

PAPER • OPEN ACCESS

Characteristics of turtle laying habitat on vemara beach, Banyuwangi Regency, East Java

To cite this article: W Isroni *et al* 2022 *IOP Conf. Ser.: Earth Environ. Sci.* **1036** 012087

View the [article online](#) for updates and enhancements.

You may also like

- [Beach erosion: Threat and adaptation measures of communities in the Tun Mustapha Park \(TMP\), Sabah, Malaysia](#)
E Saleh, G Jolis, N F Osman *et al.*
- [Area development based on conservation and ecotourism on the Cemara Beach \(Pine Trees Beach\), Pakis, Banyuwangi, East Java Province, Indonesia](#)
E W Setyaningrum, A T K Dewi, K P Prapti *et al.*
- [Long-term structural health monitoring strain modeling for bridges via data correlation and deep learning](#)
Chengbin Chen, Xuhao Huang, Zejia Liu *et al.*

Characteristics of turtle laying habitat on vemara beach, Banyuwangi Regency, East Java

W Isoni^{1,4}, N Maulida, M Irfan Muhajir³, P Surya Lesmana³, D Aji Ismail³

¹Department of Aquaculture, Faculty of Fisheries and Marine Science, Universitas Airlangga. Kampus C, Jl. Dharmahasada Permai No.330, Mulyorejo, Surabaya 60115, East Java

²Agriculture Industrial Technology, Faculty of Agricultural technology, Universitas Brawijaya, Jalan Veteran, Kecamatan Lowokwaru, Malang, Jawa Timur 651415

³Program Study Aquaculture, Faculty of Fisheries and Marine Science, Universitas Airlangga. Kampus C, Jl. Dharmahasada Permai No.330, Mulyorejo, Surabaya 60115, East Java

⁴Author correspondence: wahyu.isroni@fpk.unair.ac.id

Abstract. Turtles have a unique behavior, namely laying eggs on the same beach where they hatched. Turtles as protected animals continue to experience a decline in population caused by various factors including the degradation of nesting habitats. This study aims to determine the condition of the Cemara Beach habitat as a turtle nesting habitat. The research was conducted during September-November 2020 with a survey method by measuring the parameters of the Cemara Beach habitat which include sand temperature, air temperature, air humidity, beach width, beach slope, vegetation types and predators. The data collected was then analyzed descriptively qualitatively. The average air temperature is 28.07°C, the average sand temperature at a depth of 50 cm is 29.95°C, the average air humidity is 71.53%, the average beach width is 40 m and the average beach slope is 11.80 which shows the sloping beach category. The types of vegetation that grow along the coast are ketapang (*Terminalia catappa*), sea pine (*Casuarina equisetifolia*), horse tread (*Ipomoea pes-caprae*), cikumpai cikarao (*Lepturus repens*). As for the presence of predators identified during the observation, namely ghost crabs (*Ocypode cursor*).

1. Introduction

Turtles are a type of reptile whose existence is threatened, both from nature and human activities that endanger the population [1]. Currently the turtle population continues to decline, for example the number of leatherback turtles in the Pacific Ocean has decreased by about 95% over the last 20 years [2]. This decline in turtle populations is caused by various factors, both from nature such as climate change which causes a decrease in hatching eggs [3][4] and predation and human actions such as hunting and hunting. development. One way to conserve turtles is through the management of nesting sites because it is related to turtle life such as sex ratio, hatching success, and determining where the turtles return to lay their eggs [5]. Cemara Beach which is located in Pakis Village, Banyuwangi District, Banyuwangi, East Java is one of the beaches that is one of the landing sites for turtles to lay eggs on the island of Java. The purpose of this study was to determine the condition of the turtle nesting habitat on Cemara Beach, Banyuwangi Regency so that scientific information was obtained about the condition of the turtle nesting habitat on Cemara Beach, Banyuwangi Regency.



2. Method

The abiotic factors measured were air temperature, sand temperature, air humidity, beach width and beach slope. The biotic factors observed were the type of vegetation and the presence of predators.

2.1. Tools and materials

The equipment used in this research are thermometer, hygrometer, meter, GPS (*Global Positioning System*), camera, and wooden board.

3. Result and discussion

From the results of the identification, it is known that the type of turtle that landed and laid eggs in 2020 was the sea turtle (*Lepidochelys olivacea*). Thealso known as the gray turtle while in English theknown as the *olive ridley turtle isolive ridley turtle isolive ridley turtle*.

This turtle has a characteristic large head and has two pairs of *prefrontal scales* and three pairs of *postorbital scales*. The carapace is slightly widened with six or more pairs of *coastal scutes* and sometimes the number of *coastal scutes* on the left is different from that on the right. There are many turtles on the black sandy beaches of the island of Java.

Cemara Beach is a sandy beach with fine to medium sand grains and is brownish yellow to green. This shows that the type of sand on Cemara Beach is suitable as a turtle nesting habitat.

Turtle eggs found in natural nests at Cemara Beach were transferred to semi-natural nests. This is done as an effort to increase the success of hatchingeggs turtlebecause if the turtle eggs are left in the natural nest, it is feared that the nest will be damaged when the sea water is high or the nest is damaged due to predators and anticipate the theft of turtle eggs.

After the incubation period, turtle eggs can hatch successfully or fail to hatch. Eggs that successfully hatch will produce hatchlings or baby turtles. The stability of the incubation temperature affects the hatching rate where environmental factors around the nest also affect the fluctuation of incubation temperature [6]. Nest depth affects hatching success where nests with a depth of 50-75 cm are the best nest depths, while a depth of 30 cm gives low hatching success.

