



# DISTRIBUTION FREQUENCY OF NATURAL TURTLE NESTS BASED ON VEGETATION OF PANDANUS TECTORIUS EAST SEA- SON PERIOD ( JULY – SEPTEMBER) COASTAL COASTAL TURTLE TRANSFORMATION

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## KeyWords

GIS, Coastal Area, *Chelonia mydas*, Seaturtles, Spatial, Vegetation, Spawning .

## ABSTRACT

This research aims to find out the location of hotspots for turtles to lay eggs or not to lay eggs in the Pangumbahan coastal area, Sukabumi Regency. Observation carried out for 35 days starting from July 26 to September 1, 2021. The observation area is located in the Pangumbahan Coastal Area, Sukabumi Regency with observation points totaling to as many as 6 observation stations. The data taken is in the form of primary data which includes data on the location of turtle nests scattered along the coast and can be seen. The method used in this observation is descriptive qualitative through a survey approach. The survey approach is used because it is a way of working in an observation that uses a sample as a data collection tool. Based on the observations that have been made, it can be concluded that there are a total of 322 turtle nests during the period July – September 2021. The distribution of the coastline along the 2.3 KM points heatmap shows that the most distribution can be found in the Pos 2 area with 108 location points found. This is related to the presence of vegetation *Pandanus tectorius*, *Terminalia catappa* which is a spot for turtle nest habitat to carry out the spawning process.

## BACKGROUND

Turtle (Sea Turtle) is referred to as an ancient marine reptile species, living in tropical and subtropical areas. There are seven types of turtles in the world and six of them have Indonesian water habitats, namely green turtles (*Chelonia mydas*), Hawksbill turtles (*Eretmochelys imbricate*), tortoises (*Lepidochelys olivacea*), flat turtles (*Natator depressus*), loggerhead turtles (*Caretta caretta*), leatherback turtle (*Dermochelys coriacea*). While the kempsey turtle (*Lepidochelys kempseyi*) is only found in the waters of Florida and the Mexican sea. The green turtle (*Chelonia mydas*) belongs to the vertebrate class Reptilia. The green turtle is one of the turtles that has been included in the category of endangered species and is protected by Law Number 5 of 1990 concerning Conservation of Biological Natural Resources and Their Ecosystems.

Government Regulation (PP) Number 7 of 1999 concerning the Preservation of Plant and Animal Species and the IUCN World Conservation Agency (International Union for Conservation of Nature) includes this animal in the list of Appendix I of CITES (Convention on International Trade in Endangered Species of Wild Fauna and Flora) which has been ratified by the Government of Indonesia through Law Number 43 of 1974 as one of the turtle landing sites to lay eggs in Indonesia. Pangumbahan Village, Ciracap District, Sukabumi Regency is a village that has diverse resource potential, namely forestry, tourism, marine and fisheries, and agriculture (Efriyati and Zen, 2011).

The tourism potential of Pangumbahan which is well known from the past among the public, domestic tourists or foreign tourists is turtle tourism. Turtle tourism activities provided by the manager of the Pangumbahan Turtle Beach include screening of turtle films, releasing hatchlings, and watching turtle nesting activities. Turtles landing and laying eggs at the Pangumbahan Turtle Beach are dominated by green turtles. Egg laying activities are not only disturbed by human activities, coastal characteristics also affect turtle nesting. Based on the information above, it is necessary to conduct a direct study to determine the distribution of turtle nests on Pangumbahan Beach (Dermawan et al., 2009). This research aims to find out the location of hotspots for turtles to lay eggs or not to lay eggs in the Pangumbahan coastal area, Sukabumi Regency.

## METHOD

Observation carried out for 35 days starting from July 26 to September 1, 2021. The observation area is located in the Pangumbahan Coastal Area, Sukabumi Regency with observation points totaling to as many as 6 observation stations. The method used in this observation is descriptive qualitative through a survey approach. The survey approach is used because it is a way of working in an observation that uses a sample as a data collection tool (Sugiyono, 2012). The data taken is in the form of primary data which includes data on the location of turtle nests scattered along the coast and can be seen.

