

Conservation Status of Black Soft Shell Turtle (*Nilssonina nigricans*) in Bangladesh

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Abstract

Black Soft Shell turtle (*Nilssonina nigricans*) is a freshwater endangered species in Bangladesh. They are now extinct from nature and a limited number of species are found in a pond of Bayazid Bostami Mazar at Chittagong. This turtle is a sacred symbol to the people. Thus, considering spiritual beliefs and their ecological importance, it has become necessary to reintroduce them in nature. Although Wildlife and Nature Conservation Division (WNCD), Chittagong has been helping Mazar committee since 2002, it is not still enough. So this study was undertaken to explore the present conservational status of this species. The study identified 467 turtles in Mazar and revealed that the breeding ground was quite good because of having the appropriate moisture content, soil pH and soil type for breeding of Black Soft Shell turtle. Another positive result found that these turtles were laying eggs naturally in last few years. However, the success ratio of hatching was very few and some died after hatching. Lack of adequate knowledge about management, Mazar committee failed to prevent mortality rate and reintroduce them in nature. Proper training and management guidelines of Mazar personnel will help to increase their survival rate and back them in their wild state in near future.

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1. Introduction

Black Soft Shell turtles (*Nilssonina nigricans*) are chelonian aquatic species which was once abundant in Asia, Africa and New Guinea (Fritz and Havas, 2007). But recently, it has been declared extinct in the wild where habitat encroachment and water pollution were dominant cause for this (IUCN, 2002). Fortunately, it is survived in few spots in the Brahmaputra River drainage in the state of Assam and some of the temple ponds of Bangladesh and India (Meylan, 1987). In Bangladesh, this critically endangered species live only in the pond of Hazrat Bayazid Bostami shrine in Chittagong city (Groombridge, 1982; Ahsan *et al.*, 1991; Hilton-Taylor, 2000). Nevertheless, this habitat doesn't get extra attention to the conservation experts instead of getting poisoned which is really needed today. There is a strong belief that the turtles are descendants of the evil spirits whose ancestors, having incurred the wrath of the great saint, were transformed into turtles (Ahsan and Saeed, 2009). Thus, shrine community never releases any of the turtles to outside for any purpose. Yet, the conditions should be changed and improved in order to ensure the health and well-being of the turtles. Since 2013, Turtle Survival

Alliance (TSA) in India has worked diligently to improve conditions at selected temple ponds in Assam where these turtles were discovered. But very few researches have been done for the conservation of these turtles in Bangladesh. These turtles need to be conserved for their ecological importance and bearing their existence to future. Otherwise, the species will totally be extinct from the world. Because of the spiritual beliefs regarding these turtles, the committee members do not let any researchers to do their research. They believe that these turtles are holy spirits. So they should not be introduced to nature. This ideology should be changed in order to save this species. Consequently, this study objective is to investigate the habitat status of *Nilssonina nigricans* in Bangladesh.

2. Materials and Methods

2.1 Study Site

The study was carried out at the Bayazid Bostami Shrine, Chittagong. It is the only place in Bangladesh where around 450 turtles of different ages are found. The shrine is located between 22°23'20"N to 91°48'36"E. The shrine consists of an old mosque

and a large pond. The pond is approximately 5800 square meters in size and about 9-10 meter in depth. Basically, three month in a year is winter, while the temperature falls down to 10 to 14 degree Celsius. Yet, the average temperature in the hottest months is 32°C and average rainfall is about 740.8 mm. The relative humidity ranges from 5% in February to 88.5% in July (Weather office, Chittagong).

2.2 Management of Black Soft Shell Turtle

The Mazar committee consisting of 31 Khadem which is in charge of the management of the turtles. They look after the turtles and maintain the pond and the breeding ground. Fishing is prohibited in the pond. So the pond is well stocked. Some fishes i.e. carps, salmons are present in a lot of numbers in the pond. No houses are allowed near the Mazar area and a high security is arranged for the pond. In 2006, the pond was poisoned by unknown poachers. The Mazar committee was able to move all the turtles to a safe place. When the water was confirmed to have enough oxygen and is not poisonous anymore by the specialists of WNCDC, the turtles were brought back to the pond and security was also increased from then.

2.3 Study Design and Procedure

A total number of 257 Black Soft Shell Turtle were purposively sampled and caught randomly with the respective factors shell color (black, brownish black, greenish brown), being sex (male, female) (Table 1). The turtles can be differentiated by the color of their shell. The difference age turtles have different shell colors. They are categorized into three age classes according to their shell color. Most of the daytime the turtles stay under water. So in most instances, population estimates were assessed from confirmed, reliable reports and few cases the estimates were assessed by direct evidence. Each turtle was tested only once. The sampled area was measured and soil moisture data were collected two times each during the test period: morning (9.00 am-11.00 am), afternoon (3.00 pm-5.00 pm). These two times period was chosen purposively for the convenience of collecting feeding data since visitors mostly visit to the Mazar on these two times and provide food to the turtles.

