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# PEKON MUARA TEMBULIH, NGAMBUR, PESISIR BARAT: PRELIMINARY STUDY ON THE CHARACTERISTICS OF TURTLE HABITAT

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## ABSTRACT

Regional marine conservation areas (KKLD) of the West Coast is an area of deployment and the nesting naturally. Ngambur the natural habitat of Olive Ridley turtles, green turtles, leatherback and hawksbill. Turtle habitat is located in the coastal area of vegetated and rescue area at the beach Ngambur, the turtle habitat environmental changes around the beach Ngambur thought to trigger the decline of turtle species. The purpose of this study is to determine the characteristics of the species diversity of turtles and turtle nesting habitat types in Muara Pekon Tembulih, Ngambur, West Coast. This research was conducted in February to May 2016 using a concentrated area and method of Rapid Assessment Procedures. Based on the research of sea turtle species found in Ngambur namely the green turtle (*Chelonia mydas*) (n = 3) and hawksbill (*Eretmochelys imbricata*) (n = 2) identification by outer shells were found. Characteristics of nesting habitat in Ngambur has a length of 941.23 meters beach, intertidal beach width ranging between 11.52 to 14.76 meters, the width of the beach supratidal ranged from 5.04 to 10.96 meters, temperature in the range of 26.5 to 33.750 C, the water content of 0.07%, the texture of the sand was 84.22% and 13.98% of fine sand texture, the flatness of the beach Ngambur including ramps category with an average of  $\pm 2.43\%$ . Vegetation is dominated nesting sites are the type of pandan sea (*Pandanus tectorius*) and animals that potentially predatory turtles and turtle eggs are paederinae (*Paederus littoralis*), ghost crabs (*Ocypode ceratophthalma*), eagle (*haliaetus leucogaster*), long-tailed macaque (*Macaca fascicularis*), snakes (*Bungarus Candidus*), dogs (*Canis lupus familiaris*) and lizard (*Varanus salvator*). The existence of turtles in Ngambur still be maintained, with good habitat conditions will help the survival of turtles in captivity turtle in Ngambur.

*Keywords: Turtle nesting habitat characteristics, Ngambur, Turtle.*

## 1. INTRODUCTION

Turtle is a species that lived on earth millions of years ago, and is able to perform the annual migration, in the thousands of kilometers between areas where to eat and a place to lay eggs. Turtle belongs to the class Reptilia were able to escape and live up to now.

Under the provisions of CITES (Convention on International Trade in Endangered Species of Wild Flora and Fauna), all kinds of sea turtles have been included in Appendix I, which means turtle international trade for commercial purposes is prohibited. World conservation body IUCN (International Union for Conservation of Nature and Natural Resources) insert hawksbill to the list of critical species (critically endangered). While the green turtle, olive ridley turtles and loggerhead sea turtles are classified into endangered species (endangered).

Region turtle conservation in Muara Pekon Tembulih Ngambur District of the West Coast District is a turtle nesting area as well as a turtle breeding area. The region includes KKLD (Marine Conservation Areas) whose activity since 2007 by community groups Sukamaju. Research the diversity and characteristics of sea turtle nesting habitat is done in Ngambur aims to obtain data and information on sea turtle nesting activity as well as the presence of habitats that may affect breeding success. Efforts to support sea turtle conservation in the region, it needs a good management system to collect data on the biological aspects, habitat and the factors that threaten the existence of sea turtles, so the policy of marine conservation areas in the region will be better Ngambur.

## 2. MATERIAL AND METHODS

The research was conducted from February to May 2016 Pekon Muara Tembulih, District Ngambur, West Coastal District, Lampung Province. Data is collected using a concentrated area, turtles are found in place to identify species based on morphological characteristics. The discovery of turtles taken point using GPS coordinates, and then note the condition of the existing vegetation around the site turtle invention. While the observations using Rapid Assessment Procedures method involves taking a point using GPS coordinates when there is the lowest and highest tides, the flatness of the beach, while collecting data about coastal vegetation and wildlife potential as natural predators of turtles done by direct observation in the study site.

Analysis of the nesting habitat characteristics is based on vegetation data and parameter data discovery environment turtles. Environmental parameters were analyzed descriptively, covers the length and width of the beach, beach vegetation type, texture and temperature of the sand beach, size of the hole, turtle predators and human activity.

