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Characteristics of the Labi-labi Habitat (Amyda cartilaginea) in the Tawun Ngawi Tourism Park

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Abstract

Labi-labi is a type of soft shell turtle that lives in fresh water. Labi-Labi is also a semi-aquatic animal that often spends its life in the waters. The population of turtles in the wild is widely used by the community for sale or consumption. Therefore, over time, people made conservation efforts to prevent the extinction of the turtles. One of the turtle conservation is the Tawun Ngawi Tourism Park. This tourist park is one of the conservation of the turtles and also the artificial habitat of the turtles. As a place for the conservation of turtles, of course the Tawun Tourism Park must be in accordance with the natural habitat of the turtles. The existence of this study aims to determine the characteristics and suitability level of the artificial habitat in the Tawun Tourism Park area. Then the method of conducting this research was carried out by direct observation by measuring the existing biotic and abiotic parameters and analyzed according to the suitability of their natural habitat. So that the result is that the artificial habitat in the Tawun Ngawi Tourism Park has characteristics that are in accordance with the natural habitat of the turtles. Then the hope for further research needs to be explored further regarding the habitat characteristics of the labi-labi in the wild.

Keywords: Habitat; Labi-labi; Tourist park

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INTRODUCTION

Labi-labi (Amyda cartilaginea) is a type of soft shell turtle, this turtle species lives in fresh water (Sentosa & Suryandari, 2014). Labi-labi (Amyda cartilaginea) or better known by the public as the turtledove is a species of the genus Amyda. Labi labi belongs to the Trionychidae family, which is widespread in the Southeast Asian region (Suhendar & Supartono, 2019). In Indonesia, turtles are scattered in several regions, including large island areas such as Sumatra, Java, Sulawesi and Kalimantan. According to previous research conducted by Susanti, (2013) the exact number of turtles in Indonesia is still unknown.

The distribution of turtles in Indonesia itself is used by the community for consumption or traded for export abroad. The activity of catching turtles for consumption has resulted in a decrease in the population of turtles. The declining population of turtles has restricted the catch and trade of turtles in Indonesia. This limitation is done in order to maintain the population size of the turtles. Apart from carrying out restrictions, a conservation was also made to maintain the population of turtles. Conservation of turtles in Indonesia is still very minimal because considering that turtles are not yet included in protected animals.

In general, the habitat of turtles in the wild is the main habitat of the turtles themselves, which are water areas. They live in several territorial waters of Indonesia. In general, labi-labi

live in water areas that have relatively calm flow characteristics, then also with slightly sandy or muddy water conditions. This type of muddy water is highly favored by labi-Labi because it can support reproductive activities and a place to hide. These types of waters can be found in swamp areas, dead lakes or rivers or lowlands. Then in general it can be found in terrestrial habitats which include secondary forest and primary forest starting from an altitude of about 200 m asl – 500 m asl. In addition, reptiles can also be found in aquatic habitats, which are areas where the waters are quite calm and slightly sandy (Bari et al., 2018). As is known, restrictions on hunting of turtles are being carried out in Indonesia, and conservation is also being carried out to maintain the turtle population. One of the turtle conservation which is also used as a means of tourism is the Tawun Ngawi Tourism Park.

Tawun Tourism Park in Ngawi is one of the famous tourist parks in East Java. Tawun Tourism Park or better known by the local community as the Tawun Baths is one of the tourism places that provides local cultural attractions. The local culture that exists in the Tawun Tourism Park is still closely held by the local community until now is the "Keduk Beji" tradition (Rohmah & Trilaksana, 2014). Besides being famous for this tradition, Tawun Tourism Park has various interesting facilities such as flower gardens, fish ponds, and the icon of the place is the turtle pond. The pond is an artificial pond containing hundreds of turtles. Apart from the labi-labi, the pond also contains several types of freshwater fish such as mujair. The pond is also used as a breeding place for turtles. The pond is used as a breeding ground to preserve the population of Labi-Labi in Ngawi.

Labyrinths in artificial habitats need an environment that matches their natural habitat in order to live and develop properly. According to Arbi et al (2021) in a previous study, knowing the characteristics of the turtle habitat was useful as a form of conservation of the turtles and also as a deterrent for over-exploitation of the turtles. Based on initial observations in the Tawun Tourism Park area in Ngawi, it was found that the pond is quite large. However, if you observe the condition of the pool surface, it is a little dirty and cloudy. Unsanitary conditions for turtle captivity occur due to several factors, one of which is the lack of awareness of the visitors about cleanliness and the lack of management of the turtle habitat. As a result, there is water pollution in the pond habitat. Based on *Peraturan Pemerintah Nomor 22 Tahun 2021 tentang Pedoman Perlindungan dan Pengelolaan Lingkungan Hidup*, Water pollutant is the entry or inclusion of living things, substances, energy, and/or other components into water by human activities so that they exceed the stipulated Water Quality Standards.