Table 1: Age classes according to the shell color

Black	Adult
Brownish black	Sub-adults
Greenish brown	Juveniles

2.4 Data Collection

Geographical location was tracked by the GPS. The thermometer was used to measure soil

temperature. The study area and pond size were calculated by measuring tape. Moisture content and P^H meter data were carefully gathered when measuring breeding ground moisture content and P^H. Data were collected on temperature variation, habitat and food and feeding habit, breeding facilities and other status related to these turtles conservation. Breeding facilities were justified by asking the person in charge from the WNCDC named Mohammad Ali. Other information was taken from the Mazar committee office and WNCDC. Habitat area of the turtles was calculated by the following formula;

$$\text{habitat area per turtle} = \frac{\text{total area}}{\text{total number of turtles}}$$

2.5 Data Analysis

Data and results presented in this paper are gleaned from literature, studies, and fieldwork carried out during extensive surveys conducted in the study site. Calculations of the breeding data were analyzed by Microsoft Office Excel. Based on fieldwork, a SWOT analysis was performed in the study shrine to determine their role, strengths, and opportunities to serve as a refuge for this threatened wildlife.

3. Results and Discussion

In 2006, some unknown poachers poisoned the pond water in order to kill the turtles. At that time Khadems along with the help of WNCDC managed to save the turtles by moving them from the pond. All the fishes died at that time because of poison. Later the experts managed to change the water from the pond and it took about two months to refresh the water. When the experts confirmed that the oxygen level in the water was suitable for the turtles then the turtles were brought back. Now the management committee is working together with the WNCDC for the conservation of these turtles. These turtles must be conserved as they are the last remaining individuals in the earth.

3.1 Number of Turtles

According to the senior Khadem, the number was last counted in 2006 when the pond was poisoned. After that, they have never been counted. But from the last six years counting of hatchlings, it seems that the number is increasing every year. Though the turtles lay about 400-450 eggs per year only a few eggs hatch among them.

The (Table 2) shows that the number of eggs hatched is increasing every year. Though the data of 2012 and 2013 could not be found, the amount of 2014 shows the gradual increase of the hatchlings. From the table, it is sure that the number of turtles should be about 700-750. But according to WNCDC, the number is

around 500. A research study of SA Mukul *et al.* (2012) shows that in 2012 the number of turtles was around 400. But in my study, the number increased to around 500. It is a good sign that the number is increasing.

Table 2: Soil type, moisture content, and pH of breeding ground

Soil type	Moisture content (%)	p ^H
Sandy to sandy loamy	35.8	7.5 (alkaline)

3.2 Habitat

The pond is the only habitat for the turtles. The pond is about 61.27m in width and 94.60m in length. The present area per turtle is:

$$\begin{aligned} \text{Total area of the pond} &= (61.27 \times 94.60) \text{ sq. m.} \\ &= 5796.142 \text{ sq. m.} \end{aligned}$$

$$\begin{aligned} \text{area per turtle} &= \frac{\text{total area}}{\text{total number of turtles}} \\ &= (5796.142/500) \text{ sq. m.} \\ &= 11.59 \text{ sq. m.} \end{aligned}$$

From the calculation, it is conceived that each turtle gets 11.59 sq. m. the area as their territory. But (Fig 1) shows that the number is increasing every year. So if this continues in near future, the territorial area for the turtles will be decreased. So the area needs to be increased and conservation is needed for that.

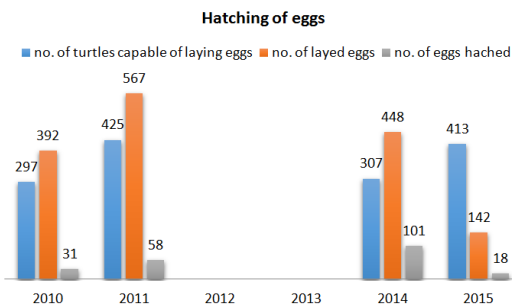


Fig 1: Amount of egg hatched per year (data of the year 2012 and 2013 could not be found).

3.3 Breeding Ground

The breeding ground is situated in a corner of the Mazar. The size of the ground is 300 sq. m. (Table 2) shows the soil properties of the breeding ground of turtles. And Mohammad Ali who is looking after the turtles confirmed that sandy to the sandy loamy soil is perfect for the breeding of these species. The soil pH should not exceed 8 (alkaline). The moisture content of

the soil should be in between 35(m³) to 37(m³). In my study, it is confirmed that the breeding ground is perfect for the breeding of the turtles (Fig 2).