## 3. RESULT AND DISCUSSION

### 3.1. Diversity Turtle

#### a. Turtle identification

Turtles were found on 22 April 2016 at 19:48 am at the observation station 1 is located at coordinates (x, y) (50 45 '73.97 "and a 1040 12' 03,61") is a type of green turtle (*Chelonia mydas*), this information tailored to the characteristics possessed. The characteristics possessed like the green turtle (*Chelonia mydas*), namely the shape of the plastron and a head that resembles a green turtle (Figure 1 and 2), forms a small head, beak blunt and this turtle can't enter his head into the shell (Agus 2007 ).

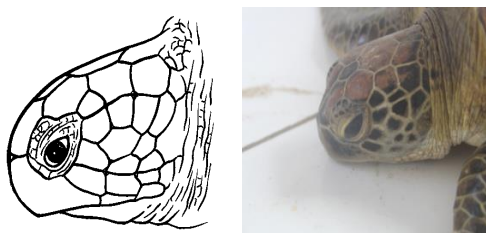


Figure 1. The shape of the head of a green turtle that was found in the observation station 1 Ngambur nesting beaches, (Wyneken, 2001).

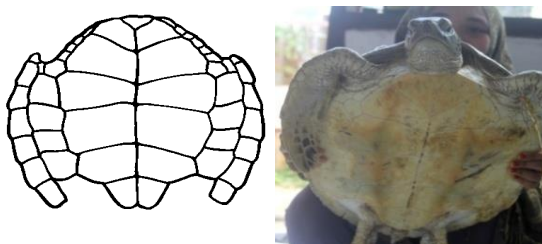


Figure 2. The shape of the plastron green turtles are found in the observation station 1 Ngambur nesting beaches, (Wyneken, 2001).

Direct encounter with the green turtle, when the implementation of a night patrol at 19:48 pm. Turtles are found weighs about 28.5 kg and 27 years old are conducting preparatory activities for the spawn. According to Agus (2007), the age of the turtle to reach sexual maturity ie if the turtle had lived for many years at sea, which is not less than 25 to 30 years. Before release turtle back to the sea, turtle morphology measurements (Table 1).

Table 1. The morphology of the green turtle (*Chelonia mydas*), which is found in the observation station 1 turtle nesting beaches in Ngambur on 22 April 2016

Date and Time encounter with wildlife	Morphology Green Turtle	Unit (cm)
22 April 2016	1. Curved carapace length	45,0
	2. carapace width	41,5
	3. Right upper limb length	25,0
	4. Left upper limb length	25,0
	5. The width of the right upper limb	12,5
	6. The width of the left upper limb	12,5
	7. The length of the lower leg right	12,0
	8. The length of the left lower leg	12,0
	9. The width of the right lower limb	7,0
	10. The width of the left lower leg	7,0
	11. Long neck - head	13,0
	12. The width of the head	6,6
	13. long tail	2,0
Total length		60 cm
Weight		28,5 kg

Before the turtle in release into the sea, after cleaning carapace of parasites that attack barnacles and moss that grows on the body (Figure 3).



Figure 3. Cleaning parasites (Barnacle) and the moss on the carapace.

Parasite that grows in the form of turtle shells of shellfish called barnacles. Barnacle has a white color with soft parts in it, which over time can erode the carapace so hollow. This type of parasite attacking the turtle's body such as the head and flipper turtles. Cleansing parasites and moss should be done with caution due to the barnacles of life converge on the turtle's body and if done abruptly, it can hurt the body of the turtle.

### 3.2. Physical Habitat Nesting

#### a. Length and Width Beach

Long beach turtle breeding Ngambur is 941.23 meters. Conditions beach long enough will facilitate in the selection of the mother turtle nesting sites. For the measurement of the width of the beach turtle breeding area is divided into two regions namely intertidal and sub supratidalnya (Table 2).

Long beach turtle breeding is 941.23 meters, while the width of the intertidal beach 11.52 m - 14.76 m wide beach supratidal 5.04 m - 10.96 m, it can help the turtle to land and lay eggs at the start the highest tide tide because the sea will bring the turtle to the limit of vegetation with ease. This

statement is consistent with the statement Hirth (1971), that a general state of green turtle nesting beaches is the beach with supratidal wide area.

Table 2. Measurement of the length and width of the beach nesting habitat Ngambur

No.	Observation Station	Long Beach	Wide Width Intertidal Beach	Wide Width Supratidal Beach
1.	Station 1	313.743 meter	11.52 meter	7.42 meter
2.	Station 2	313.743 meter	14.76 meter	10.96 meter
3.	Station 3	313.743 meter	12.68 meter	5.04 meter
Total		941.23 meter	27.28 ± 9.09	23.42 ± 7.80

### b. The size of the nest and laying

There is a relic hatchlings nest has hatched and found the size of the surface of the nest diameter is 42 cm, base diameter is 60 cm nests and nest depth was 68 cm (Figure 4).