Therefore, considering that there is still little research that discusses the existence of turtles in that location and also the characteristics of their habitat. Researchers have an interest in conducting research at the Tawun Ngawi Tourism Park because they want to know the differences between artificial habitats and natural habitats for turtles. In addition, researchers are also interested in the characteristics of the habitat of the turtles in the Tawun Ngawi Tourism Park area. Then it is necessary to study the suitability of the habitat of the turtles in the Tawun Ngawi Tourism Park area. This study aims to determine the characteristics and suitability level of the artificial habitat in the Tawun Tourism Park area.

METHOD

This research was conducted at the Tawun Ngawi Tourism Park, Dari, Jl. Sunan Lawu, Dari, Tawun, Kasreman, Ngawi Regency, East Java. This research began with making observations at the Tawun Ngawi Tourism Park on July 17-30 2022. The type of research used was quantitative descriptive research which aimed to analyze the characteristics of the pond as an artificial habitat for turtles. In addition, this study also aims to obtain data and identify the level of habitat suitability in the Tawun Ngawi Tourism Park. This study also aims to analyze the effect of abiotic factors, namely water pH, water temperature, pond depth, brightness, on the level of suitability of turtle habitat in Tawun Ngawi Tourism Park. In

addition to abiotic factors, researchers also analyzed biotic factors such as the type of food and the presence of turtles.

The population and samples of this study are biotic and abiotic factors in the pond as a habitat for artificial turtles in the Tawun Ngawi Tourism Park. Then for data collection techniques carried out by simple random sampling technique. The sampling technique was used in the hope of knowing the characteristics of the ponds in the Tawun Ngawi Tourism Park. The variables of this study are the biotic and abiotic factors present in the pond at Tawun Tourism Park. These biotic and abiotic factors include water pH, water temperature, water clarity, type of feed for the turtles, and other species of pond inhabitants.

As for this research activity, several tools are needed during the research. Table 1 below presents the tools used during the research activities.

Table 1. Tools used in research

No	Tools	Function	Amout
1.	Stationary	Record research results	1
2.	Thermometer	To measure water temperature	1
3.	pH Meter	To measure the pH of water	1
4.	meter tool	To measure the depth of the pond	1
5.	*Secchi disk*	To measure the brightness level of the pond	1
6.	Camera	For documentation of results	1
7.	DO Test	To measure dissolved oxygen levels	1

In addition to tools in research activities, materials are also needed to assist the process of research activities. Table 2 below presents the materials used during the research activities.

Table 2. Materials used

No	Tools	Function	Amout
1.	Reagen DO Test	To measure dissolved oxygen levels	1 set

This research activity was carried out by means of direct observation at the research location. The data taken is in the form of abiotic and biotic factors. The biotic and abiotic factors are in the form of Physical-Chemical and Biological parameters such as Temperature, pH, Pond Depth, Dissolved Oxygen Content, availability of feed and presence of turtles. Parameter measurements of temperature, pH, pond depth, and dissolved oxygen content were repeated 7 times at 3 location posts.

The analysis technique used is to use habitat suitability level analysis. As for being analyzed are some of the physico-chemical and biological parameters that have been measured. The observed parameters are characteristic data of artificial habitats in the Tawun Tourism Park. Physico-chemical component data are presented in tabulation form and analyzed in a quantitative descriptive manner. Then the biotic components are analyzed based on the important value index (IVI), such as the availability of feed and other species found in the pond. Furthermore, calculations were carried out for each habitat parameter similar to Ribai et al., (2015) in their research on the level of habitat suitability. In addition, a normality calculation of the data obtained was also carried out to see whether the distribution of the data was normal or not.

The following provides Table 3 regarding the parameters and criteria for the data analyzed.