In addition to the depth of the nest, another factor that determines the success of hatching eggs is the size of the sand grains. The grain size of Cemara beach sand is in the fine category, with a diameter of 0.23 mm. The diameter of the fine sand grain size on the Cemarabaik beach as a turtle nesting habitat is supported by the opinion that fine sand grains will absorb and release heat more slowly so that it can stabilize the temperature and humidity of the hatchery [7].

From the observations made, it was found that the average abiotic environmental condition parameter values were as follows (Table 1)

Table 1. Average abiotic environmental condition parameter values

Station	Average
Air Temperature (°C)	28.07
Sand Temperature (°C)	29.95
Air Humidity (%)	71.53
Beach Width (m)	40
Coastal Slope (°)	11.8

Remarks: * : KEEPMENLH number 51 of 2004; ** :RNO

The surrounding land cover affects the hatching time and hatching rate of turtle eggs, where a shady land cover will provide a good hatching process. From the observations, it is known that there are 11 species of plants from 9 families that exist along the coast of the Cemara Coast line (Table 2).

Table 2. Types of Plants that Make up the Coastal Vegetation of Cemara Beach

Indonesian	Name Latin Name	Description
Ketapang	<i>Terminalia catappa</i>	Tree
Sea Fir	<i>Casuarina equisetifolia</i>	Tree
Horseshoe	<i>Ipomoea pes-caprae</i>	Herba
Cikumpai Cikarao	<i>Lepturus repens</i>	Herba

Turtles are animals that are vulnerable to predators such as wild boars, mongooses, forest dogs, eagles, sharks and monkeys. From the observations of the types of predators seen around the turtle nesting location, only ghost crabs (*Ocypode cursor*), but according to conservation managers sometimes monkeys, snakes and dogs are seen on Cemara Beach.

The beach where the turtle lays eggs has general requirements, including the beach is easy to reach from the sea, the position must be high enough to prevent the eggs from being submerged by the highest tide, the sand is relatively loose and of medium size to prevent the nest hole from collapsing in the sea. at the time of its formation. The selection of this location is the preferred nesting habitat for turtles with low salinity, humid conditions, and good substrate so that the turtle eggs are not flooded during the incubation period [8].

4. Conclusion

The abiotic environmental conditions at Cemara Beach are the average air temperature of 28.07°C, the average temperature of the sand at a depth of 50 cm is 29.95°C, the average air humidity is 71.53%, the average width of the beach 40 m and the average beach slope is 11.8° which indicates the sloping beach category. The types of vegetation that grow along the coast are ketapang (*Terminalia catappa*), sea pine (*Casuarina equisetifolia*), horse tread (*Ipomoea pes-caprae*), cikumpai cikarao (*Lepturus repens*). As for the presence of predators identified during the observation, namely ghost crabs (*Ocypode cursor*).

5. Reference

- [1] Darmawan, A., Nuitja, I. N. S., Soedharma, D., Halim, M. H., Kusri, M. D., Lubis, S. B., Alhanif, R., Khazali, M., Murdiah, M., Wahjuhardini, P. L., Setiabudiningsih, dan Mashar, A. (2009). Pedoman Teknis Pengelolaan Konservasi Penyu. Jakarta : Direktorat Konservasi dan Taman Nasional Laut, Direktorat Jenderal Kelautan Pesisir dan Pulau-pulau Kecil, Departemen Kelautan dan Perikanan RI.
- [2] Karnan. (2008). Penyu Hijau dan Konservasinya. Jurnal Pijar MIPA. 8 (1) : 39-46.
- [3] Zarnetske, P. L., Skelly, D. K., and Urban, M. C. (2012). Biotic Multipliers of Climate Change. Science AAAS. 336 : 1516-1518
- [4] Gomuttapong, S., In, W. K., Kitana, J., Pariyanonth, P., Thirakhupt, K., and Kitana, N. (2013). Green Turtle, *Chelonia mydas*, Nesting and Temperature Profile of the Nesting Beach at Huyong Island, the Similan Islands in Andaman Sea. Natural Resources. 4: 357-361.
- [5] Richayasa, A. (2015). Karakteristik Habitat Peneluran Penyu Sisik (*Eretmochelys imbricata*) di Pulau Geleang, Karimun Jawa. Skripsi. Jurusan Biologi MIPA Universitas Negeri Semarang.
- [6] Sheavtiyan, Setyawan, T. R., dan Lovadi, I. (2014). Tingkat Keberhasilan Penetasan Telur Penyu Hijau (*Chelonia mydas*, Linnaeus 1758) di Pantai Sebulu, Kabupaten Sambas. Jurnal Protobiont. 3 (1) : 46-54.
- [7] Putera, A. A. R., Sulmartiwi, L., dan Tjahjaningsih. (2015). Pengaruh Kedalaman Sarang Penetasan Penyu Hijau (*Chelonia mydas*) Terhadap Masa Inkubasi dan Persentase Keberhasilan Penetasan di Pantai Sukamade, Taman Nasional Meru Betiri, Banyuwangi Jawa Timur. Jurnal Ilmiah Perikanan dan Kelautan. 7(2) : 195-198.
- [8] Satriadi, A., Rudiana, E., dan Af-idati, N. (2003). Identifikasi Penyu dan Studi Karakteristik Fisik Habitat Identifikasi Penyu dan Studi Karakteristik Fisik Habitat Penelurannya di Pantai Samas, Kabupaten Bantul, Yogyakarta. Ilmu Kelautan. 8 (2) : 69-75.