Fig 2: *Nilssonia nigricans* is known as “Mazari”.



Fig 3: The Breeding ground of *Nilssonia nigricans*.



Fig 4: Hazrat Bayazid Bostami Shrine pond (One and only habitat of *Nilssonia nigricans* in Bangladesh).

3.4 Feeding

From (Table 3), it is clearly shown that as the turtles don't need to eat every day, the feeding depends on age. The juvenile turtles need a lot of food. So they need to be fed every day. Adults do not eat every day. They need to be fed 3 or 4 times per week (tortoise trust).

3.5 Basking, Shading and Nesting Facilities

Basking, shading and nesting facilities are important for the turtles. If adequate facilities are not available, turtles will die. These facilities need to be improved in the shrine (Table 4).

Table 3: Feeding analysis of the captivity

Location	Feeding materials	Amount given per turtle per week	Amount need to feed per turtle per week	Feeding per time
		Visitors	Management committee	
Bayazid bostami shrine, Chittagong	Buns, rice, fruits are given by the visitors. Naturally fish and underwater plants are also a source of food	1-1.5 kg	1-1.5 kg	≈ Any time

Table 4: Basking, shading and nesting facilities

Location	Basking facilities	Shading facilities	Nesting facilities	Cleanliness
Bayazid bostami shrine, Chittagong	Edge of the pond is used for basking	Poor. A few trees surrounding the give shade	Not available	Sides of the pond are not so clean. But the pond is clean

3.6 SWOT Analysis

3.6.1 Strength

- Conserve biodiversity at the species level
- Adequate food and care
- Sustainability (funds, maintenance)

3.6.2 Weakness

- Unscientific management
- Overfeeding causes negative effects on fertility etc.
- Repeated disturbances by visitors

3.6.3 Opportunities

- An alternative option for conserving biodiversity
- Local support
- Increased monitoring and care is possible due to the financial efficacy

3.6.4 Threats

- Changes in human belief
- Limited habitat area

4. Conclusion

Conservation of Black Soft Shell turtle (*Nilssononia nigricans*) is needed as it is an important component of the ecosystem and plays a pivotal role in the food chain. Positive habitat environment of black Soft Shell turtle (Mazari) eradicates its immediate possibility of extinction. Instead of this study formulate a new concern to create similar habitat into natural environment so that turtle can go back to their past state and reproduce naturally to create their niche in ecosystem again. And proper management with intensive care will facilitate its conservation and minimize its threats from being lost. What's more, it will also meet the needs of the spiritual beliefs and ecological balance.

References

- Ahsan et al. (1991). Observations on *Aspideretes nigricans*, a semi-domesticated endemic turtle from eastern Bangladesh. *Amphibia-Reptilia*, 12: 131-136.
- Ahsan MF and Saeed MA (2009). Bostami turtle no longer endemic only to Bangladesh. *Tigerpaper (Bangkok)*, 36(2): 29-32.
- Fritz U and Peter H (2007). "Checklist of Chelonians of the World". *Vertebrate Zoology*, 57(2): 311.
- Groombridge B (1982). The IUCN Amphibia-Reptilia Red Data Book. Part 1. Testudines, Crocodylia, Rhynchocephalia. Gland: IUCN.
- Hilton-Taylor C (2000). IUCN red list of threatened species. Gland and Cambridge: IUCN.
- <http://myfwc.com/wildlifehabitats/profiles/reptiles-andamphibians/reptiles/turtles/freshwater-turtles/> Access date: 31/10/2015.
- http://news.bbc.co.uk/2/hi/south_asia/3709059.stm Access date: 31/10/2015.
- <http://nytt.org/proceedings/sarker.htm/> Access date: 31/10/2015.
- <http://whitleyaward.org/winners/conservation-of-fresh-water-turtles-of-mahanadi/> Access date: 31/10/2015.
- http://www.diffen.com/difference/Tortoise_vs_Turtle Access date: 31/10/2015.
- <http://www.iucnredlist.org/details/2173/0>.

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<http://www.livescience.com/52361-turtle-facts.html> Access date: 31/10/2015.

<http://www.tortoisetrust.org> Access date: 31/10/2015.

<http://www.turtleconservationfund.org/grants/> Access date: 31/10/2015.

Meylan PA (1987). The phylogenetic relationships of soft-shelled turtles (family: Trionychidae). *Bulletin of the American Museum of Natural History*, 186: 1-101.

Mukul *et al.* (2012). The role of spiritual beliefs in conserving wildlife species in religious shrines of Bangladesh, *Biodiversity*, 13(2): 108-114.