Figure 4. Measurement nest of turtle eggs.

According to Agus (2007), green sea turtles lay eggs for approximately 2 hours with the number of eggs in a nest ranged between 80-195 grains. Nests are generally diameter between 23-45 cm with a depth of about 55-70 cm. The size of the nest to save turtle eggs depends on the species nesting turtle, turtle the size and number of eggs released by each species.

### c. Planting nest Turtle Eggs

Nest egg implantation is used to assist the process of hatching eggs, turtle eggs whose existence is threatened human theft or disturbed by predators can be exhumed and transferred to artificial nests safer. The size of the turtle nests plantings adapted to the type of turtle eggs, generally green turtle nests in diameter from 23 to 45 cm with a depth of 55 to 70 cm (Agus, 2007). Green turtle eggs that have been granted by the residents around the turtle breeding on 10 April 2016 amounted to 98 grains. Planting nest egg located at coordinates (x, y) (50 45 '87.01 "and a 1040 12' 56.88") in diameter nest observation station 1. measuring 30 cm by 57 cm depth (Figure 5).



Figure 5. The artificial nest planting of green turtle eggs in one observation station, the beach Ngambur nesting.

#### d. Vegetation Beaches

Found diverse coastal vegetation type, sea pandanus (*Pandanus tectorius*) is a plant that spreads overall on turtle nesting area in Ngambur. Type of beach vegetation at each observation station has a different composition (Table 3).

Table 3. The type of vegetation found on any observation station in Turtle Conservation Area in Ngambur

Observation Station	Vegetation Type	Scientific Name	Remarks
Observation Station 1	Tapak kuda	<i>Ipomea pescaprae</i>	Perdu
	Pandan laut	<i>Pandanus tectorius</i>	Perdu
	Ketapang	<i>Terminalia catappa</i>	Tree levels
	Kelapa	<i>Cocos nucifera</i>	Tree levels
Observation Station 2	Jati pasir	<i>Guettarda speciosa</i>	Tree levels
	Nyamplung	<i>Callophylum inophyllum</i>	Tree levels
	Tapak kuda	<i>Ipomea pescaprae</i>	Perdu
	Pandan laut	<i>Pandanus tectorius</i>	Perdu
	Ketapang	<i>Terminalia catappa</i>	Tree levels
Observation Station 3	Jati pasir	<i>Guettarda speciosa</i>	Tree levels
	Nyamplung	<i>Callophylum inophyllum</i>	Tree levels
	Tapak kuda	<i>Ipomea pescaprae</i>	Perdu
	Pandan laut	<i>Pandanus tectorius</i>	Perdu
	Waru laut	<i>Hibiscus tiliaceus</i>	Tree levels
	Ketapang	<i>Terminalia catappa</i>	Tree levels

#### e. Layout and Position Location Observation Station

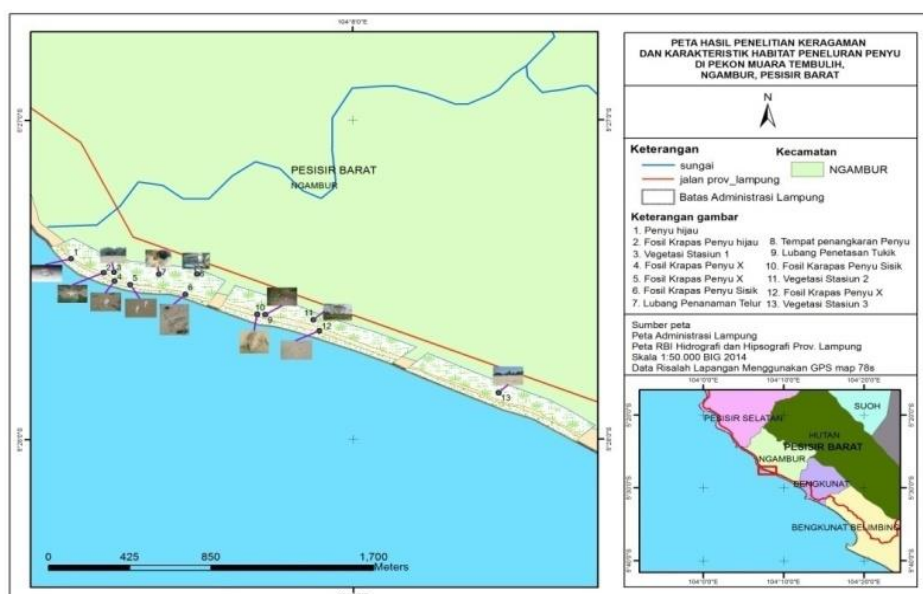


Figure 6. Lay out the location and position of observation stations in the region captivity Ngambur turtle (Bramsah, 2016).