Data collection on the location of turtle nests was carried out for 35 days with data collection carried out at one time, namely in the morning. Then the data that has been obtained will be inputted into Google Earth Pro and processed using *Software* QGIS. Data collection on the location of turtle nests is carried out along the 2.3 KM Pangumbahan Coast which is spread out at Posts 1 to 6. This data collection is carried out when the nest conditions are still in a new state when the turtles land. The procedure for collecting data on the distribution of natural turtle nests is as follows:

Data on the distribution of turtle nests is taken with the following steps:

1. In the morning, coastal activities are carried out to observe the location points used as nests by turtles to lay eggs
2. The coastal walk is carried out along 2.3 KM with the area being explored is the Pangumbahan turtle coastal area
3. Once at the turtle nest location point, mark the point coordinates using *GPS coordinates*.
4. Record the longitude and latitude coordinates of the results on the worksheet.
5. After marking the coordinates. Input coordinate data on Google Earth to be visualized as a spatial vector
6. If the data is already in the form of vector data, process the coordinate data in QGIS 3.16 to be used as a *heatmap*.
7. Layouting the results of data processing, so that the resulting map is in the form of a *heatmap*

related to the distribution of turtle nests.

Data analysis was carried out based on the results of the number of turtle nest frequencies so that data processing was carried out through processing with Geographic Information System software with a qualitative descriptive approach. So that from the results of the distribution map, a descriptive description is carried out by the results obtained.

