef sites.
3. There were no shark spotted in the whole month of August 2019 at any dive site.
4. Shark was sighted at normal Perhentian Island tropical water temperature ranging from 28-31 Degree C.
5. All shark sighted are adult size.



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Conclusion:

1. No solid conclusion can be made at this point of study as data are too limited in order to scrutinize the research.

Next:

1. To continue data collection for the season in 2020.
2. To measure the correlation between the existence of Black Tip shark with healthy coral reef.
3. To record the abundance of reef fishes using the Reef Check survey methodology.
4. To add diver operated video census in actual data.