Determination of coordinates at each point of observation stations use the GPS map 78s. The method used is the method of Rapid Assessment Procedures by tracing the beach and retrieve data in the form of point coordinates at the time of the encounter with turtles live and when they found signs of turtle like the discovery of shells, hawksbill turtle, trace and nest nesting, the tide sea in the intertidal and supratidal the coordinates vegetated areas and facilities in the turtle breeding locations (Figure 6).

Decision point coordinates using GPS map 78s, to produce information that could explain the location and position of the time found the turtle and the signs of its existence (Table 4).

Table 4. The location and the position is found turtles and signs of its presence in the nesting beaches Ngambur

No	Description	Latitude	Longitude	Observation Station
1	Green Turtle	-5,457397	104,120361	Station 1
2	Green turtle shells	-5,458147	104,121887	Station 1
3	Vegetation	-5,457924	104,122048	Station 1
4	Karapas not identified	-5,458419	104,121909	Station 1
5	Karapas not identified	-5,458608	104,123617	Station 1
6	Hawksbill turtle shells	-5,459265	104,125374	Station 1
7	Green Turtle Nest Egg Planting	-5,458701	104,125688	Station 1
8	Location Turtle Breeding Station In Ngambur	-5,45802	104,125959	Station 1
9	Hatchlings Hatching Hole	-5,460081	104,129269	Station 2
10	Hawksbill turtle shells	-5,460479	104,128606	Station 2
11	Vegetation	-5,461	104,131782	Station 2
12	Karapas not identified	-5,461002	104,131742	Station 2
13	Vegetation	-5,463782	104,13834	Station 3

## f. The Flatness Of The Beach

The flatness of the beach is measured by the distance between vegetation representing inland boundary to the shoreline as the ocean boundary. Measurement of the flatness of the beach in Ngambur done by measuring the height and distance of the beach flat (Table 5).

Table 5. Measurement of the flatness of the beach at three observation stations in Ngambur

Observation Station	Local Measurement Beach	Width Beach (m)	Difference Height (m)	Distance Flat (m)	$\alpha$	Tg $\alpha$	$\alpha$ ( $^{\circ}$ )	%
		07.00 wib	07.00 wib	07.00 wib				
Observation Station 1	Supratidal	7,42	0,28	7,39	0,037	6,45	2,11	3,79
	Intertidal	11,52	0,37	11,41	0,032	5,58	1,83	3,24
Observation Station 2	Supratidal	10,96	0,11	10,89	0,010	1,74	0,57	1,01
	Intertidal	14,76	0,64	14,68	0,043	7,50	2,46	4,35
Observation Station 3	Supratidal	5,04	0,10	5,01	0,019	3,31	1,08	0,01
	Intertidal	12,68	0,28	12,61	0,022	3,83	1,26	2,22
Average		62,38 $\pm 10,40$	1,78 $\pm 0,30$	61,99 $\pm 10,33$	0,163 $\pm 0,027$	28,41 $\pm 4,73$	9,31 $\pm 1,55$	14,62 $\pm 2,43$

The slope of the beach in Ngambur between 0.570 to 2.460. the slope of the highest in the observation station 2, namely in the area of intertidal 2,460 and the lowest was in the area supratidal 0.570. Nesting sites in the turtle breeding area Ngambur relatively flat and wide, and the area is quite spacious supratidalnya. According Nuitja (1992), in general, to the nesting area covers only ranges from 2-12 meters above the highest tide. While the flatness of the beach is relatively flat and flat, is a habitat for green turtles and hawksbill (Priyono, 2004).

### g. Temperature and Texture Sand Beach

Sand temperature measurement performed on intertidal areas and regions supratidal use a thermometer. Measurements done 3 times a day at (06:00, 12:00 and 21:00) in the intertidal area and supratidal that exist at each observation station. Temperature fluctuations in the beach sand is presented (Figure 7).