Table 3. Habitat characteristic parameter criteria

Parameter	criteria	Value Limit	Source
Water pH	7-8	3	(Imanulloh, 2010)
	4-6	2	
	<4	1	

Parameter	criteria	Value Limit	Source
Water Temperature	22-32^0	3	(Suhendar & Supartono, 2019)
	32-35^0	2	
	>35^0	1	
Dissolved oxygen content	4,5-7mg/L	3	(Arifin, 2016)
	2-4 mg/L	2	
	> 7 mg/L	1	
Water brightness	20-40 cm	3	(Dimenta et al., 2020)
	40-50 cm	2	
	>50 cm	1	
Pool Depth	300 cm	3	(Diana et al., 2018)
	350-400 cm	2	
	>500 cm	1	
Availability of Feed	There is sufficient feed	3	(Muryanto & Sukamto, 2016)
	Feed a little	2	
	No feed available	1	
The presence of turtles	Found more than 5	3	(Sentosa & Suryandari, 2014)
	Found the turtles	2	
	No turtles found	1	

Second habitat suitability score (artificial) = $\frac{\Sigma scores\ across\ research\ blocks}{\Sigma Parameter} X100\%$

Information : skor 30 : very suitable
skor 20-29 : suitable
skor 10-19 : inappropriate or low

Source : (Ribai et al., 2015)

RESULTS AND DISCUSSION

The research was conducted in the Tawun Ngawi Tourism Park Area, Ngawi Regency, which was carried out from August to September 2022. The research results obtained included data on abiotic and biotic factors, namely temperature, water pH, brightness, depth, DO, availability of feed and presence of turtles

Based on research on the measurement of abiotic factors which include temperature, water pH, water brightness, pond depth, DO. Measurement of abiotic factors was measured at 3 places for 7 days.

pH measurement

Based on the research results of measuring abiotic pH factors in the Tawun Tourism Park, Ngawi Regency, it can be seen in Table 4.

Table 4. Water pH levels in the Tawun Ngawi Tourism Park area

Location / Day	1	2	3	4	5	6	7	Average	Source	Conformity Level
I	8	7.6	8	7.7	7.8	7.9	8	7.8	(Imanulloh, 2010)	3
II	7.8	8	8	7.7	7.7	7.9	7.9	7.8		3
III	8	7.9	8	7.7	7.8	7.8	7.9	7.8		3

Based on Table 4.1 it is known that the pH in the Tawun Ngawi Tourism Park Area has an average of 7.8 in location 1, 7.8 in location 2, and 7.8 in location 3. The research results show that if the pH in the ponds in the Tawun Tourism Park Area is classified as normal or ranged from 7-8. According to Siegers, (2019) the pH that can be tolerated by aquatic fauna is a minimum of pH 4 and a maximum of pH 11. Acidity (pH) that does not comply with the minimum and maximum limits will cause stress to animals, be susceptible to disease, and experience low productivity and growth.

Temperature measurement

The results of temperature measurements in the Tawun Ngawi Tourism Park area based on research can be seen in Table 5.

Table 5. Water temperature in the Tawun Ngawi Tourism Park area

Location / Day	1	2	3	4	5	6	7	Average	Source	Conformity Level
I	28	30	30	31	31	30	30	30	(Suhendar & Supartono, 2019)	3
II	28	28	28	29	29	28	28	28.28		3
III	29	28	31	28	29	28	28	28.71		3

Based on Table 5. it is known that the water temperature in the Tawun Ngawi Tourism Park Area has an average water temperature at location 1 around 30°, at location 2 around 28.28°, and at location 3 around 28.71°. Based on these results it can be seen if the temperature corresponds to the original environmental temperature of the turtles. Labi-labi in natural habitats such as swamps or even artificial habitats such as ponds or captivity can live in water temperatures around 25^0-30^0C.

Water brightness measurement

The results of measuring the brightness of the water in the Tawun Ngawi Tourism Park area can be seen in Table 6.

Table 6. The brightness of the water in the Tawun Ngawi Tourism Park area

Location / Day	1	2	3	4	5	6	7	Average	Source	Conformity Level
I	30	29	31	30	31	30	30	30,14	(Dimenta et al., 2020)	3
II	40	40	39	41	40	40	39	39,85		3
III	35	36	35	35	37	34	35	35,28		3

Based on Table 6, it is known that the results of measuring the water brightness in the Tawun Ngawi Tourism Park area have an average water brightness level in location 1 of about 30.14cm, in location 2 of around 39.85cm, and in location 3 of around 35.28cm. The brightness level in the Tawun Tourism Park area is appropriate. At that level the turtles can still see the condition of the waters of the area. So when the visitors are feeding the turtles they still know the whereabouts of the food.