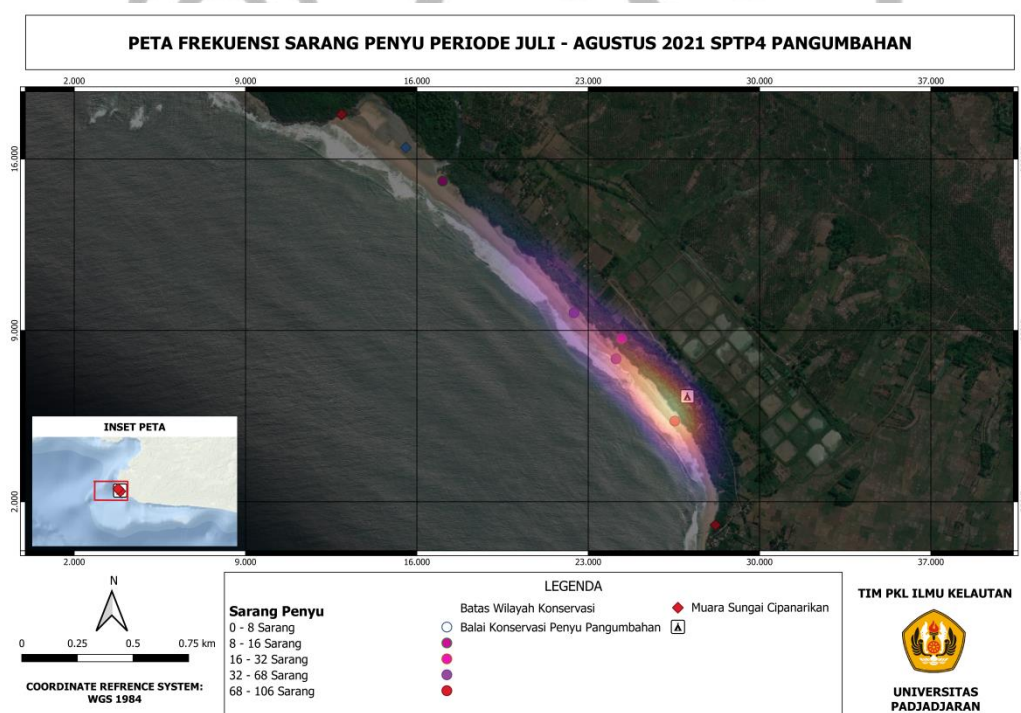
## RESULTS

### Turtle Nest Hotspot

In the visualization of the distribution map, it is explained using a heatmap as an indicator of the distribution of the most turtle nests in posts 1 – 6 of Pangumbahan Coastal Turtle Park. It can be seen that the distribution of turtle nests is centered on the area of post 2 with a potential of 68 – 106 nests Figure 2. At night the temperature outside the nest will have a lower temperature than inside the nest. The surface of the sand that is exposed to direct solar radiation causes the surface temperature to increase. This causes a conduction, namely the process of heat transfer from the surface of the sand (high temperature) to the sand at the bottom (low temperature), and vice versa. This is in accordance with the measurement data carried out, that at night the temperature outside is cooler than inside the nest.

It also affects the humidity but it's just that there is no very significant difference from the visible measurements. Pangumbahan beach is one of the places that fit the criteria of the area favored by turtles. As is well known, the Pangumbahan coastal area has a gently sloping sand beach covering an area of 2,300 m and an area of marine waters covering an area of 1,656 ha with seagrass beds and extensive coral areas. Generally, turtle habitat characteristics are sloping beaches with a slope of  $\pm 300$  with a wave height of 30 – 80 meters (Sasaerila et al., 2018).

In addition, Pangumbahan has 3 main areas consisting of forest / coastal vegetation areas, various seaweed fields and there are corals and corals on the seabed. The mangrove area is a characteristic feature of leatherback turtles, while the vegetation composition of pandanus(*tectoriusPandanus tectorius*), shrubs and sea hibiscus are characteristic features of the nesting habitat of green turtles and other turtle species. It is proven that in the Pangumbahan area, each nest found has a diversity of shrubs and the number of pandanus populations found in all parts of the Pangumbahan coastal area.



**Figure 1.** Frequency of nest turtle in SEM Period

## COASTAL CHARACTERISTICS

There is a variety of vegetation based on the location of the nests of turtle eggs, found as many as 12 species of vegetation in the form of trees, saplings, shrubs, and herbs. Each species found belongs to 12 families and 12 genera/genus. Based on the classification, there are 4 types of large trees, 3 types of small trees, 3 types of shrubs, 4 types of herbs, 1 type of shrubs. Pangumbahan coastal vegetation is currently filled with shrubs and shrubs in every area of coastal vegetation. Seen in the coastal area, the vegetation begins with the presence of a population of species *Ipoemoea pescaprae*, *Spinifex littoreus*, *Hibiscus tiliaceus*, *Pandanus tectorius*.

There are differences in vegetation structure between conservation post areas, but pandanus is the most common vegetation found in each area. In addition kiara jukutplants *Spinifexlittoreus* and *Pandanustectorius* herbaceous vegetationalso be very easily found from the area of post 1 to post 6. From Pangumbahan profile is already known that there are six areas where turtles lay eggs that each has an area of 400 m<sup>2</sup> with different structure. From the data analysis, it is known that on average each area has a sea breeze speed of 2.6 Knots (Sasaerila et al., 2018).

## Conclusion

Based on the observations that have been made, it can be concluded that there are a total of 322 turtle nests during the period July – September 2021. The distribution of the coastline along the 2.3 KMpoints heatmap shows that the most distribution can be found in the Pos 2 area with 108 location points found. . This is related to the presence ofvegetation *Pandanus tectorius*, *Terminalia catappa* which is a spot for turtle nest habitat to carry out the spawning process.

The composition of the pandanus thorn (*Pandanus tectorius*) vegetation, shrubs and sea hibiscus are characteristic features of the nesting habitat of green turtles and other turtle species. It is proven that in the Pangumbahan area, each nest found has a diversity of shrubs and the number of pandanus populations found in all parts of the Pangumbahan coastal area.

Another thing that can thwart the process of turtle nesting is the presence of human activities that are too distracting from the turtles, as well as the interaction between turtles in their nesting activities. Based on the number of nests that have been calculated, not all of the nests that have been made by turtles produce eggs, this is because there are turtles that lay eggs due to interference from human activities and interactions between turtles.

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