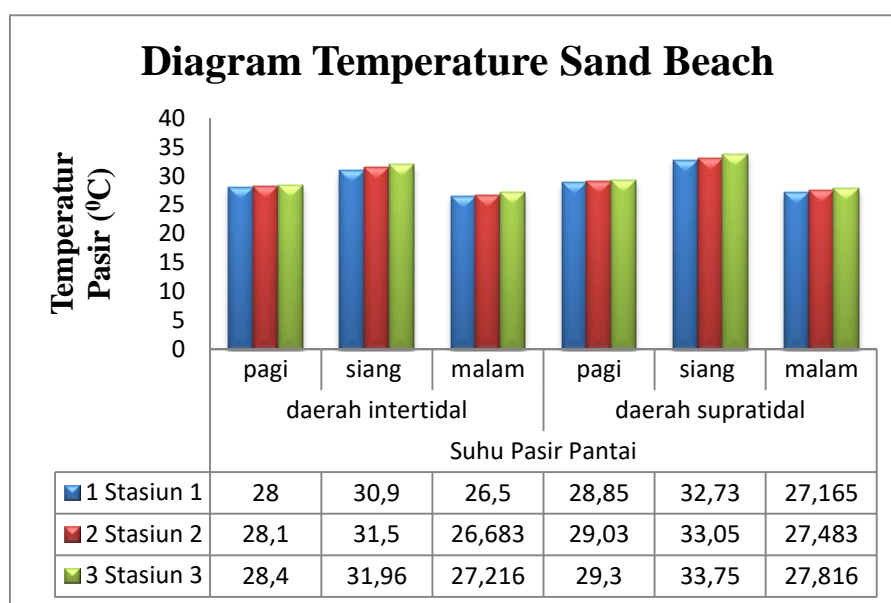


Figure 7. Fluctuations in temperature sand beach at 3 observation stations.

Increasing the maximum temperature occurs during the daytime ie 33.75 0C at station 3, the high temperature caused by the heat produced by the sun at 12:00 to 13:00 pm and a lack of vegetation cover in the vicinity of the station 3. The temperature at the surface of the sand is too high , can cause the level of turtle encounters at that location the less.

Testing of the texture and moisture content in the sand beach at Ngambur done using oven systems and methods of sieving (sieve) using the tools storey sand filter. Tests conducted at the Laboratory of Analysis Polinela, the water content is generated by the testing was 0.07%, the water content in the sand has a function which is to maintain the temperature in the sand, so that the temperature of the sand is relatively stable.

Texture sand nesting beaches in Ngambur dominated by sand texture moderate (mm 0:19 - 0:45 mm) amounted to 84.22% and the texture of fine sand (mm 0:09 - 0:19 mm) amounted to 13.98% (Table 6). Green and hawksbill turtles lay their eggs in the sand predominantly fine to medium sand. Nuitja (1992), states that the composition of the sand texture of sand to the nesting area of not less than 90% with a diameter between 0.18 to 0.21 mm and the remaining dust or clay with a grain diameter of fine form and medium.

### h. Type - Type Other Animals

Animals that potentially predatory turtles and turtle eggs in the turtle breeding area in Ngambur there are 7 species (Table 7).

Table 7. Type - Type Animals As Predator turtles and eggs

No.	Animal type	Latin Name	Description
1.	Ant Semai	<i>Paederus littoralis</i>	Predators
2.	Ghost Crab	<i>Ocypode ceratophthalma</i>	Predators
3.	Eagles	<i>Haliaetus leucogaster</i>	Predators
4.	Long-tailed monkeys	<i>Macaca fascicularis</i>	Predators
5.	Snake	<i>Bungarus candidus</i>	Predators
6.	Dog	<i>Canis lupus familiaris</i>	Predators
7.	Lizard	<i>Varanus salvator</i>	Predators

#### 4. CONCLUSION

Based on the research results can be summarized as follows.

1. Type of turtle found in the turtle breeding Ngambur is the green turtle (*Chelonia mydas*) (n=4) and hawksbill (*Eretmochelys imbricata*) (n=2).
2. Characteristics of nesting site for turtles in captivity turtle Ngambur has a length of 941.23 meters with a width shore intertidal beach 11.52 m - 14.76 m while the width of the beach supratidal 5.04 m - 10.96 m, sand temperatures in the range 26.5-33.75°C, the water content of 0.07%, the texture of the sand was 84.22% and 13.98% of fine sand texture, the flatness of the beach Ngambur including ramps category with an average of  $\pm 2.43\%$ . Vegetation is dominated nesting sites are the type of pandan sea (*Pandanus tectorius*) and animals that potentially predatory turtles and turtle eggs are paederinae (*Paederus littoralis*), ghost crabs (*Ocypode ceratophthalma*), eagle (*Haliaetus leucogaster*), long-tailed macaque (*Macaca fascicularis*), snakes (*Bungarus Candidus*), dogs (*Canis lupus familiaris*) and lizard (*Varanus salvator*).

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