Water DO measurement

Based on the research that has been carried out, the results of measuring DO of water in the Tawun Tourism Park area can be seen in Table 7.

Table 7. DO water in the Tawun Ngawi Tourism Park area

Location / Day	1	2	3	4	5	6	7	Average	Source	Conformity Level
I	3	4	5	4	5	4	5	4,28	(Arifin, 2016)	2
II	4	6	5	6	5	5	4	5		3
III	2	3	2	2	3	3	4	2,71		2

Based on measurements from DO in the Tawun Ngawi Tourism Park area, the average yield was obtained at location 1 around 4.71, at location 2 around 4.42, and at location 3 around 4.28. Seeing these results the dissolved oxygen content in the pond is quite appropriate. The difference in dissolved oxygen content at locations I, II and III is influenced by various factors. According to Azizah, (2017) dissolved oxygen is a limiting factor for the aquatic environment and can be used as an indication of the presence of organic matter pollution. The higher the content of organic matter in the waters, the more dissolved oxygen there is in the water.

Water depth measurement

Based on the research activities that have been carried out on the depth of the water along with the results of measuring the water depth can be seen in Table 8.

Table 8. The depth of the pond in the Tawun Ngawi Tourism Park Area

Location / Day	1	2	3	4	5	6	7	Average	Source	Conformity Level
I	300 cm	300 cm	300 cm	300 cm	300 cm	300 cm	300 cm	300 cm	(Diana et al., 2018)	3
II	350 cm	350 cm	350 cm	350 cm	350 cm	350 cm	350 cm	350 cm		3
III	400 cm	400 cm	400 cm	400 cm	400 cm	400 cm	400 cm	400 cm		3

Based on measurements into the pond in the Tawun Tourism Park area, the average results were obtained at location 1 of about 300 cm, location 2 of about 350 cm, and location 3 of about 400 cm. The depth of the turtle habitat affects the process of the turtles in carrying out their activities in water. Habitat depth has a close relationship with the ecological needs of the turtles themselves. One of them is when the turtles reproduce. The depth of the turtle habitat has an effect on when the turtles will build a nest to lay their eggs. Depth has an effect because the deeper a water is, the temperature conditions for the incubation holes of turtle eggs also affect. The depth of the water also affects the level of brightness of the water where if the deeper the conditions of the waters, the less sunlight that enters the waters so that the water temperature will drop (Arbi et al., 2021).

Then, apart from measuring abiotic factors, this study also measured biological factors. The biological factors observed were the availability of feed and also the presence of turtles. Based on research on the measurement of biotic factors which include the availability of feed in the Tawun Ngawi Tourism Park area, it is carried out by random observation. Biotic factor measurements were carried out for 7 days in 3 different locations. The biotic factor observed was the availability of feed in the Tawun Ngawi Tourism Park area. In the Tawun Ngawi Tourism Park, the turtles receive food from visitors in the form of fish feed that has been provided by the officers. Apart from the fish feed that has been provided, the spiders also receive food from the local regional service officers.

As is known, food is one of the basic needs of living things. So that observation of the availability of feed for the turtles is needed to find out whether the habitat occupied by the turtles themselves is suitable or not. Knowing the eating habits of the turtles aims to find out what food is suitable for the turtles to consume. Food itself is a factor that determines the population size, growth and condition of the turtles (Muryanto & Balai, 2016)

Based on this description, the results of observations for 7 days related to the availability of feed for turtles in the Tawun Ngawi Tourism Park area are presented below. The following results of observations of visitor activity at the Tawun Ngawi Tourism Park can be seen in Table 9.

Table 9. The presence of visitors who come and provide food

Location	Visitors who come and feed	Source	Conformity Level
I	Visitors just pass through the location	(Ningsih et al., 2015)	1
II	Many visitors stop to feed		3
III	There are no visitors passing through that location		1

Based on Table 9, it can be seen that most visitor activities are in post II to provide feed to the turtles. Then at post I, visitors just pass by and don't feed the turtles. Whereas at location III there were no visitors who passed through that location because the location was quite far from other tourist rides.

In addition to the availability of feed, the presence of turtles is also included in the

observed biotic factors. Therefore, observations were made for 7 days to observe the presence of turtles in the pond area of the Tawun Ngawi Tourism Park. The following results of observations of the presence of turtles in the pond area of the Tawun Ngawi Tourism Park can be seen in Table 10.

Table 10. The existence of turtles in the Tawun Ngawi Tourism Park Area

Location	The existence of the turtles	Source	Conformity Level
I	Only 1-3 adults and a few fish appear		1
II	More than 5 turtles of various ages and dozens of fish appeared	(Sentosa & Suryandari, 2014)	3
III	No turtles found		1

In the Tawun Tourism Park pond area, a number of turtles and fish were found. At Post 1 found more than 5 fish and also 3 adult turtles. Then at post 2 found about more than 5 fish and more than 5 turtles. At post 3 no turtles were found at all. Seeing this, it is possible that the spiders will appear when they are approaching a food source. This possibility occurred because post 1 and 2 were areas that were crowded with visitors, so because of this, the spiders appeared. It's different from post 3 which is quite quiet from visitors so the turtles don't show themselves. Based on this, it can be seen that the population of the turtles themselves is quite large in the area. In addition, according to an interview with the caretaker of the place, there are more than 350 turtles in the Pond of the Tawun Tourism Park.

Based on the results of measurements of biotic and abiotic parameters in the Tawun Tourism Park pond area, the following results are obtained for measuring the level of habitat suitability. The following results of measuring the level of habitat suitability for biotic and abiotic parameters can be seen in Table 11.

Table 11. Habitat Suitability Level

Parameter	Location/Score						References
	I	S	II	S	III	S	
pH	7,8	3	7,8	3	7,8	3	(Imanulloh, 2010)
Temperature	30	3	28,28	3	28,71	3	(Suhendar & Supartono, 2019)
DO	4,28	2	5	3	2,71	2	(Arifin, 2016)
KC	30,14	3	39,8	3	35,28	3	(Suhendar & Supartono, 2019)
KD	300	3	350	3	400	3	(Diana et al., 2018)
PK	3	2	>3	2	<3	1	(Muryanto & Sukamto, 2016)
LB	3	1	10	3	0	1	(Sentosa & Suryandari, 2014)
Score		17		20		16	

After observing these aspects, the results obtained were that the pH at each location had a suitability score of 3 with an acidity level ranging from 7-8. The temperature at each location has a suitability score of 3 with temperatures ranging from 28o-35o C. DO in that area has a suitability score of 2 at location I, a score of 3 at location II, and a score of 2 at location III. Then the brightness level at each location has a suitability score of 3 at locations I, II and III with brightness levels ranging from 30-40 cm. The depth in the Tawun Tourism Park area has a suitability score of 3 at locations I, II, and III with depths ranging from 300-400 cm.

In addition to the abiotic aspects, there are biotic aspects that affect the level of habitat suitability. As for the biotic aspect, there are 2 parameters observed, namely, the availability of feed and the presence of turtles. On the parameter of feed availability after observation, a score of 2 was obtained at location I, a score of 2 at location II and a score of 1 at location III. Then besides the availability of feed there is also the presence of turtles which also includes biotic parameters. The presence of turtles has a suitability score of 1 at location I, a score of 3 at location II, and a score of 1 at location III.

Based on these results, a total score of 17 was obtained at location I, a score of 20 at location II, and a score of 16 at location III. Then at location I it has a total score of 17 meaning it has a suitability level of around 86.6%. Location II has a total score of 20 which means it has a suitability level of around 96.6%. Location III has a total score of 16 which means it has a suitability level of around 83.3%. Based on these calculations, it can be seen that location II has the highest level of conformity compared to other locations.

Even though the conditions of habitat suitability at each location are not 100% suitable, the pond area is already classified as a habitat that is quite suitable for habitats in the wild. An artificial habitat that matches the existing parameters in the wild habitat will make the turtles comfortable to live in the area.

CONCLUSION

The habitat characteristics of the turtles in the Tawun Ngawi Tourism Park area have the characteristics of a pond with a depth of 2-3 m, with a brightness level of 30-40. In addition, the condition of the pond has a normal level of acidity (pH), namely 7-8 and with an average water DO of 5-3 mg/l. Then during the study the temperature of the pond ranged from 28-34o C. Then after measuring the level of suitability of the habitat in the Tawun Ngawi Tourism Park pond area, it can be concluded that the habitat is quite suitable for the natural habitat of the turtles.

RECOMMENDATION

Given the limitations in the research that has been done, it is necessary to provide suggestions that can be used as a reference for previous research, namely (1) it is hoped that in future studies the characteristics of artificial habitats in the Tawun Ngawi Tourism Park area are expected to be based on biotic and abiotic parameters; (2) This research can be used as a reference either in material or in other research related to artificial turtle habitats (*Amyda cartilaginea*).

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